Cannock Chase District Council

Environmental Protection Act 1990, Part 2A: Exploratory Site Investigation

Former landfill site off East Cannock Road, Hednesford

October 2011

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1 INTRODUCTION

1.1 Terms of Reference

In January 2010, Grontmij Limited (Grontmij) was appointed by Cannock Chase District Council (the Council) to assist in the implementation of the Council's Part 2A Contaminated Land inspection strategy. Part 2A of the Environmental Protection Act 1990 (Part 2A) requires each local authority to inspect areas of land which it believes may constitute Part 2A Contaminated Land.

Contaminated Land is defined in Section 78(2) of Part 2A of the Environmental Protection Act 1990 as:

"any land which appears to the local authority in whose area the land is situated to be in such a condition, by reason of substances in, on or under the land, that

- *significant harm is being caused or there is a significant possibility of such harm being caused; or*
- *pollution of controlled waters is being, or is likely to be, caused".*

Further information is provided in the Act and associated statutory guidance (DEFRA Circular 01/2006 – EPA 1990, Part 2A: Contaminated Land).

Grontmij worked with the Council to prioritise a list of sites which could constitute Part 2A contaminated land for inspection, on the basis of the Council's Part 2A Inspection Strategy. The site subject to this report, located off East Cannock Road, Hednesford. Staffordshire (hereafter referred to as 'the site') was identified as a priority for inspection as:

- The site comprises an area of land which appears to have been infilled with waste material
- The site is considered to be sensitive as:
    - approximately 400 residential properties with gardens and a large area of open space overly the inferred extent of landfill
    - the site is partially underlain by a principal aquifer, and
    - a surface watercourse is present on site.

Following the completion of a desktop study (see Appendix A) and a successful application for funding from DEFRA, Grontmij was subsequently appointed by the Council to implement a site investigation, which was undertaken in September 2010. Following a review of the investigation findings, supplementary fieldwork was undertaken in May to July 2011, as included in Sections 3 and 4.

This report presents the findings of the Exploratory Investigation, assesses the significance of the contaminant concentrations detected, and makes recommendations for further work.

This report is subject to the limitations presented in Appendix B.

2 BACKGROUND INFORMATION

2.1 Site Setting

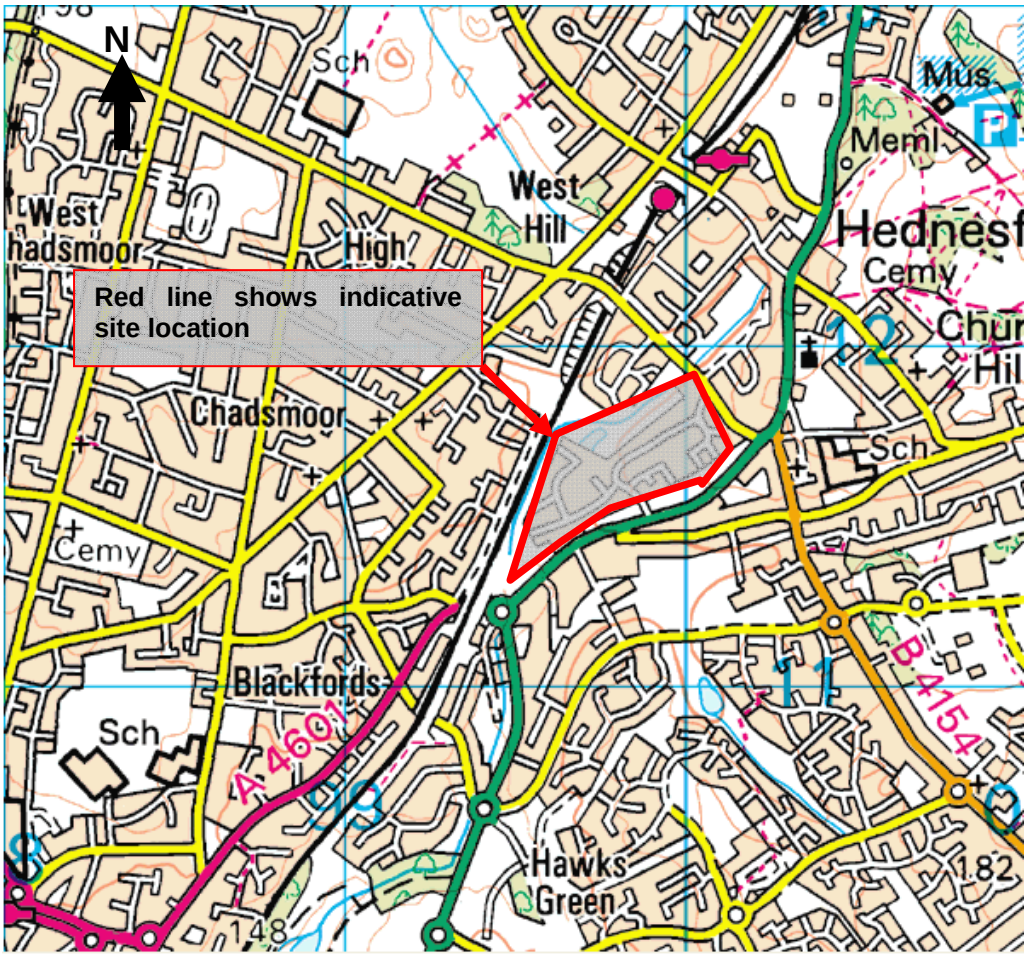
The site's setting and location are summarised in Table 2.1 and Figure 2.1.

Table 2.1 - Site Setting

Data	Information
Address	Infilled ground off East Cannock Road, Cannock, Staffordshire. Nearest postcode is WS12 1UE.
Current site use:	Predominantly comprises residential houses and gardens with grass covered public open space. A leisure centre and public house are located in the south western corner of the site.
Grid Reference:	Located around 399822, 311597
Site Area:	Approximately 18 Ha
Topography:	Prevailing gradient is down towards the north west, although the southern fringe of the site slopes down to the south
Surrounding land use	Industrial estate to the south west (downgradient of the site), residential housing with gardens and open space to the south east, north and west. Schools located approximately 20m to the east 120m to the north and 120m to the west
Geology	The British Geological Survey (BGS) 1:63,360 map sheet 154 (Lichfield) indicates that alluvium superficial deposits underlie the centre of the site and glacial sand and gravel underlies the north-eastern corner of the site, whereas the BGS website Geoindex tool suggests that Glacial Till (Diamicton) underlies the southern half of the site. The likely thickness of deposits is not stated. The BGS map sheet and Geoindex indicate that the underlying solid geology comprises the middle coal measures, with Triassic sandstone deposits beneath the north-eastern corner of the site.
Hydrogeology	The north-eastern corner of the site is classified as a principal aquifer, which is likely to be within the Triassic Sandstone. Principal aquifers potentially yield large amounts of water for abstraction, and are thus the most sensitive units in terms of groundwater vulnerability. The coal measures, glacial sand and gravel and alluvium are normally regarded as secondary aquifers.
Coal mining	Within a coalfield area. For background purposes only, given the age of the report: a Coal Authority ground stability report obtained by the Council in October 2000 indicates the following: • The site is within the likely zone of influence from workings at 90 – 320m depth which ceased in 1957. Any movement associated with these workings is likely to have ceased (and, subsequently, is unlikely to have re-commenced as it is unlikely that coal workings have been undertaken at / near the site since 2000) • As of 2000, there were no known coal mine entries within, or within 20m of the boundary of the site, and; • As of 2000, at the surface, there were no known faults or other lines of weakness caused by coal mining that have made the site unstable.
Source Protection Zones (SPZs)	The Environment Agency website indicates that the north-eastern corner of the site lies within Zone 3 (outermost zone) of a SPZ. Such SPZs indicate an area of groundwater around a potable abstraction borehole, within which the Environment Agency is likely to place a heightened onus on groundwater quality. ***The nearest abstraction well is approximately 4km to the north east***
Surface Waters	Ridings Brook, flowing north east to south west and a pond are located in the north western half of the site. A further stream is located 150m to the south. Further ponds are located 200m to the north, 500m to the south, 675m to the south east and 950m to the north

Data	Information
Historical Land Use	On site: the data provided and information held on the Environment Agency's "What's In Your Back Yard" website indicates that the site was formerly occupied by East and West Cannock Collieries, with principal opencast workings / cuttings for rail lines and slag heaps in the south and western parts of the site. The site became a landfill site, becoming filled prior to the mid-1970s and subsequently being developed as residential housing / public open space in the 1970s and 1980s. There is no information about the site's license, operational period or the date the site was developed. Surrounding area: there are numerous other historic colliery workings and landfill sites within 1km of the site, the closest of which is located adjacent to the northern boundary of the site. Further sites are located 50m to the south, 75m to the south west and 150m to the north east. All are recorded as having received household waste, and last received waste 50 or more years ago.

Figure 2.1 – Site Location



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Plan is not to scale.

2.2 Previous Reports

Grontmij has previously completed a desktop assessment of the site, as presented as Appendix A. The assessment included the review of information available from, on-line data resources, in-house mapping and records provided by the council including details of a previous site investigation, and a site walkover.

The Desk Study report included an initial Conceptual Site Model (CSM) of potential pollutant linkages, developed in accordance with the model procedures[1], and statutory guidance[2]. The CSM is re-presented as Table 2.2 overleaf.

[1] CLR11 Model Procedures for the Management of Land Contamination (EA & DEFRA September 2004)
[2] DEFRA Circular 02/2006, Environmental Protection Act 1990: Part 2A Contaminated Land:, September 2006.

Table 2.2 - Potential Pollutant Linkages

No.	Receptor	Contaminant(s)	Pathway(s)	Risk of Pollutant Linkage Being Realised	Comments
Human Health					
1	Residents of properties above infilled ground – including children playing in gardens & vegetable consumption	Contaminants including (but not limited to) metals, hydrocarbons, PAHs, VOCs, SVOCs within the made ground.	Direct ingestion/dermal contact/inhalation of dust/inhalation of vapours/consumption of home-grown vegetables	Medium to high risk	Existing logs suggest presence of landfilled material and evidence of contaminants beneath study site; testing carried out to date is not extensive. Properties are constructed directly above a potentially significant contamination source.
2	Residents of properties above infilled ground	Methane and carbon dioxide from decomposition of deleterious elements of the made ground.	Movement into buildings, subsequent asphyxiation and explosion risk.	Medium to high risk.	Site likely to overlie infill but no gas monitoring has been undertaken. Investigation and monitoring required to determine risk.
3	Children playing on recreation land	Contaminants including (but not limited to) metals, hydrocarbons, PAHs, VOCs, SVOCs within the made ground	Direct ingestion of soil /dermal contact with soil /inhalation of dust/inhalation of vapours	Medium to high risk	Recreational land overlies landfilled material (as per housing)
Property					
4	Subsurface services serving the buildings (principally water supply)	Contaminants including (but not limited to) metals, hydrocarbons, PAHs, VOC, SVOCs within the made ground	Chemical attack and tainting of water supply could occur at high contaminant concentrations / severe pH levels	Medium to high risk.	Risk suggested by existing data; will depend on depth and concentration of contaminants and material(s) used for water pipes.
5	Property (Structures) – sub-surface concrete	Sulphate and pH	Contact between contaminants and concrete	Medium risk	Possible risk but could only reasonably be established if concrete class used to construct buildings can be established (unlikely) –more relevant for any new planned buildings.
Controlled Waters					

No.	Receptor	Contaminant(s)	Pathway(s)	Risk of Pollutant Linkage Being Realised	Comments
6	Major aquifer (& SPZ) and minor aquifer beneath site	Contaminants including metals, hydrocarbons, PAHs, VOCs and SVOCs within the made ground	Leaching of chemicals to aquifers	Medium risk	Risk will depend upon depth and concentration of contaminants, presence/absence of low permeability layers between contaminants and the aquifers, leaching potential etc. Site data needed.
7	Surface waters (closest is Ridings Brook and pond on site then a further stream 150m to the south and a pond 200m to the north)	Contaminants including (but not limited to) metals, hydrocarbons, PAHs, VOCs and SVOCs within the made ground	Groundwater flow in permeable strata which are in continuity with watercourses	Medium risk	Risk depends on depth/presence of contaminated groundwater, hydraulic gradient within any impacted groundwater unit, and continuity between impacted groundwater and watercourse. Site data needed.

3 EXPLORATORY INTRUSIVE INVESTIGATION

In order to further examine the potential pollutant linkages identified in Table 2.2, and following a successful application for DEFRA funding, an exploratory site investigation was undertaken between the 20th September and 4th October 2010. This section describes the site investigation undertaken and results obtained.

3.1 Scope and Methodology

The scope of the exploratory intrusive site investigation included the following:

- A consultation exercise with residents living at the site, including a mailshot and a public open evening;
- Obtaining plans of underground services and CAT-scanning proposed drilling locations, using a Radiodetection CAT1 and signal generator;
- Drilling of three boreholes with tracked window sampler (BH1-BH3) to a maximum depth of 6.0m bgl, sixteen hand held window sample holes (WS1 – WS16) to a maximum depth of 5.0m bgl, and eleven hand pits to a maximum depth of 1.0m bgl at the locations shown on Drawing 1:
    - All exploratory holes, which were drilled by Sherwood Drilling Services, were positioned in the gardens of housing / open verge areas located above the extent of infill, as indicated on historical mapping.
    - Positions were selected on the basis of achieving representative coverage of the site.
    - The purpose of the window sample holes was to examine shallow and deeper soil conditions, enable the retention of samples for laboratory testing, and facilitate the installation of 50mm diameter dedicated gas monitoring wells in each borehole;
- Logging soil arisings in accordance with BS5930:1999, and additionally noting any visual or olfactory evidence of potential contamination;
- Retaining representative soil samples of the strata encountered, which were selected on the basis of field observations of potential contamination and achieving good spatial and depth coverage of the site, in accordance with BS10175:2001 (updated in 2011);
- Submitting retained samples to Alcontrol Geochem in cooled coolboxes and under chain of custody documentation, and instructing the analysis of samples;
- Undertaking four initial ground gas monitoring rounds at all 19 wells, using a Geotechnical Instruments GA2000 gas analyser and flow pod, and four follow-up gas monitoring rounds at three targeted monitoring wells, using a Gas Data Limited GFM435 analyser.

Leachate and / or groundwater analyses were not scheduled as the investigation comprised an initial assessment only and mapping indicates that the site is mostly underlain by a Secondary aquifer, i.e. of lower sensitivity.

3.2 Results

3.2.1 Ground Conditions

The ground conditions encountered at the site generally comprised Made Ground over Glacial Deposits, encountered as sand and gravel with some clay and silt content.

Made Ground
Made Ground was encountered to a maximum depth of 5.0m bgl (in WS11 – termination depth for this hole) and was predominantly granular in nature, consisting of interbedded sand, gravel and clay layers and pockets of clay. The gravel content of the Made Ground was variable, and included, burnt shale, coal, quartz, concrete, brick, metal, pottery and clinker.

Glacial Deposits
Encountered across the site, from 0.15m to 4.6m bgl, and proven to borehole termination at a maximum of 5.0m bgl. The Glacial Deposits comprised sands and gravels with some clay pockets and layers. Gravel comprised subrounded to rounded quartz.

Groundwater
Groundwater was encountered in four locations across the site:

Table 3.1 - Groundwater Observations

Exploratory Hole	Groundwater details
BH3	Standing at 1.9m bgl on completion
WS4	Seepage at 3.8m bgl
WS11	Seepage at 1.0m bgl standing at 2.55m bgl on completion
HP8	Groundwater noted at 1.0m bgl

The above findings are discussed further in Section 4 (updated CSM). Logs for all locations, providing full details of the strata encountered, are included within Appendix C.

3.2.2 Adequacy of Investigation Depth and Coverage

Glacial deposits (i.e. natural ground) were proven in 23 of the 30 exploratory holes. Natural deposits were generally encountered at shallower depths towards the north eastern part of the site, with a greater thickness of made ground encountered towards the south west. Natural ground was proven in a number of locations across the site (i.e. boreholes terminated in Made Ground were not clustered together), and the full depth of infill material present is likely to have been assessed. Gas monitoring (Section 3.2.5) is therefore likely to be representative of the body of fill material investigated.

3.2.3 Field Evidence of Contamination

The drilling arisings were inspected for visual and olfactory evidence of potential contamination. A summary of field observations recorded is presented in Table 3.2:

Table 3.2 - Field Evidence of Potential Contamination

Exploratory Hole	Visual and Olfactory Evidence of Contamination
HP4	0.0-0.3m bgl: Fragments of rusted metal noted
HP9	0.25-1.0m bgl: Gravel of clinker within matrix
WS1	0.0-0.3m bgl: Fragments of metal within matrix
WS3	0.65-1.6m bgl: Black staining
WS4	0.6-4.6m bgl: Gravel of clinker within matrix
WS9	0.05-0.35m bgl: Gravel of clinker within matrix
WS11	0.0-4.50m bgl: Gravel of clinker within matrix
WS12	0.3-5.0m bgl: Occasional clinker within matrix
WS15	1.0-2.0m bgl: Rare gravel of clinker
BH1	0.55-1.80m bgl: Cemented colliery waste
BH2	0-0.8m bgl: Gravel of clinker within matrix
BH3	0.7-1.0m bgl: Gravel of clinker within matrix

Gravel of coal and shale was also noted in numerous exploratory holes.

3.2.4 Soil Analysis Results

Forty-eight samples were submitted for laboratory analysis, under chain of custody documentation and within chilled coolboxes, to ALcontrol Geochem of Deeside. ALcontrol is UKAS accredited and holds MCERTS accreditation for most analyses performed. The samples were selected for analysis on the basis of field observations and to achieve good spatial coverage of the site.

Table 3.3 presents a summary of the analysis results. The results have been compared to screening values protective of human health, assuming the receptor is a residential property where plant uptake of contaminants occurs, and the plants (vegetables) are subsequently ingested by humans. The screening values used, in order of preference, comprised:

- 2009 Soil Guideline Values (SGVs) published by the Environment Agency / DEFRA, generated using the Contaminated Land Exposure Assessment (CLEA) model, version 1.04 (now available as V1.06)
- Generic Assessment Criteria (GAC) published by Land Quality Management Limited[1] (LQM) and the Environmental Industries Commission[2] (EIC), or calculated by Grontmij, all using CLEA[3]
- SGVs published by the Environment Agency / DEFRA between 2002 and 2007, calculated using prior versions of the CLEA model. This only applies to lead.
- Dutch Intervention Value for cyanide.

Full analytical testing results are included as Appendix D.

[1] The LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment (2nd Edition). Land Quality Press, 2009
[2] Soil Generic Acceptance Criteria for Human Health Risk Assessment. Environmental Industries Commission / AGS / CL:AIRE, January 2010
[3] EIC used CLEA V1.06, LQM and Grontmij used CLEA 1.04

Table 3.3 - Soil Analysis Results Summary

Determinand	No. of Samples Tested	Minimum Value	Maximum Value	SGV / GAC (using 2.5% SOM where SOM-dependant)[1]	Locations where SGV or GAC are exceeded
Arsenic	42	3.1	31	32	-
Antimony	6	<0.60	1.7	550	-
Beryllium	42	0.22	11	51	-
Boron (water-soluble)	42	<1.0	7.4	291	-
Cadmium	42	0.20	3.9	10	-
Chromium, hexavalent	42	<0.60	<1.2	4.3	-
Chromium, total	42	8.6	33	3000[2]	-
Copper	42	9.2	160	2330	-
Lead	42	10	190	450[3]	-
Mercury	42	<0.14	0.56	170[4]	
Nickel	42	6.7	120	130	-
Selenium	42	<1.0	2.0	350	-
Vanadium	42	12	**100**	75	**WS4 1.65-1.85m bgl and 3.5-3.80m bgl**
Zinc	42	31	1400	3750	-
Cyanide	7	<1.0	<1.0	20	-
Asbestos screen	9	No fibres detected in any sample			
Benzene	27	<0.01	0.03	0.16	-
Toluene	27	<0.01	0.69	270	-
Ethyl Benzene	27	<0.01	0.07	150	-
Xylene	27	<0.01	0.07	98[5]	-
TPH – CWG Hydrocarbons	7	None of the banded aliphatic/aromatic TPH-CWG screening criteria were exceeded. Full speciated results are presented in Appendix D			
Phenols	5	<0.03	0.42	290	-
Volatile Organic Compounds and Semi-Volatile Organic Compounds	13	None at concentrations in excess of GACs (with the exception of PAHs below)			-
Polyaromatic Hydrocarbons (PAHs)	13	Other than the two compounds below, none of the speciated PAH screening criteria were exceeded. Full speciated results are presented in Appendix D			
Benzo(a)pyrene	14	<0.10	**1.6**	0.94	**BH2 0.0-0.65m bgl**
Naphthalene	14	<0.10	**8.6**	3.7	**BH2 0.0-0.65m bgl**

Values presented in mg/kg, correct to two significant figures (screening values presented without any rounding). **Bold values** indicate locations where observed concentrations exceed the screening value.

[1] Forty one samples were tested for Soil Organic Matter (%SOM) content. A minimum value of <0.35% and a maximum of 10.7% were recorded, with a mean of 4.95% and a median of 5.12%. Where dependant upon SOM content, SGVs and GAC generated using a 2.5% SOM value in CLEA have therefore been used in an initial screen, as a representative assessment

2 Value is for trivalent chromium; a screening value for total chromium has not been published. Screening a total chromium laboratory result against a trivalent chromium screening value is a conservative measure. Hexavalent chromium, the form considered to be of greater toxicity, was not detected at a concentration above the detection limit of the laboratory.

[3] Earlier (2002) SGV published by DEFRA. An updated SGV may be published once the EA has evaluated a recent European Food Safety Authority toxicology report and confirmed the approach to be adopted for lead (CLEA may not be used).

[4] Testing results presented represent total mercury, whereas SGV presented is for inorganic mercury. Although the most stringent of the SGVs is for elemental mercury, the Environment Agency SGV for mercury in soil science report SC050021/Mercury SGV indicate that in cases where preliminary risk assessment has not identified a mercury issue at the site or conditions such as peaty or flooded soils then '*For general surface contamination and to simplify the assessment, the SGVs for inorganic mercury can normally be compared with chemical analysis for total mercury content because the equilibrium concentrations of elemental and methyl mercury compounds are likely to be very low*'.

[5] SGV for para-xylene quoted (worst case of the three isomers)

Concentrations of two PAHs (naphthalene and benzo(a)pyrene) and vanadium exceeded the generic screening values adopted.

Moderately elevated vanadium concentrations were recorded within two of a total of 42 samples taken. The two moderately elevated concentrations were recorded in samples taken from >1m depth, and hence both are unlikely to pose a risk to human health during normal use of the site. The samples do, however, indicate a potential source that could pose a risk to controlled waters. This is discussed further in Section 4.

3.2.5 Ground Gas Monitoring

Four rounds of initial ground gas monitoring were undertaken in all 19 wells, using a Geotechnical Instruments GA2000 gas analyser with flow pod. On completion of the monitoring, a further four monitoring rounds were undertaken at three wells (BH02, WS05 and WS09) where moderately elevated carbon dioxide concentrations had been recorded, using a Gas Data Ltd GFM435 analyser. A summary of the maximum gas concentrations and flow rates recorded in each well is presented in Table 3.4, with full monitoring data in Appendix E:

Table 3.4 - Summary of Gas Monitoring Data

Well	Maximum Values Recorded During Monitoring Events:					Worst-Case Gas Screening Value[1] (l/hr)	Situation "A" Characteristic Situation[1]
	Peak CH_4 (%)	*Steady CO_2 (%)*	*Steady CO (ppm)*	*Steady H_2S (ppm)*	*Flow (l/hr)*		
BH01	0	3.8	0	0	0.2	0.0076	CS1
BH02	0	**11.5**	2	0	0.1	0.0115	**Possible CS2 – see below**
BH03	0	4.1	0	0	0.2	0.0082	CS1
WS01	0	3.8	0	0	0.1	0.0038	CS1
WS02	0	3.5	0	0	0.1	0.0035	CS1
WS03	0	3.1	0	0	0.2	0.0062	CS1
WS04	0	2.9	0	0	0.1	0.0029	CS1
WS05	0	**8.8**	0	0	0.1	0.0088	**Possible CS2 – see below**
WS06	0	4	0	0	0.2	0.0080	CS1
WS07	0	4.3	0	0	0.1	0.0043	CS1
WS08	0	3.1	0	0	0.1	0.0031	CS1
WS09	0	**6.2**	1	0	0.4	0.0248	**Possible CS2 – see below**
WS10	0	1.3	0	0	0	0.0013	CS1
WS11	0	2.7	0	0	0.1	0.0027	CS1
WS12	0	2.9	0	0	0.1	0.0029	CS1
WS13A	0	3.2	0	0	0.1	0.0032	CS1
WS14	0.2	2.9	0	0	0.1	0.0029	CS1
WS15	0	4.4	0	0	0.1	0.0044	CS1
WS16	0	2.9	0	0	0.2	0.0058	CS1
Atmospheric Pressure:		12/10/2010	1003 (Steady throughout a whole day of monitoring)				
		26/10/2010	997 (Steady throughout a whole day of monitoring)				
		09/11/2010	988 (Rapid rising trend reported[2] - up to 30mb increase in 48 hrs)				
		23/11/2010	1010 (Steady trend reported[2])				
		31/05/2011	1010 (Rising trend reported[2] – approx 10mb rise in 24 hour period)				
		20/06/2011	1010 (Falling trend reported[2] approx 7mb fall in 24 hours)				
		01/07/2011	1014 (Falling trend reported[2] approx 5mb fall in 24 hours))				
		15/07/2011	1004 (Falling trend reported[2] approx 5mb fall in 24 hours))				

Readings obtained within a 3 minute measurement period, obtained with a Geotechnical Instruments GA2000 and a Gas Data GFM435 gas analyser.
Bold values indicate locations and gases where a characteristic situation other than CS1 is indicated.
CH_4 – methane; O_2 – oxygen; CO_2 carbon dioxide; CO – carbon monoxide;
H_2S – hydrogen sulphide; mbgl – metres below ground level mb – millibars l/hr – litres per hour.
[1]CIRIA Gas Screening Value and Characteristic Situation based on methodology presented in CIRIA Report C665, Assessing Risks Posed by Hazardous Gases to Buildings. Where the flow rate recorded in the field is zero or negative, a flow of 0.1 l/hr is assumed
[2]Trend information taken from pressure observations at weather stations in Coalville http://www.photoweather.com/aws/ and Alvechurch http://alvechurchweather.metsite.com/ . While data from these sites is likely to be reliable, both sites contain a disclaimer that the information provided should not be used for decision making purposes. However, the data is considered likely to be sufficiently reliable to allow general pressure trends in the W Midlands to be determined

The summary data presented above indicates that, in regard to ***methane and carbon dioxide***, CIRIA characteristic situation CS1 should be applied to the majority of the wells. This is the lowest risk category (of six) presented in CIRIA report 665, and indicates that no special gas precautions would be required in the construction of new buildings.

In regard to BH02, WS05 and WS09 - CIRIA report 665, Table 8.5, indicates that the assessor should ***consider*** increasing the applied characteristic situation from CS1 to CS2 if the recorded CO2 concentration is not "typically <5%". The CO2 concentrations recorded on each gas monitoring event (see Appendix E) were as follows:

Table 3.5 – Carbon Dioxide Values Recorded in BH02, WS05 and WS09

Location	CO2 Concentrations							
	Round 1	Round 2	Round 3	Round 4	Round 5	Round 6	Round 7	Round 8
BH02	3.8	10.7	2.7	1.4	10.0	3.0	11.5	11.4
WS05	1.4	8.8	7.8	2.1	5.5	NM[1]	NM[1]	7.3
WS09	4.6	6.2	3.5	2.8	1.4	NM[1]	2.9	2.7

[1] Not Measured – not possible to access the well as gate / house was locked

The above data suggests that the carbon dioxide concentration within WS09 is not "typically above 5%" as quoted in CIRIA665, suggesting that CS1 should apply. This would mean that no special gas protection measures would be required if a new building was constructed at the WS09 location.

The concentrations of carbon dioxide in BH02 and WS05 are "typically above 5%". As discussed above, CIRIA665 indicates that in this situation, the assessor should consider increasing the applied characteristic situation from CS1 to CS2. However, Grontmij considers that CS1 should apply because:

- low gas flow rates were recorded during the monitoring period. This suggests that minimal diffusive flow to the well is occurring, which in turn suggests that there is only a minimal pressure gradient between general ground gas and the well and therefore, generally small volumes of CO_2 in the ground
- some of the monitoring events occurred in favourable gas generation conditions, meaning close-to worst case readings are likely to have been obtained and there is only a low risk that the worst-case condition has not been assessed (see paragraph below),.

Some (three) of the monitoring events were undertaken in periods of falling atmospheric pressure, meaning that observations in favourable (if not optimal) gas generation pressure conditions have been made (optimal conditions being during a rapid fall to a very low pressure). As such, the data obtained is likely to be representative of gas conditions beneath the site during most days in a given year. As the recorded flow rates are very flow, it is unlikely that even optimal gas generation conditions would cause sufficient carbon dioxide (CO_2) to enter the housing at the site to cause health effects (e.g. CIRIA665 Table 2.2 quotes that 3% v/v of CO_2 can cause headaches and shortness of breath).

Although a maximum concentration of 2ppm ***carbon monoxide*** (CO) was recorded during the monitoring period, CO was typically not detected at a concentration in excess of the gas analyser detection limit (of 75 gas readings taken at the 19 wells installed, 2ppm was recorded once and 1ppm once, the remainder of readings being 0ppm). Table 2.2 of CIRIA665 indicates a long-term (i.e. most stringent) occupational exposure limit (OEL) of 30ppm for CO, and a long-term (i.e. most stringent) Environmental Exposure Limit (EAL) of 0.35mg/m^3 (1.15ppm CO). The former of these two values is protective of people in the workplace, the latter of the general public – considered to be a benchmark of protection while not having a statutory basis[1]. Given that CO was typically below the limit of detection, it is unlikely to pose a risk to human health.

[1] The last paragraph of p27 of Environment Agency Horizontal Guidance Note H1 – Integrated Pollution Prevention and Control: Environmental Assessment and Appraisal of BAT (V6, 2003) states that "Although these (EALs) do not carry any statutory basis, they are, again, a benchmark for harm against which any exceedance should be viewed as unacceptable.

Table 2.2 of CIRIA665 indicates a long-term (i.e. most stringent) occupational exposure limit of 5ppm ***hydrogen sulphide*** (H_2S) and a long-term (i.e. most stringent) Environmental Exposure Limit (EAL) of 0.14mg/m^3 (1.39ppm H_2S). Hydrogen sulphide was not detected at a concentration in excess of the gas analyser detection limit during the entire monitoring period, and is therefore unlikely to pose a risk to human health.

3.2.6 Safety of Water Supply Pipes

As a preliminary assessment, soil quality data was screened against WRAS guidelines[1] (current at the time of the exploratory investigation, but now superseded) and UKWIR parameters[2]. This preliminary assessment, included as Appendix G, indicated that the concentration of contaminants in soil could potentially permeate into water supply pipes. The WRAS and UKWIR guidelines are conservative and are normally used for the selection of materials when laying new pipes.

The results of the intrusive investigation and monitoring are discussed in more detail in the following section.

[1] 9-04-03 The Selection of Materials for Water Supply Pipes to be Laid in Contaminated Land. Water Regulations Advisory Scheme, October 2002.
[2] 10/WM/03/21 Guidance for the Selection of Water Supply Pipes to be Used in Brownfield Sites. UK Water Industry Research, 2010 (as re-issued)

4 FURTHER ASSESSMENT OF RISK

4.1 PAHs in Soil, BH02

4.1.1 Introduction

The site investigation has established that the concentrations of benzo(a)pyrene ("b(a)p") and naphthalene in one sample, taken from BH02, exceed the generic screening values applicable to the generic residential housing scenario, where plants are grown for human consumption. The concentrations of contaminants across the site were otherwise less than the adopted SGVs / GAC (elevated concentrations of vanadium at >1m bgl do not pose a risk to human health during normal residential use of the site).

BH02 is located in an area of grassed public open space, between two areas of housing. While exposure to contaminants in open space areas may be less than within residential gardens, particularly as the open space is covered by grass, the identified PAH concentrations in BH02 may nonetheless pose a risk to users of the open space. The PAH concentrations identified in BH02 may also be characteristic of soils within nearby residential properties. Therefore, as a reasonable assumption, GAC based upon exposure in a residential garden have been used in this assessment.

Generic SGVs and GAC are used to examine whether significant possibility of significant harm ("SPOSH" - i.e. unacceptable risk to human health or the environment) ***may*** be posed at any given site in the UK. The SGVs and GAC have been derived using the CLEA model by various parties (see Section 3.2.3), using conservative input parameter values to generate screening values applicable, theoretically, to all UK sites. If contaminant concentrations in soil are below SGVs, significant harm to human health is very unlikely to occur, thus in laymans terms, the SGV approximates to a "safe" contaminant concentration. Conversely, if a SGV or GAC is exceeded by a measured soil contaminant concentration, it does not necessarily mean that SPOSH exists - only that the generic, conservative screening value has been exceeded, and further assessment, normally in the form of statistical analysis of data, is required.

While the intrusive investigation is considered to have achieved representative coverage of the site, the area of open space is currently characterised by only a single exploratory hole and sample (BH02). As the PAH results at BH02 suggest that a localised area of contamination may be present, further samples were required around BH02 in order to further characterise this area of the site, as described below.

4.1.2 Additional Soil Sampling

Five further soil samples (S01 to S05) were obtained on 20th June 2011 from 0.1m to 0.5m depth within a 5m radius of BH02 by means of hand-digging. These samples were characteristic of the shallow made ground, which human users of the site are most likely to encounter.

The strata encountered was generally consistent with that previously observed in BH02, i.e. made ground soils comprising sandy gravelly clay with secondary constituents including ash, clinker and burnt shale encountered in some locations. Summary logs of the hand-dug holes are included in Appendix C.

The samples were analysed for speciated PAHs at Alcontrol Laboratories of Hawarden. The results of the analysis are summarised in Table 4.1, along with the results of the initial analysis from BH02:

Table 4.1 – Summary of PAH Concentrations at / around BH02

Determinand	No. of Samples Tested	Minimum Value	Maximum Value	GAC (using 2.5% SOM where SOM-dependant) [1]	Locations where SGV or GAC are exceeded
Benzo(a)pyrene	6	0.05	1.6	0.94	BH2 0.0-0.65m bgl
Naphthalene	6	0.05	8.6	3.7	BH2 0.0-0.65m bgl
All other PAHs	6	All concentrations <SGV / GAC		various	-

Values presented in mg/kg, correct to two significant figures (screening values presented without any rounding). **Bold values** indicate locations where observed concentrations exceed the screening value.
[1] Forty one samples were tested for Soil Organic Matter (%SOM) content during the exploratory investigation. A minimum value of <0.35% and a maximum of 10.7% were recorded, with a mean of 4.95% and a median of 5.12%. GAC generated using a 2.5% SOM value in CLEA have therefore been used in an initial screen, as a conservative assessment

The additional round of analysis identified low PAH concentrations. Only the original BH02 sample contained PAH concentrations in excess of the GAC adopted.

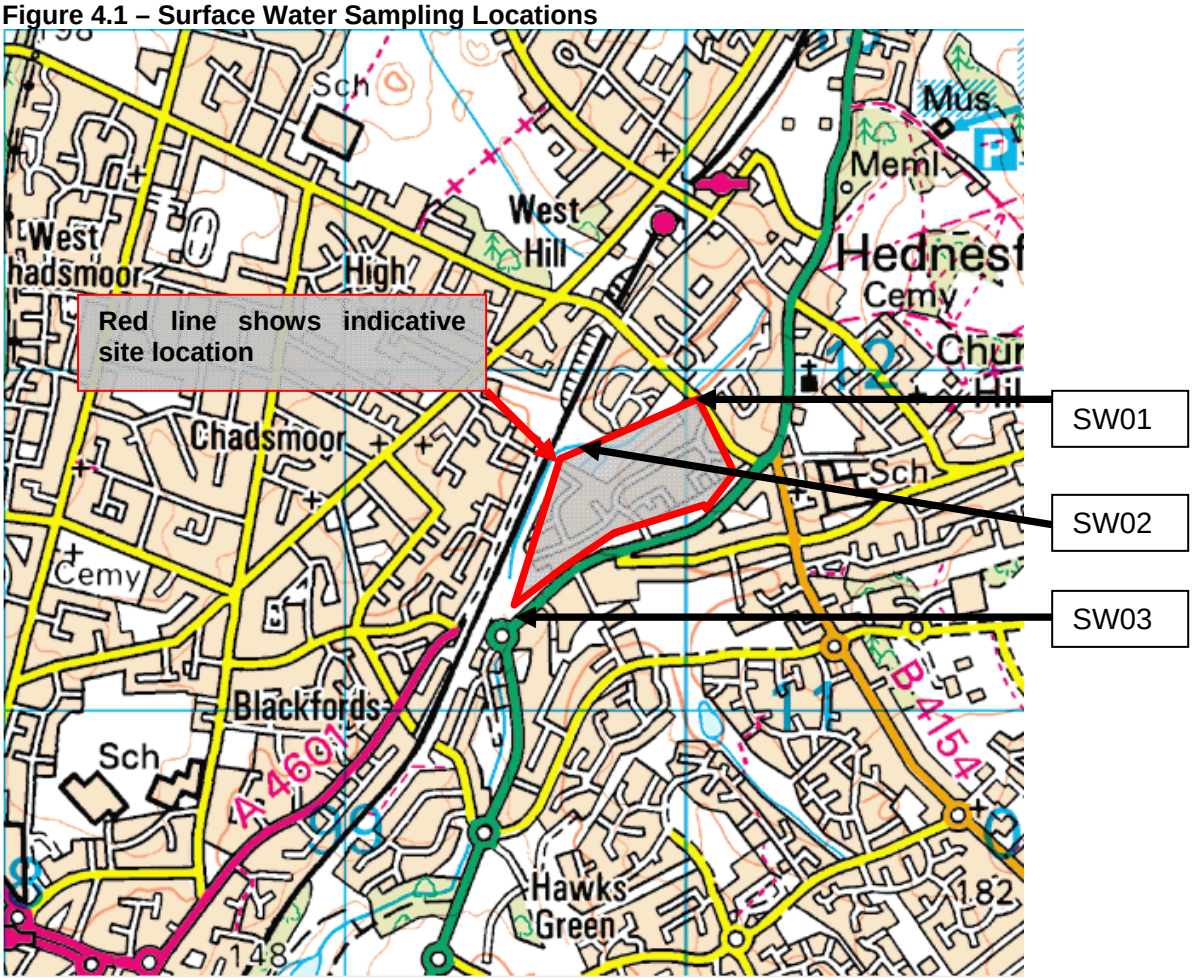
The above results indicate that PAH concentrations in excess of the adopted GAC are confined to a very localised area at BH02. On this basis, it is unlikely that the localised PAHs recorded pose a significant possibility of significant harm to human health.

4.2 Controlled Waters

The exploratory investigation identified concentrations of contaminants in soil that could theoretically pose a leaching risk to controlled waters. As the site is principally underlain by secondary aquifers, groundwater is not considered to be a sensitive receptor beneath the majority of the site (i.e. drinking water is not abstracted), whereas contaminant concentrations above the north-eastern section of the site, above a principal aquifer, were low. Thus, with the exception of the north-eastern corner of the site, discussed below, groundwater is not deemed to require further assessment (see Conceptual Model in Section 5). However, given surface topography, it is possible that dissolved contaminants which have leached to the shallower secondary aquifers could migrate to Ridings Brook and a pond, located within the north-western portion of the site. Therefore, sampling of Ridings Brook was undertaken on 20/06/11 to examine water quality within the brook.

Three samples were obtained from the brook by means of grab sampling. The samples were obtained from an upflow position (SW01 - in order to examine the quality of water entering the site) plus a position midway along the site and at the downgradient site boundary (SW02 and SW03 - to examine the contribution of the site to water quality). Sample locations are shown in Figure 4.1:

Figure 4.1 – Surface Water Sampling Locations



The three samples were submitted to Alcontrol of Hawarden for chemical analysis for chemical analysis for metals and PAHs (i.e. the soil-borne contaminants identified in earlier phases of investigation and/or representing common contaminants for which surface water screening values have been published).

The results of the analyses are summarised in Table 4.2, along with a comparison to the most stringent Tier 1 screening values published in the Water Framework Directive Directions 2010 or UK Environmental Quality Standards protective of surface water quality.

Table 4.2 - Surface Water Analysis Results

Contaminant	No of Samples Tested	Minimum Value µg/l	Maximum Value µg/l	WFD or EQS Tier 1 Screening Value µg/l	Samples >Tier 1 Screening Value
Arsenic (diss.filt)	3	0.62	0.99	25	-
Boron (diss.filt)	3	150	350	2000	-
Cadmium (diss.filt)	3	0.10	0.13	0.15*	-
Chromium (diss.filt)	3	4.5	7.3	7.2	SW03
Copper (diss.filt)	3	2.9	4.8	10*	-
Lead (diss.filt)	3	0.15	0.27	7.2	-
Nickel (diss.filt)	3	<0.15	0.65	20	-
Vanadium (diss.filt)	3	<0.24	<0.24	20-60	-
Zinc (diss.filt)	3	8.1	23	75*	-
Mercury (diss.filt)	3	<0.01	<0.01	0.05	-
PAHs	3	Results below limit of detection (0.03ug/l or below) with exception of following:		Various	-
Naphthalene (aq)	3	<0.10	0.11	1.2	
Fluoranthene (aq)	3	0.02	0.05	No standard	-
Chrysene (aq)	3	<0.01	0.05	No standard	-
Benzo(a)pyrene (aq)	3	<0.01	0.03	0.05	
Pyrene (aq)	3	<0.02	0.06	No standard	-
Benzo(a)anthracene (aq)	3	<0.02	0.04	No standard	-
Benzo(b)fluoranthene (aq)	3	<0.02	0.03	-	-
Benzo(k)fluoranthene (aq)	3	<0.03	0.04	-	-
Sum of above two compounds	-	<0.05	0.07**	0.03	SW01
Benzo(ghi)perylene	3	<0.016	0.0226	-	-
Indeno(1,2,3-cd)pyrene (aq)	3	<0.014	0.0198	-	-
Sum of above two compounds	-	<0.030	0.0424**	0.002	SW01***
Hardness, Total as CaCO3 (mg/l)	3	146 mg/l	254 mg/l	No standard	--

* adopted value selected on the basis of the hardness results, in accordance with the WFD Directions 2010
** Highest value for the paired samples was recorded in the same sample (i.e. summed result is fair)
*** Samples from SW02 and SW03 produced non-detect results of 0.03ug/l. While these values exceed the Tier 1 value, they are not considered further as these results are considered to be acceptably low

The only Tier 1 screening value exceeded is that for total chromium within the downflow sample, SW03. The concentration of chromium recorded is only marginally in excess of the adopted screening value (exceeds by 0.1ug/l). We do not consider that this result represents clear evidence that pollution of controlled waters is being caused by virtue of contaminants beneath the site, nor that contaminants beneath the site pose a SPOSH to controlled waters. However, it is recommended that a repeat sample is obtained in order to understand whether chromium concentrations are stable, increasing or decreasing.

The concentration of “sum of benzo(b)fluoranthene and benzo(b)fluoranthene” and “sum of benzo(ghi)perylene and indeno(1,2,3-cd)pyrene” within the upflow sample, SW01, was in excess

of the adopted Tier 1 screening value, while the concentrations of the above four compounds in the adjacent and downflow samples (SW02 and SW03) were below the laboratory detection limit. These results indicate that there is a minor source of PAH contamination upflow of the site (i.e. from a source other than the site), but the site is not significantly worsening the concentrations of PAHs in Ridings Brook.

October 2011 update: a repeat monitoring visit was undertaken on 6th September 2011, as recommended in the above paragraph. Samples were taken from positions SW01 to SW03 and were submitted to Alcontrol for analysis; all three samples contained dissolved chromium concentrations below the screening value of 7.2ug/l, indicating that dissolved chromium concentrations have decreased since the previous monitoring round. This gives further confidence that the made ground beneath the site is not having a significant adverse effect on surface water quality in the brook. Full details of the monitoring visit are provided in a monitoring memo, included as Appendix H.

4.3 Examination of Drinking Water Quality

Earlier preliminary testing and screening indicated that the concentrations of contaminants in soil could potentially permeate into drinking water supply pipes. As water distribution pipework is typically laid at approximately 1m bgl, with local connections typically shallower, water distribution pipes are likely to be located within made ground. Although some water pipework materials are resistant to contaminant ingress, it is difficult to obtain records of pipework materials used (particularly those installed by builders to connect individual houses to distribution mains), while it may not be possible to determine pipework materials used in the field without performing invasive tests. Therefore, as a pragmatic measure, samples of drinking water quality were taken a residents' taps as a measure of current drinking water quality, and thus contaminant ingress, at the site.

To confirm whether the concentrations of contaminants in the shallow Made Ground pose a risk to drinking water quality at the site, samples of drinking water were collected from taps from five properties (110 Stafford Lane, 41 Swallowfields Drive, 21 Herondale, 8 Stagborough Way and 73 Stagborough Way) on 31st May 2011. The samples were taken from properties where the highest concentrations of contaminants were encountered in soil, i.e. at locations where the greatest risk to drinking water quality may be posed and/or positions allowing good coverage of the site.

As agreed with Cannock Chase Council , samples were obtained after allowing the tap to run for one minute. The samples were submitted to Alcontrol Laboratories for chemical analysis for metals, BTEX and PAHs as commonly occurring contaminants and parameters for which drinking water standards can be applied. The results of the analyses are summarised in Table 4.3, along with a comparison to UK Drinking Water Standards (UKDWS) taken from the Water Supply (Water Quality) Regulations 2000 (as amended). Full testing results are included in Appendix D:

Table 4.3- Tap Water Analysis Results

Contaminant	No of Samples Tested	Minimum Value µg/l	Maximum Value µg/l	UKDWS µg/l	Locations Where UKDWS Exceeded
Arsenic	5	2.0	2.3	10	-
Boron	5	110	140	1000	-
Cadmium	5	0.11	0.28	5.0	-
Chromium	5	11	14	50	-
Copper	5	9.2	120	2000	-
Lead	5	0.12	0.4	10	-
Nickel	5	0.59	15	20	-
Zinc	5	2.7	360	5000	-
Mercury	5	<0.01	<0.01	1.0	-
Sum of Benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, indeno(1,2,3-cd)pyrene*	5	<0.08	<0.08	0.10	-
Benzo(a)pyrene*	5	<0.009	<0.009	0.01	-

*There are no screening values in the WSWQ Regulations 2010 for the remaining commonly analysed 16 PAH compounds

The maximum recorded metal and PAH concentrations within tap water did not exceed the corresponding UK Drinking Water Standards, where standards exist.

The findings of the exploratory investigation, supplementary work and statistical analysis are summarised in an updated Conceptual Site Model, presented in Section 5.

5 UPDATED CONCEPTUAL SITE MODEL

The CSM presented in the earlier Grontmij Desk Study report (Appendix A) was updated, using the findings of the site investigation, as presented in the following sections.

Table 5.1 – Pollutant Linkages, Post-Site Investigation

No	Receptor	Contaminant(s)	Pathway(s)	Potential Severity of Linkage[1]	Probability of Linkage Occuring[1]	Overall Risk[1]	Comments
1	Residents of properties above infilled ground – including children playing in gardens & vegetable consumption	Contaminants including (but not limited to) metals, hydrocarbons, PAHs, VOCs, SVOCs within the made ground	Direct ingestion/dermal contact/inhalation of dust/inhalation of vapours/consumption of home-grown vegetables	Minor	Low	Very low	Other than vanadium, contaminant concentrations within samples taken within residential gardens were below SGVs/GAC. The concentrations of vanadium in two samples taken from WS04 (at 1.65-1.85m bgl and 3.5-3.8m bgl) exceed the SGV. The SGV is a conservative screening value, is only slightly exceeded, and there is no likely exposure pathway given the depth of the contaminant. No further assessment needed in regard to human health – however, concentrations do pose possible risk to controlled waters – see below
2	Residents of properties above infilled ground	Methane and carbon dioxide from decomposition of deleterious elements of the made ground	Movement into buildings, subsequent asphyxiation and explosion risk	Minor	Low	Very low	Gas concentrations generally low across site, either at lowest CIRIA risk class or typically below OEL and EAL. Where moderately elevated CO2 detected, flow rates were low, even in favourable pressure conditions. No further assessment proposed
3	Children playing on recreation land	Contaminants including (but not limited to) metals, hydrocarbons, PAHs, VOCs, SVOCs within the made ground	Direct ingestion of soil /dermal contact with soil /inhalation of dust/inhalation of vapours	Minor (very locally, moderate)	Low	Low	Concentration of benzo(a)pyrene and naphthalene in a single sample (BH02 0.0-0.65m bgl) exceed generic screening values (at up to 2.5 x GAC). Further sampling around BH02 identified low concentrations, indicating affected area is very small and confined to the recreation land only. Hence, PAHs are unlikely to pose a SPOSH to human health. No further assessment proposed
4	Subsurface services serving the buildings (principally water supply)	Contaminants including metals, hydrocarbons, PAHs, VOC, SVOCs within the made ground	Chemical attack and tainting of water supply could occur at high contaminant concentrations / severe pH levels	Minor	Low	Very Low	Various contaminants present in soil at concentrations in excess of WRAS and UKWIR screening values. However, tap sampling identified dissolved concentrations below drinking water standard. No further work proposed

No	Receptor	Contaminant(s)	Pathway(s)	Potential Severity of Linkage[1]	Probability of Linkage Occuring[1]	Overall Risk[1]	Comments
5	Property (Structures) – sub-surface concrete	Sulphate and pH	Contact between contaminants and concrete	Mild	Low	Low	Although a potential risk, concrete attack was not considered to be a priority for intrusive investigation and assessment (i.e. risks to human health and the environment were prioritised). To make a full assessment it would be necessary to expose foundations; likely risk of damage to property and disturbance to residents was considered to outweigh the benefit of exposing foundations for assessment.
6a	Principal aquifer (Triassic Sandstone) beneath north-east corner of site	Contaminants including metals, hydrocarbons, PAHs, VOCs and SVOCs within the made ground	Vertical contaminant migration (leaching) through unsaturated zone directly to Principal aquifer in NE part of site. Leaching to groundwater unit beneath remainder of site and subsequent migration to NE part of site	Medium	Low	Low/Moderate	Moderately elevated vanadium and PAH concentrations were recorded in soil in WS04 and BH02 respectively. However: • BH02 and WS04 are located in the central part of the site, approx 150m west of the mapped extent of the principal aquifer. Migration of unacceptable concentrations of contaminants to the aquifer is therefore unlikely (attenuation to acceptable levels is likely to occur along the theoretical flowpath) • Topography suggests that hydraulic flow towards the north-west is more likely • Contaminant concentrations within infill material directly above sandstone aquifer were not excessively elevated (all < adopted human exposure screening values), suggesting that there is not a significant source of leachable contaminants above the principal aquifer. No further assessment proposed
6b	Secondary aquifers (alluvium and Coal Measures) beneath majority of site	Contaminants including metals, hydrocarbons, PAHs, VOCs and SVOCs within the made ground	Leaching to aquifers	Mild	Likely (in localised areas)	Low / moderate	Moderately elevated vanadium and PAH concentrations were recorded in soil in WS04 and BH02 respectively, drilled above the secondary aquifers. However, the secondary aquifers are of lower sensitivity (drinking water is not abstracted). The potential risk posed by moderate concentrations of contaminants in the Made Ground is not considered to merit further assessment

No	Receptor	Contaminant(s)	Pathway(s)	Potential Severity of Linkage[1]	Probability of Linkage Occuring[1]	Overall Risk[1]	Comments
7	Surface waters (closest are Ridings Brook and a pond on site (to north of housing) then a further stream 150m to the south and a pond 200m to the north)	Contaminants including metals, hydrocarbons, PAHs, VOCs and SVOCs within the made ground	Leaching, then groundwater flow in shallow permeable strata which are in continuity with watercourses	Mild to minor	Low	Low	Moderately elevated vanadium and PAH concentrations were recorded in soil at WS04 and BH02 respectively. Sampling of Ridings Brook identified low metals concentrations with only a very slight exceedance of the Tier 1 value for chromium in the first monitoring round; a follow up monitoring round indicated low chromium concentrations, below the Tier 1 value. PAH concentrations in surface water samples, likely to representative of leachate from the site plus any background levels, were low. Therefore, the site is unlikely to be significantly contributing to the contaminant loading of Ridings Brook.

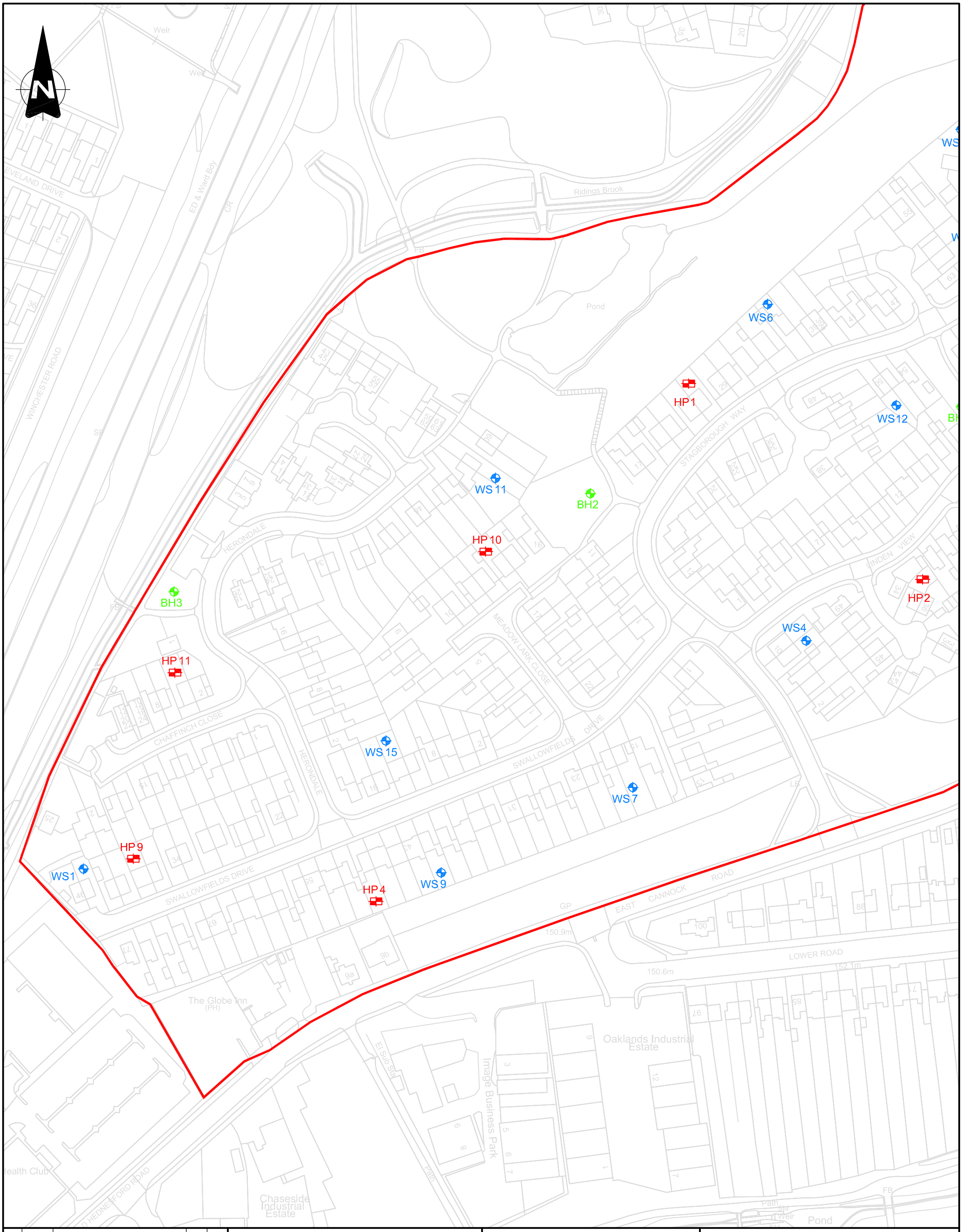
1 Taken from Table 6.3, CIRIA report 552 (Contaminated Land Risk Assessment – A Guide to Good Practice. Severity classified as minor, mild, medium or severe. Probability classified as unlikely, low, likely or high. Overall risk considers both the severity and probability of the linkage (very low, low, moderate, high or very high). See Appendix F for further details

6 SUMMARY AND CONCLUSION

- Review of historical mapping and EA records provided to Cannock District Council, plus anecdotal evidence obtained during public consultation, identified that land off East Cannock road, Hednesford was infilled with unknown waste material which potentially posed a risk to human health and controlled waters.
- An exploratory investigation identified up to 5m of Made Ground over Glacial Deposits. The Made Ground typically comprised sand, gravel and clay layers and pockets of clay; the gravel content including burnt shale, coal, quartz, concrete, brick, metal, pottery and clinker. The Glacial Deposits comprised sands and gravels with some clay pockets and layers.
- The exploratory investigation identified that concentrations of benzo(a)pyrene and naphthalene within one sample of Made Ground exceeded generic human health screening criteria. Upon further sampling, risk assessment and consideration of the conservatism associated with the generic screening values, it was concluded that the concentrations of benzo(a)pyrene and naphthalene beneath the site are unlikely to pose a significant possibility of significant harm to human health.
- As soil-borne contaminants could leach to Ridings Brook, close to the northern site boundary, samples were taken from the brook. Generally low contaminant concentrations were recorded, and the site is unlikely to be causing significant harm to the brook;
- Concentrations of contaminants within made ground exceed the conservative generic screening criteria for contaminant permeation adopted by water companies. Sampling of drinking water at consumers' taps was undertaken to further examine this risk. Acceptable contaminant concentrations were recorded. No further assessment is proposed;
- Generally low gas concentrations have been recorded, and some monitoring events have been undertaken during favourable gas generation pressure conditions. No further assessment is proposed.
- Soil-borne contaminants within soils within the portion of the site above the sandstone aquifer were low. Where higher contaminant concentrations have been recorded in soil, samples were taken a significant distance from the sandstone aquifer and are likely to move away from the aquifer. No further assessment proposed.
- Where higher contaminant concentrations have been recorded in soil, samples were taken above the less sensitive coal measures, which is not used for drinking water supply. No further assessment is proposed.

On the basis of the investigation undertaken and information obtained to date, the preceding assessment and the limitations listed in Appendix B, the site is not considered to constitute 'Contaminated Land' under Part 2A of the Environmental Protection Act 1990.

DRAWINGS



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Drawn:	Checked:	Approved:	Date:
MC	MH	GVT	04/01/11

File Ref : 103912-003 | Drawing No : DRAWING 1

Original Size: 420x297 - A3 | Scale : 1:1500 | Rev : 0

KEY:
- INFERRED EXTENT OF INFILL
- BH1 BOREHOLE
- HP1 HANDPIT
- WS1 WINDOW SAMPLER

Client / Project

Cannock Chase Council

Title

EXPLORATORY HOLE LOCATION PLAN

Drawing Status

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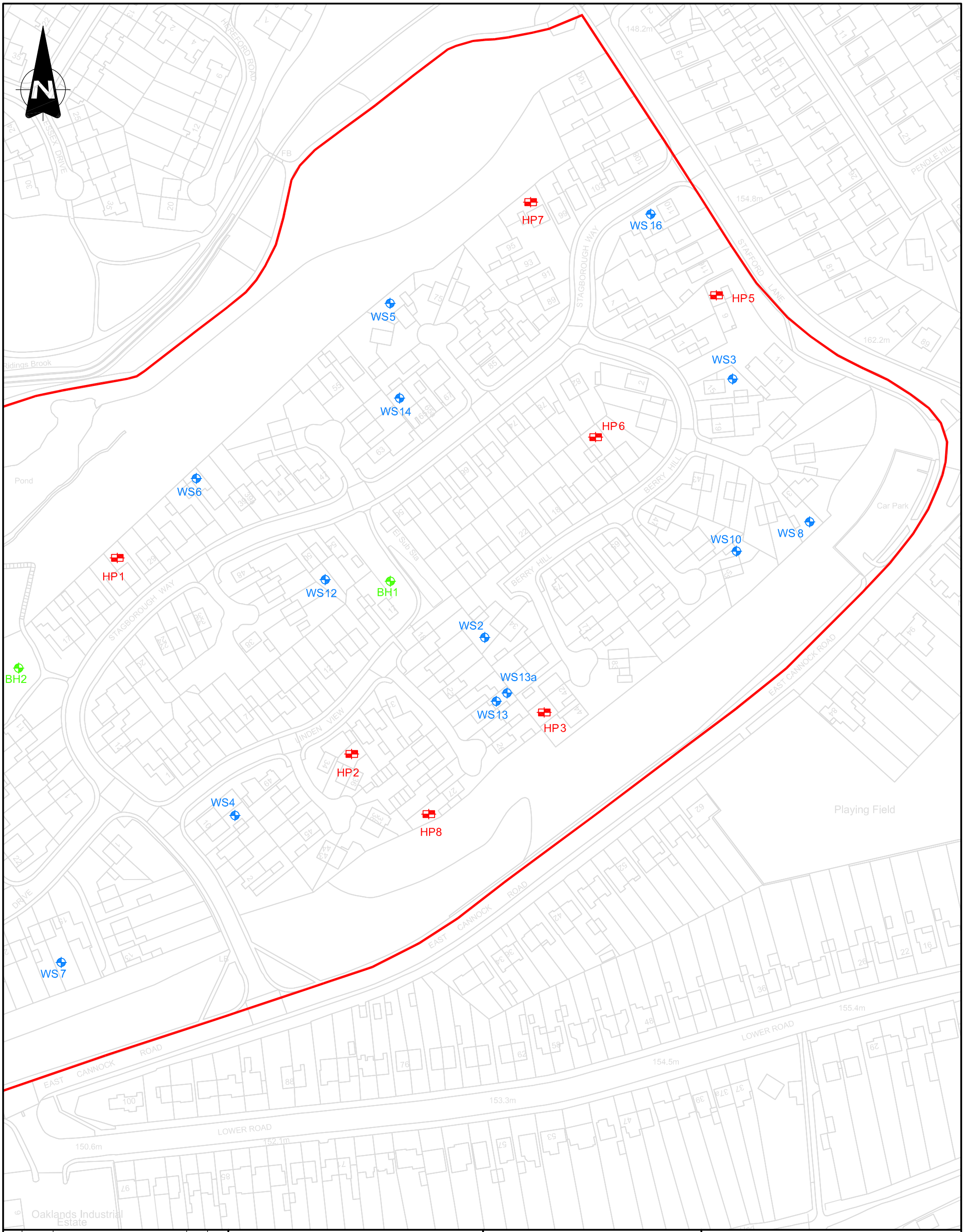

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APPENDIX A

Cannock Chase District Council

Environmental Protection Act 1990, Part IIa: Initial Desktop Study and Walkover

Former landfill site off East Cannock Road, Hednesford

January 2010

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ECR DTS rpt V1	21/01/10	First Issue				
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CONTENTS

FIGURES

TABLES

APPENDICES

1 INTRODUCTION

1.1 Terms of Reference

In January 2010, Grontmij Limited (Grontmij) was appointed by Cannock Chase District Council (the Council) to assist in the implementation of the Council's Contaminated Land inspection strategy. Part IIa of the Environmental Protection Act 1990 (Part IIa) requires each local authority to inspect areas of land which it believes may be Part IIa Contaminated Land.

The scope of work agreed between Grontmij and the Council included:

- Prioritisation of an initial list of potentially contaminated sites for intrusive investigation work, based upon the sensitivity of each site, using existing limited desktop study data provided by the Council, and
- Production of Desktop Study reports for priority sites, to improve the understanding of the sites and inform the planning of intrusive site investigations.

This report presents the findings of an intrusive investigation at a site located in East Cannock Road , Hednesford.

The site comprises an area of land which appears to have been infilled with waste material. The site is considered to be sensitive as approximately 400 residential properties with gardens and a large area of open space overly the inferred extent of landfill, and the site is underlain by a major aquifer.

This report is subject to the limitations presented in Appendix B.

2 SITE SETTING

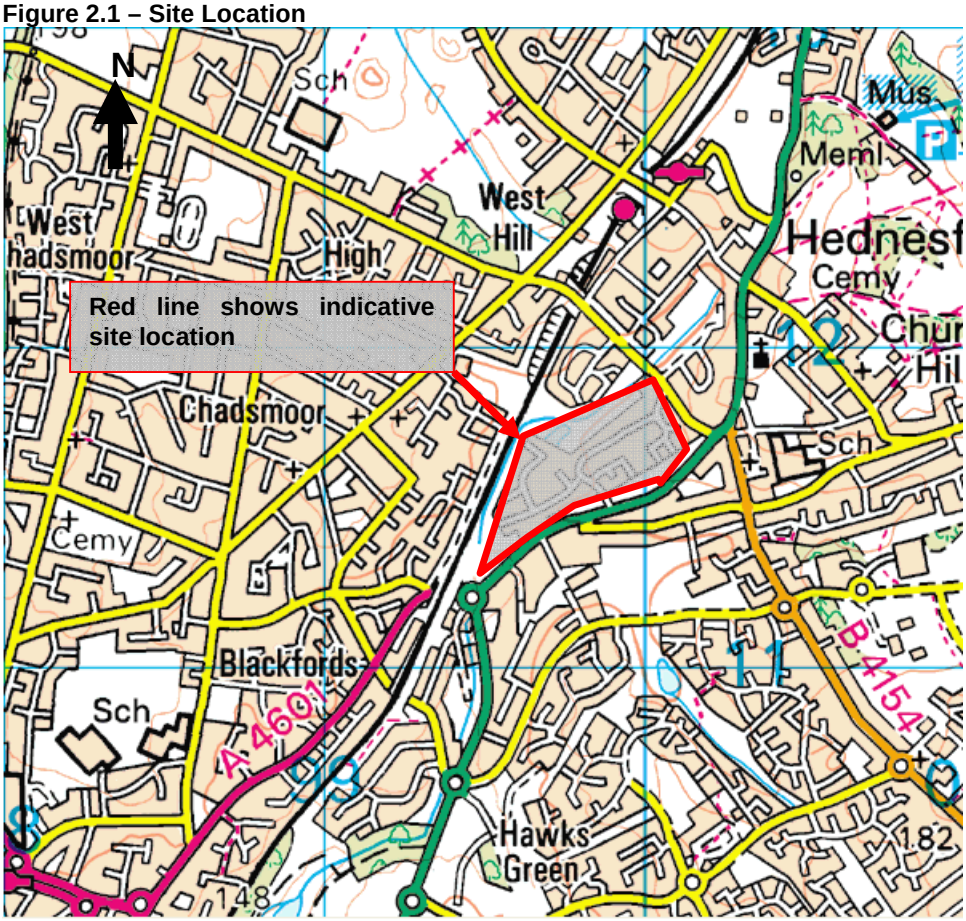
The site's setting and location are summarised in Table 2.1 and Figure 2.1.

Table 2.1 – Site Setting

Data	Information
Address	Infilled ground off East Cannock Road, Cannock, Staffordshire. Nearest postcode is WS12 1UE.
Current site use:	Predominantly residential houses and gardens with grass covered public open space. A leisure centre and public house are located in the south western corner of the site.
Grid Reference:	Located around 399822, 311597
Site Area:	Approximately 18 ha
Topography:	Generally towards the south west and north west
Surrounding land use	Industrial estate to the south west, residential housing with gardens and open space to the south east, north and west. Schools located approximately 20m to the east 120m to the north and 120m to the west
Geology	The British Geological Survey (BGS) 1:63,360 map sheet 154 (Lichfield) indicates that alluvium superficial deposits underlie the centre of the site and glacial sand and gravel underlies the north-eastern corner of the site, whereas the BGS website Geoindex tool suggests that Glacial Till (Diamicton) underlies the southern half of the site. The likely thickness of deposits is not stated. The BGS map sheet and Geoindex indicate that the underlying solid geology comprises the middle coal measures, with Triassic sandstone deposits beneath the north-eastern corner of the site.
Hydrogeology	The north-eastern corner of the site is classified as a major aquifer, which is likely to be within the Triassic Sandstone. Major aquifers potentially yield large amounts of water for abstraction, and are thus the most sensitive units in terms of groundwater vulnerability. The coal measures, glacial sand and gravel and alluvium are normally regarded as minor aquifers.
Coal mining	Within a coalfield area. A Coal Authority ground stability report obtained by the Council in October 2000 indicates the following: • The site is within the likely zone of influence from workings at 90 – 320m depth which ceased in 1957. Any movement associated with these workings is likely to have ceased by now • There are no known coal mine entries within, or within 20m of the boundary of the site • At the surface, there are no known faults or other lines of weakness caused by coal mining that have made the site unstable
Source Protection Zones (SPZs)	The Environment Agency website indicates that the north-eastern corner of the site lies within Zone 3 (outermost zone) of a SPZ. Such SPZs indicate an area of groundwater around a potable abstraction borehole, within which the Environment Agency is likely to place a heightened onus on groundwater quality. The nearest abstraction well is approximately 4km to the north east
Surface Waters	A stream flowing north east to south west and a pond are located in the north western half of the site. A further stream is located 150m to south. Further ponds are located 200m to the north, 500m to the south, 675m to the south east and 950m to the north
Historical Land Use	The data provided and information held on the Environment Agency's "What's In Your Back Yard" website indicates that the site was formerly operated as a landfill site which was infilled prior to 1976 and was subsequently developed as residential housing with some public open space in the 1970s and 1980s. There

	is no information about the site's license, operational period or the date the site was developed. There are numerous other historic landfill sites within 1km of the site, the closest of which is located adjacent to the northern boundary of the site. Further sites are located 50m to the south, 75m to the south west and 150m to the north east. All are recorded as having received household waste, and last received waste 50 or more years ago
Walkover	No evidence of contamination noted – but not surprising, as site has been developed

Figure 2.1 – Site Location



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Plan is not to scale.

3 SUMMARY OF AVAILABLE SITE INVESTIGATION DATA

A summary of existing investigation reports is provided below. The data held by the council is included as Appendix A.

3.1 Scope of Investigation

Two site investigations have previously been carried out on the south western half of the site (Douglas Technical Services on 30th July 1990 and GIP Ltd. on 27th August 1998). The purpose of the investigation carried out by by Douglas Technical Services in 1990 appears to have been geotechnical. The investigation included the following:

- Obtaining plans of underground services and CAT-scanning proposed drilling locations;
- Drilling three cable percussion boreholes (Borehole 1 to 3) to a maximum depth of 15m bgl
- Excavation of nine trial pits (Trial Pit 1 to 9) to a maximum depth of 4m bgl;
- Laboratory analysis

None of the boreholes were installed with monitoring wells.

The purpose of the site investigation carried out by GIP Ltd. was for a combined geotechnical and contamination assessment and included the following:

- Obtaining plans of underground services and CAT-scanning proposed drilling locations;
- Drilling two cable percussion boreholes (BH1 to BH2) to a maximum depth of 7.40m bgl
- Installing combined groundwater and gas monitoring wells in the two boreholes, to intercept any mobile groundwater within potentially contaminated strata and to enable gas monitoring;
- Laboratory analysis, and;
- Carrying out post drilling gas monitoring. The report refers to a programme of landfill gas monitoring taking place but does not specify the number of rounds undertaken.

3.2 Results

3.2.1 Ground Conditions

The ground conditions encountered at the site generally comprised made ground over gravelly sand, over clay.

The Made Ground comprised sand and gravel of mudstone, coal and sandstone down to a depth of at least 5.5m bgl and slightly gravelly silty clay to a depth of at least 4.0m bgl. Slag, ash, metal, glass plastic and timber fragments were encountered in several places. In three of the exploratory holes, ash was encountered down to a depth of 3.80m bgl.

The underlying natural strata comprised gravelly sand interbedded with fine to coarse gravel down to 14m over very stiff silty clay which was proven to a maximum depth of 14.75m bgl. On northern edge of the site, alluvium consisting of soft to firm silty sandy clay was proven to a depth of 3.20m bgl.

3.2.2 Field Evidence of Contamination

A summary of field observations recorded is presented in Table 4.1:

Table 3.1 – Field Evidence of Potential Contamination

Exploratory Hole	Visual and Olfactory Evidence of Contamination
Douglas site investigation, 30th July 1990	
Borehole 1	1.1 – 3.6m bgl: slag
Trial Pit 1	2.8 – 3.3m bgl: timber fragments
Trial Pit 2	1.5 – 4.0m bgl: timber fragments
Trial Pit 4	1.1 – 4.0m bgl: ash
Trial Pit 8	0 – 1.60m bgl wire, plastic and rags
Trial Pit 9	0.10 – 1.60m bgl wire plastic and rags
GIP site investigation, 19th August 1998	
TP5	0 – 2.90m bgl: ceramic fragments
TP6	0 – 1. 0m bgl: clinker metal and fabric
TP6	1.0 – 1.60m bgl: ash

The above observations indicate the presence of infill, and potentially waste, beneath the site. A wide range of contaminants may be present, including (but not limited to) metals, hydrocarbons (including PAHs), VOCs, SVOCs and asbestos.

3.2.3 Analytical Chemistry Results – Soil

Chemical analysis of soil samples was carried out on a selection of samples recovered from the ground investigation carried out by GIP Ltd in July 1998. A summary of analytical testing results is presented below:

Table 3.2 – Analytical Chemistry Results Summary–Soil

Contaminant	No of Samples Tested	Minimum Value	Maximum Value	SGV / GAC using 6% SOM	GAC using 1% SOM value (where lower)	No of exceedances
Arsenic	8	5.2	26	32		None
Beryllium	Not tested	-	-			-
Cadmium	8	0.2	3.3	10		None
Chromium[1]	**8**	**13**	**18**	**4.3**		**8**
Copper	8	30	190	2330		None
Lead[2]	8	22	190	450		None
Mercury[3]	8	0.21	0.95	1	0.17	**8**
Nickel	8	18	110	130		None
Selenium	8	0.30	1.5	350		None
Vanadium	Not tested	-	-	-		-
Zinc	8	93	1200	3750		None
Benzene[4]	Not tested	-	-			-
Toluene[4]	Not tested	-	-	610	120	-
Ethyl Benzene[4]	Not tested	-	-	350	65	-
Xylene[4]	Not tested	-	-	230	42	-
MTBE	Not tested	-	-	n/s	n/s	-
TPH CWG	Not tested	**-**	**-**	various	various	**-**
Total PAHs	8	<0.5	7.2	n/s	n/s	-
Naphthalene	Not tested	-	-	8.7	1.5	-
Benzo(a)pyrene	Not tested	-	-	1.0	0.83	-

Values presented in mg/kg, correct to two significant figures (unless greater level of accuracy is possible from analysis or published as a screening value). Bold values indicate locations where observed concentrations exceed the screening value.

[1] Testing results are for total chromium, whereas quoted GAC is value for chromium(VI). The GAC for chromium(III) is 3000mg/kg
[2] SGV quoted was generated by DEFRA using earlier version of CLEA. A value using the latest version of CLEA is awaited
[3] Testing results are for total mercury. SGV/GAC for elemental mercury are presented (the most stringent of the elemental, inorganic and methyl mercury SGVs)
[4] Value for para-xylene quoted (worst case of the three isomers)
n/s – no standard

3.2.4 Groundwater Monitoring Data

The investigation reports indicate that groundwater strikes were encountered at between 1.4m and 4.3m bgl. Monitoring wells were installed in the three cable percussion boreholes drilled in the GIP ground investigation of 1998. No records of the groundwater monitoring are available.

3.2.5 Analytical Chemistry Results – Groundwater

No results of groundwater analysis were available (if carried out at all).

3.2.6 Ground Gas Monitoring

No records of ground gas monitoring of the installed boreholes are available.

3.2.7 Safety of Water Supply Pipes

The soil quality data obtained has been screened against Water Regulations Advisory Scheme (WRAS) thresholds, above which "special consideration of the material used" for the water pipe should be given. The results of the screening exercise are presented in Table 4.6:

Table 3.3 – WRAS Threshold Screen

Analyte	WRAS Threshold Value (mg/kg)	Maximum Test Result (mg/kg)
Sulphate	2000	Not tested for
Sulphur	5000	<10
Sulphide	250	<10
pH	**<5 or >8**	**Range = 7.5 to 8.2**
Antimony	10	Not tested for
Arsenic	**10**	**26**
Cadmium	3	3.3
Chromium (hexavalent)	25	Not tested for
Chromium (total)	600	18
Cyanide (free)	25	<1
Cyanide (complexed)	250	Not tested for
Lead	500	170
Mercury	1	0.95
Selenium	3	1.5
Thiocyanate	50	Not tested for
Coal Tar	50	Not tested for
Cyclohexane extractable	50	Not tested for
Phenol	5	<0.5
Polyaromatic Hydrocarbons	**50**	**300**
Toluene extractable	50	Not tested for
Petroleum Hydrocarbons	50	Not tested for

The concentrations of some analytes exceed WRAS threshold values. Further investigation of the materials used for water supply pipes at the site, and possibly testing for further analytes, will be required.

The results of the intrusive investigation and monitoring are discussed in more detail in the following section of this report.

3.2.8 Regulatory Liaison

The Council referred a planning application for the site to the Environment Agency in 1999. In its response to correspondence from the Council, the Environment Agency confirmed that the site is located over a former landfill site and had been subjected to recent fly tipping. Therefore, there is the potential of contamination and landfill gas. The EA recommended that a remediation strategy is carried out to protect on-site receptors (controlled waters and humans). A copy of the EA correspondence is included within Appendix A

4 PRELIMINARY CONCEPTUAL MODEL

4.1 Introduction

This section of the report presents a preliminary contaminated land assessment, on the basis of the available desktop data. The assessment presents an evaluation of the potential risks posed, should contaminants be present in the soil or groundwater beneath the site.

In the context of the Environmental Protection Act 1990 (EPA90), the Water Act 2003 and associated guidance[1,2], a preliminary (contaminated land) risk assessment should focus on whether the land at a subject site meets the statutory definition of Contaminated Land. Part IIA of the EPA90, as amended by the Water Act 2003, defines Contaminated Land as:

- ***"any land which appears to the local authority in whose area it is situated to be in such condition by reason of substances in, on or under the land, that:***
- ***significant harm is being caused or there is a significant possibility of significant harm being caused; or***
- ***significant pollution of controlled waters is being caused or there is significant possibility of such pollution being caused***

The procedure for assessing contaminated land involves the development of a Conceptual Site Model (CSM) comprising the assessment of potential Contaminants, Pathways and Receptors.

4.1.1 Sources of Contaminants

The "contaminants" term in the conceptual model has been evaluated by inspection of existing desktop study data provided by Cannock Chase District Council, and a preliminary site walkover. The following potential sources of contaminants have been identified:

- An infilled area of land, demonstrated to contain chromium and mercury concentrations above screening values and which could contain contaminants including (but not limited to) other metals, hydrocarbons, polyaromatic hydrocarbons (PAHs), volatile and semi-volatile organic compounds (VOCs and SVOCs)
- Methane and carbon dioxide gas, from the decomposition of any deleterious material within the made ground or from combustible material within the infill

[1] CLR11 Model Procedures for the Management of Land Contamination (EA & DEFRA September 2004)
[2] DEFRA Circular 02/2006, Environmental Protection Act 1990: Part IIA Contaminated Land:, September 2006.

4.1.2 Receptors

DEFRA Circular 02/2006 defines a Receptor as:

- ***"either (a) a living organism, a group of organisms, an ecological system or a piece of property which (i) is in a category listed in Table A as a type of receptor, and (ii) is being, or could be, harmed, by a contaminant; or (b) controlled waters which are being, or could be, polluted by a contaminant".***

Table 1.1 lists all of the receptors to be considered by a Part IIA or PPS23[3] assessment, and assesses whether the receptors are likely to be present at the site.

Table 4.1 - Potential Receptors

Receptor Type	Receptors	Present (✓ /✖)	Notes
Humans	On-site residents	✓	Residential properties (houses and gardens) above indicative extent of landfill. Assumed to have vegetable patches.
	Construction staff and SI personnel.	X	No known redevelopment proposed
	Future occupants of the site	✓	(level of risk same as current residents so not considered further)
	Off site commercial workers or residents	✓	Possibly exposed to gases migrating off-site through permeable strata
Ecosystems	Any designated ecological system[4], or living organism forming part of such a system	X	Inspection of MAGIC website has identified that the site does not lie within, or within 250m of, an ecologically designated site
Property (Flora and Fauna)	Crops, including timber	X	Not present
	Produce grown domestically, or on allotments for consumption	✓	Vegetables grown in residential gardens.
	Livestock	X	Not present
	Other owned or domesticated animals	✓	Pets in residential properties.
	Wild animals which are the subject of shooting or fishing rights	✓	Fish may be present in on site stream and pond
Property (Buildings & Structures)	A 'building' means any structure, including any part below ground level, but does not include plant or machinery within a building.	✓	Residential houses above indicative extent of landfill.
	Coastal waters	X	

[3] Planning Policy Statement (PPS) 23: Planning and Pollution Control, Annex 2: Development on Land Affected by Contamination
[4] Includes sites designated as SSSI or National Nature Reserve by the Wildlife and Countryside Act 1981, Special Area of Conservation (including candidate sites), Special Protection Area or Ramsar Site by the Conservation (Natural Habitats etc) Regulations 1994, and Local Nature Reserve by the National Parks and Access to the Countryside Act 1949.

Receptor Type	Receptors	Present (✓ /×)	Notes
	Inland Freshwaters	**X**	Stream and pond within site boundary; further stream and pond 150m to the south and 200m to the north respectively.
	Groundwater	✓	Major aquifer and SPZ3 beneath north-east corner of site; remainder minor aquifer

[1] as defined in the Water Resources Act Section 104. Generally includes most surface water bodies excluding drains which discharge into sewers.

4.1.3 Pathways

DEFRA Circular 02/2006 defines a Pathway as:

- ***"one or more routes or means by, or through, which a receptor: (a) is being exposed to, or affected by, a contaminant; or (b) could be exposed or affected"***

Pathways are examined as part of Table 3.2, overleaf.

4.1.4 Potential Pollutant Linkages

The pollutant linkages identified are also presented in Table 3.2.

Table 4.2 - Potential Pollutant Linkages

No.	Receptor	Contaminant(s)	Pathway(s)	Risk of Pollutant Linkage Being Realised	Comments
Human Health					
1	Residents of properties above infilled ground – including children playing in gardens & vegetable consumption	Contaminants including (but not limited to) metals, hydrocarbons, PAHs, VOCs, SVOCs within the made ground.	Direct ingestion/dermal contact/inhalation of dust/inhalation of vapours/consumption of home-grown vegetables	Medium to high risk	Existing logs suggest presence of landfilled material and evidence of contaminants beneath study site; testing carried out to date is not extensive. Grass and/or topsoil coverage likely to mitigate risk to an extent – risk is greatest where possibly impacted soils are exposed or could be encountered, for example, when digging a vegetable patch or when children play outdoors. Properties are constructed directly above a potentially significant contamination source.
2		Methane and carbon dioxide from decomposition of deleterious elements of the made ground.	Movement into buildings, subsequent asphyxiation and explosion risk.	Medium to high risk.	Site likely to overlie infill but no gas monitoring has been undertaken. Investigation and monitoring required to determine risk.
3	Children playing on recreation land	Contaminants including (but not limited to) metals, hydrocarbons, PAHs, VOCs, SVOCs within the made ground.	Direct ingestion of soil /dermal contact with soil /inhalation of dust/inhalation of vapours (	Medium to high risk	Grass and/or topsoil coverage likely to mitigate ingestion and dermal contact risk to an extent – risk is greatest where possibly impacted soils are exposed or could be encountered, for example, when children play outdoors.
Property					
4	Subsurface services serving the buildings (principally water supply)	Contaminants including metals, hydrocarbons, PAHs, VOC, SVOCs within the made ground.	Chemical attack and tainting of water supply could occur at high contaminant concentrations / severe pH levels	Medium to high risk.	Risk suggested by existing data; will depend on depth and concentration of contaminants and material(s) used for water pipes.
5	Property (Structures) – sub-surface concrete	Sulphate and pH	Contact between contaminants and concrete.	Medium risk	Possible risk but could only reasonably be established if concrete class used to construct buildings can be established (unlikely) –more relevant for any new planned buildings.
Controlled Waters					
6	Major aquifer (& SPZ) and minor aquifer beneath site	Contaminants including metals, hydrocarbons, PAHs, VOCs and SVOCs within the made ground.	Leaching of chemicals to aquifers	Medium risk	Risk will depend upon depth and concentration of contaminants, presence/absence of confining layers between contaminants and the aquifers, leaching potential etc. Site data needed.

No.	Receptor	Contaminant(s)	Pathway(s)	Risk of Pollutant Linkage Being Realised	Comments
7	Surface waters (closest are a stream and pond on site then a further stream 150m to the south and a pond 200m to the north)	Contaminants including metals, hydrocarbons, PAHs, VOCs and SVOCs within the made ground.	Groundwater flow in permeable strata which are in continuity with watercourses	Medium risk	Risk depends on depth/presence of contaminated groundwater, hydraulic gradient within any impacted groundwater unit, and continuity between impacted groundwater and watercourse. .

5 CLOSING REMARKS

Potential pollutant linkages affecting the health of on-site residents, controlled waters, and property have been identified, and therefore an initial intrusive investigation should be carried out to examine the likelihood of pollutant linkages existing at the site.

DRAWINGS

Cannock Chase Council

Site requiring investigation
Off East Cannock Way

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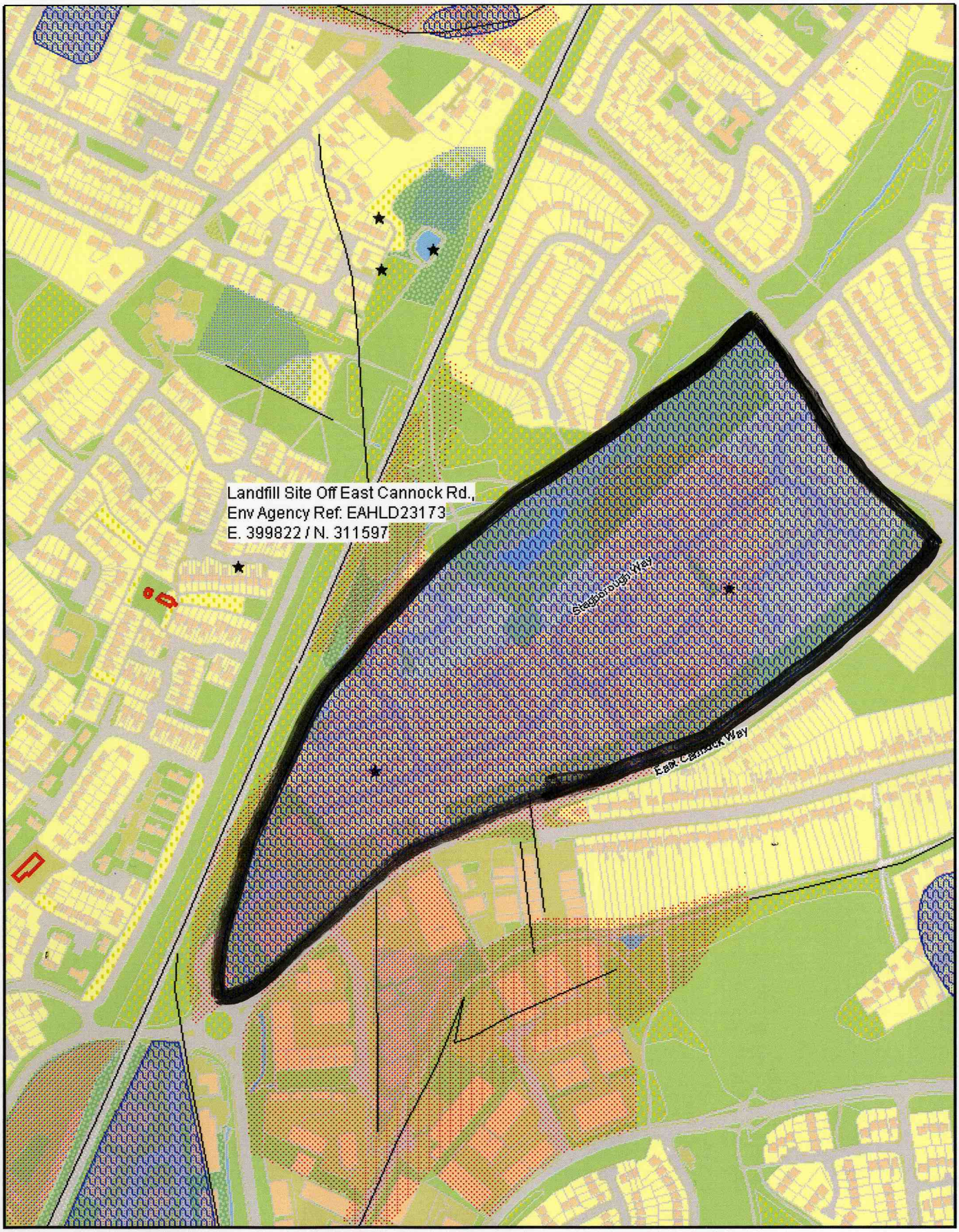

APPENDIX A

Our ref: UT\2000\003998\001
Your ref: CH/00/0512

ENVIRONMENT AGENCY

Date: 18th October 2000

J W Heminsley
Planning & Building Control Manager
Cannock Chase Council
Civic Centre,
P O Box 28,
Beecroft Rd
Cannock
Staffordshire
WS11 1BG

Dear Sir/Madam

PROPOSAL FOR A3 USE FOOD & DRINK & D2 USE ASSEMBLY & LEISURE LAND ADJACENT TO OLD HEDNESFORD RD, CANNOCK

Thank you for referring the above application, which was received on 13 October 2000.

In previous correspondence dated 19 July 1999 responding to this proposal we notified yourselves of the fact that this application site coincides with a former landfill site and as such there is the potential for the site to be contaminated with materials and landfill gas. This area has also been subjected to recent fly-tipping incidents. We note that the application form states that a site investigation has been undertaken. We trust that this site investigation incorporates a remediation strategy, which will protect all the receptors on site including the Ridings Brook and the public using this site.

With regards to the proposed layout of this development we have the following comments to make:

The proposed access culvert indicated on Drawing No. 420:29 will require a consent to be issued by the Agency under Section 23 of the Land Drainage Act 1991.
The length of the culvert indicated on the plan submitted measures 30 metres. The culvert should be constructed over the shortest length possible and not as indicated. The applicant should be aware that the Agency will refuse to issue consent for a culvert of such length which does not conform to the Agency's culverting policy. In this respect we recommended that this Drawing is amended to show a shorter length culvert. This could alter the proposed layout of the site in this area.
To discuss this issue further please contact the Agency's Land Drainage Officer, John Beckett on 01543 404900.

On-site inspections reveal that the corridor along the Ridings Brook is already established. Any further planting in this area should be of native species.

Drainage from the 162 space car park should pass through a petrol inceptor before discharging into the Ridings Brook in accordance with the following condition (if an

interceptor is not installed the applicant will need to apply for a Discharge Consent from the Agency):

CONDITION:
Prior to being discharged into any watercourse, surface water sewer or soakaway system, all surface water drainage from parking areas and hardstandings shall be passed through an oil interceptor designed and constructed to have a capacity and details compatible with the site being drained. Roof water shall not pass through the interceptor.

REASON:
To prevent pollution of the water environment.

Yours faithfully

S Holland

Mr Cliff Dobson
Customer Services Manager

UGLAS

DOUGLAS TECHNICAL SERVICES LIMITED
George Road, Erdington, Birmingham B23 7RZ
Telephone: 021-344 4888 Fax: 021-344 4801 Telex: 338399

CONTRACT NO.25-5540

REPORT ON A PRELIMINARY GROUND INVESTIGATION

CARRIED OUT AT

OLD HEDNESFORD ROAD, CANNOCK

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fs

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FIGURES

1

CARRIED OUR AT
OLD HEDNESFORD ROAD, CANNOCK

1.0 INTRODUCTION

Shervale Developments Limited intend to develop an area of redundant land alongside the Old Hednesford Road between the Hill Top and Stoney Lea districts of Cannock.

In order to determine the likely ground conditions a preliminary site investigation comprising three boreholes and nine trial pits plus associated field and laboratory testing was undertaken. It is intended at a later stage to sink more boreholes in connection with individual structures proposed for the site.

This report presents the findings of the investigation and gives brief comment on engineering properties and foundation design.

The investigation and testing carried out can provide information only in relation to the material encountered in the boreholes and trial pits. Conditions can vary between exploratory holes and the Engineer responsible for design is advised to satisfy himself that the location, quantity and type of investigative work is site.

This report does not purport to give any recommendations whatsoever regarding the behaviour of the ground during construction operations or as a result of any decisions taken by the Engineer before or during construction which may affect or alter the behaviour anticipated of the soils in their natural state.

2.0 SITE LOCATION AND DESCRIPTION

The site is located at the junction of the Old Hednesford Road (A460) and Winchester Road, Cannock which lies roughly midway between the Hill Top and Stoney Lea districts of the town, See Figure 1.

The site is an irregular triangle in shape and bounded to its north-west by the Cannock to Hednesford railway

new housing estate.

A stream known as Ridings Brook flows across the western part of the site in a roughly north-south direction. To the west of the stream the ground is generally flat and covered with scrub vegetation. To the east the average ground level is 1 to 2 metres higher than in the west, but is also generally flat and covered with scrub vegetation. Old Hednesford Road rises from south to north and the site is therefore lower lying than the surrounding ground on all sides except the extreme southern point by the junction with the Cannock Eastern bypass.

From previous work carried out in the area it is known that Coal Mining activity has been undertaken in the vicinity of the site. A British Coal Mining report is included in Appendix I for completeness. However this report does not comment further on the nature, extent or likelihood of mine workings beneath the site.

3.0 GENERAL GEOLOGY

The British Geological Survey sheet No.154 drift edition of Lichfield shows the site to be covered partially by recent deposits of alluvium from the Ridings Brook. Beneath the alluvium and covering the rest of the site are drift deposits of glacial origin. These deposits are thought to be boulder clays with sand and gravel beds. The underlying solid geology is obscured on the map, but is conjectured to be either middle or upper coal measures.

4.0 SITE WORK

i) Shell and Auger Boreholes

Between the 30th July, and 2nd August, 1990 three boreholes were sunk to depths ranging from 14.55m to 15.00m. The location of these boreholes are shown on the site plan, Figure 2.

The boreholes were formed using standard cable percussion boring equipment of 150mm diameter, temporary casing was inserted as a support where necessary. Regular sampling consisting of disturbed 'bulk' bags was undertaken to provide material for detailed examination and testing. In granular and hard material where undisturbed tube sampling was

ner investigation is required across areas of
where the depth of fill and sequence of na
ta has not been proven. From such informati
be possible to assess with greater confidence
t of the peaty materials and confirm
bility of rafts across the whole site.

to determine the risk of attack by sulphate
ground on buried concrete have indicated re
fall into Class 1 conditions as define
10 Part 1, 1985.

ouglas Technical Services Ltd.,

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ee,B.Sc.,
ee Geotechnical Engineer

.....
ushton,B.Sc.,M.Sc.,C.Eng.,MICE
iate Director

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llen,B.Sc.,
tor

40/20th August, 1990

together with the number of four successive 75mm drives which are then summated to give the N value. Where the size of granular material became too coarse the split tube sampler was replaced by a solid 60° apex cone (CPT). Detailed records of boring are given in Figures 3 to 8.

ii) Trial Pits

Nine trial pits were excavated on the 10th August, 1990 using a JCB 3CX machine. The locations of the pits are also shown on the site plan, Figure 2. Following detailed measurement and examination of material encountered, the pits were backfilled with material arising. Detailed records are given in Figures 9 to 17.

5.0 LABORATORY TESTING

In order to make a broad assessment of the engineering properties of the soils sampled during the field work a small schedule of testing was prepared based on preliminary borehole logs and trial pit records.

Standard laboratory tests were performed in accordance with BS.1377 (1975) and the tests may be sub-divided into two groups as follows:-

Group A - General Soil Classification Tests

(a) Particle Size Distribution

(b) Atterberg Limit Determinations

Group B - Chemical Tests

(a) Sulphate and pH Determinations

(b) Dichromate Organic Content

The results of these tests are given in summary as Table I and graphical form where appropriate as Figs. 18 and 19.

6.0 DISCUSSION

6.1 Strata Encountered

Four geological layers of distinctly different

FILL, ALLUVIUM, GLACIAL DRIFT, UPPER COAL MEASURES.

FILL

The first identified layer was the fill which was observed in all boreholes and trial pits.

The composition of the fill found in the boreholes and trial pits can be separated into two basic types. The first type was observed only in the trial pits and can be described as a loose to medium dense grey or black silty sandy fine to coarse GRAVEL of mudstones, coal and shale with ash and occasional cobbles and boulders. Pockets of soft black silty clay were also identified in most trial pits. The second basic type was observed in the boreholes and trial pit 1 and beneath the generally gravelly fill in Trial Pits 6, 8 and 9.

Compositionally the second fill type was typically a soft or very soft grey and black silty clay with fine to coarse gravels of mudstone, coal and shale with peat traces and some organic clay.

The thickness of the fill is variable across the site. The minimum depth observed was 2.30m in Trial Pit 9 and a maximum of 5.50m in Borehole 3. Trial Pits 1, 2, 3, 4, 6 and 7 did not prove the base of the fill and in these areas the depth may exceed 5.50m.

ALLUVIUM

The second identified layer was the alluvium which was observed in Borehole 1 and Trial Pits 5 and 9. In the trial pits this layer was typically a soft brown silty sandy CLAY with some sub-rounded gravels and traces of peat. In Borehole 1, a 0.5m thick layer of dark brown amorphous peat was observed below the fill at a depth of 3.60m.

The thickness of the alluvial clay was only proven in Trial Pit 9 and was found to extend from 2.40-3.00m.

The distribution of the naturally-occurring alluvial clay appears to be fairly sporadic from this preliminary borehole and trial pit information. However, the presence of peat and organic traces towards the base of the fill in Boreholes 2, 3 and within the fill layer in trial pits 1 and 8 suggests that the alluvial clay has been reworked and distributed into the fill and is therefore more wide-

The third identified layer is most probably glacial drift and was observed in all boreholes and trial pits 8 and 9. The glacial drift when encountered was typically a medium dense red-brown very sandy fine to coarse sub-angualr to sub-rounded quartzitic GRAVEL with some beds of red brown fine to coarse SAND and soft to firm red brown silty CLAY.

The thickness of this layer was only proved in the boreholes and was found to be a minimum of 8.4m in Borehole 3 and a maximum of 10.4m in Borehole 2. The depth to the top of this layer where encountered ranged from 3.0m in Trial Pit 9 to 5.50m in Borehole 3.

UPPER COAL MEASURES

This stratum, which is thought to form the solid geology of the site was only encountered in the boreholes, being too deep for the trial pits.

In Boreholes 1 and 2 the solid geology was typically a very stiff to hard red-brown mottled grey silty CLAY with fine angular lithorelicts. In Borehole 3 a fresh red-brown fine-grained CONGLOMERATE, moderately strong, was encountered at the bottom of the hole. The clay was encountered at 13.90m in Boreholes 1 and 3 and at 14.20m in Borehole 2.

6.2 Groundwater

Groundwater was encountered in all boreholes and in Trial Pits 1, 2, 3, 4, 7, 8, 9. The groundwater in the boreholes was generally encountered at the top of the Glacial Drift rising to between 3.20m and 3.60m below ground level. In the trial pits seepage occurred from the fill at depths ranging from 1.60m to 4.00m. Particularly strong inflows of water were observed in Trial Pits 1, 3, 2 and 9.

6.3 Foundations

It is considered that the fill in its present state, and the underlying soft alluvial and peaty clays directly beneath it, are not suitable for conventional strips or pad foundations. This is due to the risk of excessive settlement associated with its loose and very soft state, and the substantial long term settlement associated with the degradation and compression of

and detail of the specific development proposed together with a more detailed analysis of the ground in specific areas. These are piled foundations, vibroflotation and raft foundations.

(a) Piles

Probably the best foundation solution from an engineering point of view would be to found the structures on (driven) piles which bear into the glacial drift and underlying solid strata. This solution is particularly appropriate where deep fill is overlying significant thicknesses of peaty material. However, the economics of this method are unlikely to be attractive unless the structures are large.

(b) Vibroflotation

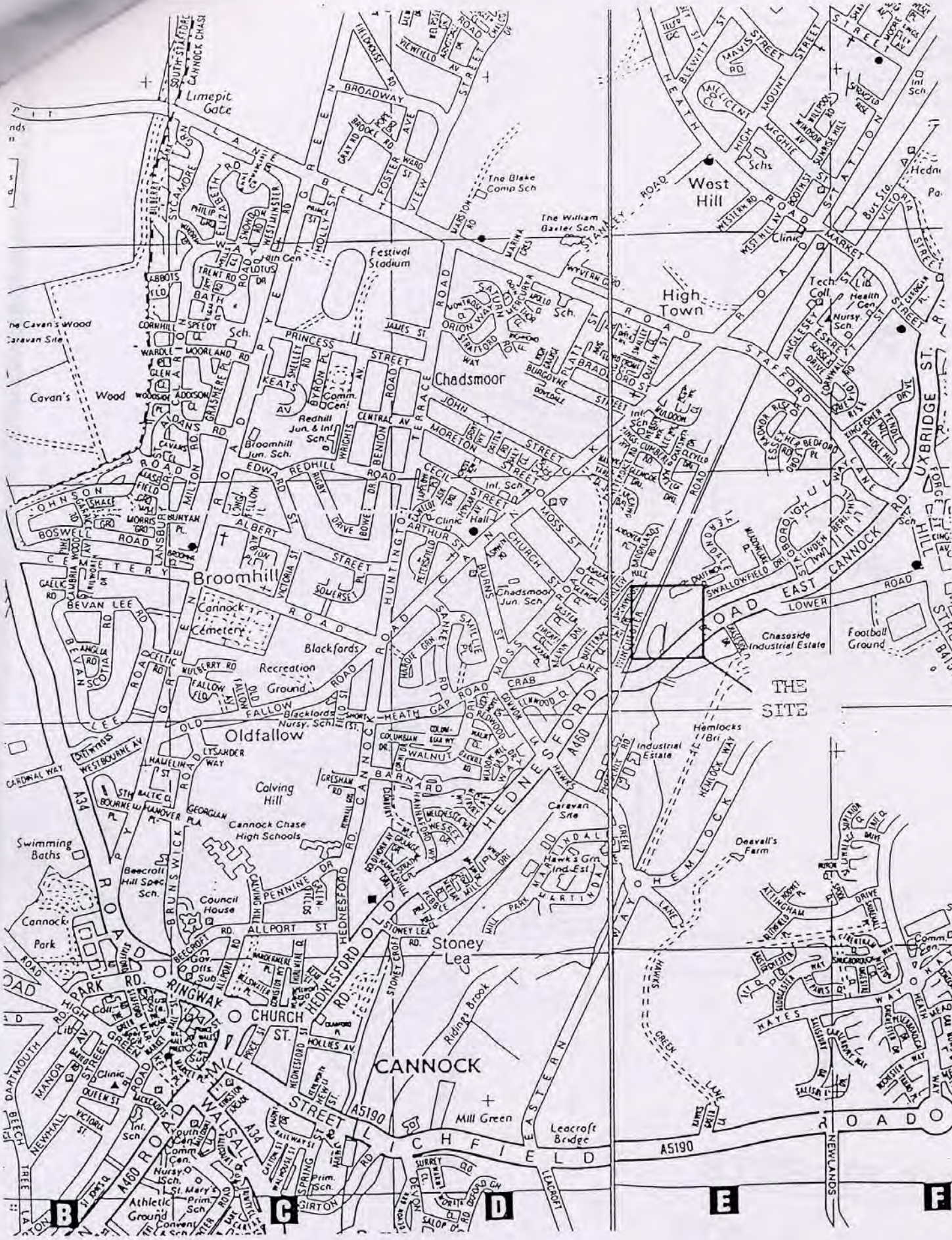
An alternative to a piled foundation would be to improve the ground by means of vibro-replacement stone columns. This method could be used to increase the strength and density of the fill and underlying soft alluvidal clays allowing conventional strip and pad foundations to be used. However the depth of fill and soft material proved by the boreholes and trial pits may limit the suitability of this method in some areas. Further investigation would be required to prove the depth of fill and the succession of natural strata to determine the suitability of this method across the whole site.

If either vibro-replacement or piling solutions are to be considered further, the advice of specialist contractors should be sought for specific design parameters.

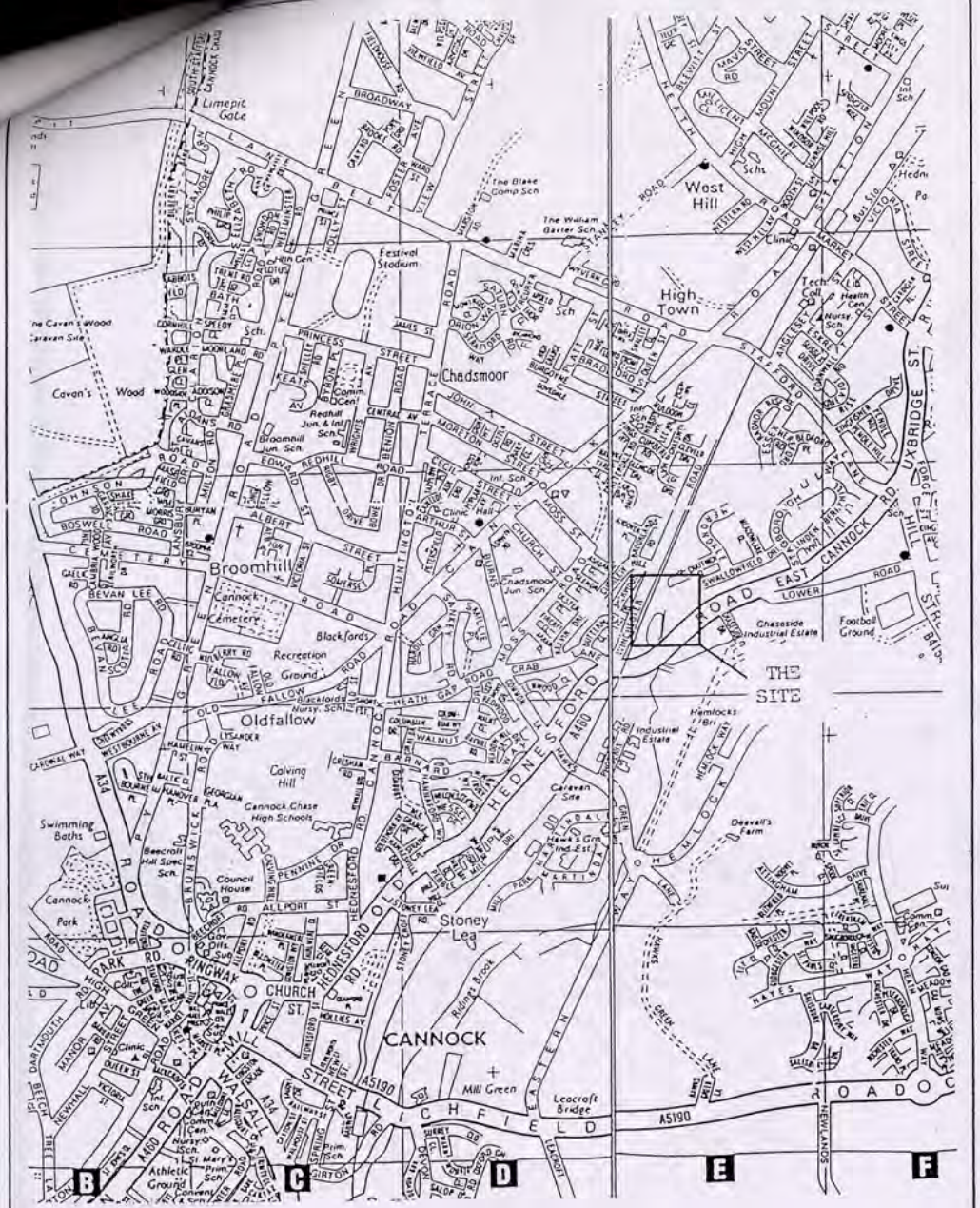
(c) Rafts

Another option would be to consider a raft foundation design for low rise buildings, however, the use of this method is restricted by the distribution of the peaty and organic materials found within and underlying the fill.

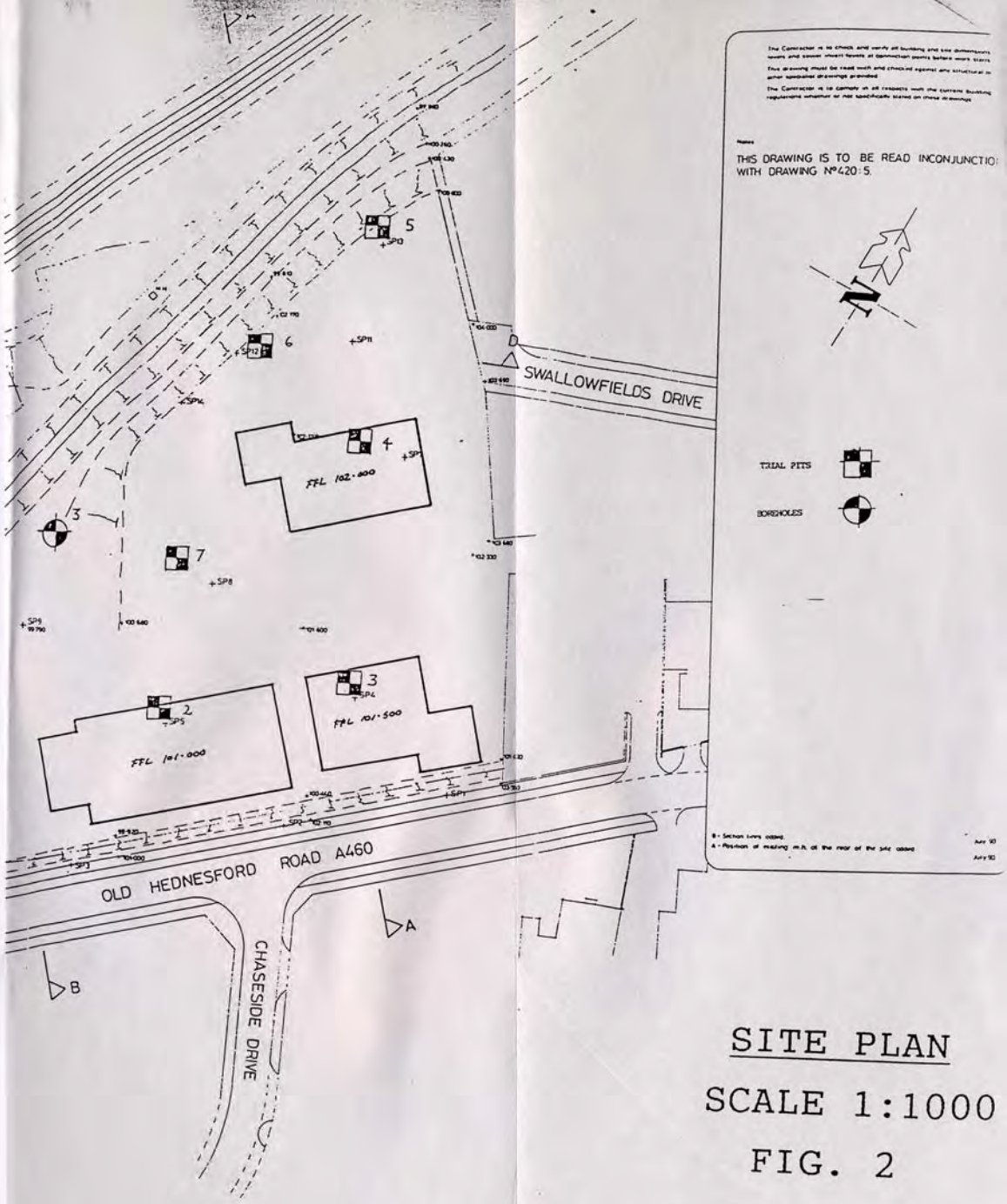
These materials are likely to consolidate considerably as a result of applied loads creating excessive differential settlement particularly in locations where large rafts span areas of differing engineering properties. Therefore this foundation solution will



DOUGLAS TECHNICAL SERVICES LIMITED 395, George Road, Erdington, BIRMINGHAM B23 7RZ Phone – 021 – 344 – 4888	Client Shervale Developments	Title Site Location Plan	
	Job Old Hednesford Road		
	Ref. 25-5540	Date	Scale FIG. 1



DOUGLAS TECHNICAL SERVICES LIMITED 395, George Road, Erdington, BIRMINGHAM B23 7RZ Phone - 021-344-4888	Client: Shervale Developments	Title: Site Location Plan	
	Job: Old Hednesford Road		
	Ref: 25-5540	Date	Scale: FIG. 1



SITE PLAN

SCALE 1:1000

FIG. 2

BORED FOR SHERVALE DEVELOPMENTS LTD.
LOCATION OLD HEDNESFORD ROAD, CANNOCK

NATIONAL GRID REF.
GROUND SURFACE LEVEL
DATE STARTED 31/7/90
DATE COMPLETED 1/8/90

BOREHOLE No. 1 (SHEET 1 OF 2)

TYPE OF BORING SHELL & AUGER

DIAMETER 250 mm
LINING TUBES TO 14·00 m
INCLINATION VERTICAL

DESCRIPTION OF STRATA	SECTION	DEPTH BELOW SURFACE m	THICKNESS m	O.D. LEVEL	SAMPLES TYPE	SAMPLES No.	SAMPLES DEPTH m	S.P.T. Blows per 300mm	GROUND WATER OBSERVATIONS	REMARKS
		0·00					0·00			
FILL (LOOSE BROWN SILTY SLIGHTLY CLAYEY SAND WITH FINE TO COARSE GRAVELS, ROOTS AND PEAT TRACES)					B	1				
		1·10					1·10			
FILL (SOFT GREY BROWN & BLACK SILTY SANDY CLAY WITH FINE TO COARSE GRAVELS OF QUARTZITE AND SLAG).					C	2		7		4/2,2,2,1
							1·55			
					B	3				
							2·30			
					C	4		4		
							2·75			1/1,1,1,1
					B	5				
					W	8	3·20		3·20 m ▽ AFTER 15 mins.	
		3·60				6	3·60			1/1,1,1,–
DARK BROWN PLASTIC AMORPHOUS PEAT					C B	7		3		
		4·10					4·05			
LOOSE TO MEDIUM DENSE GREY BROWN FINE TO COARSE SUB ANGULAR TO SUBROUNDED GRAVEL WITH COBBLES							4·10		▽ 4·10 m CASING AT 3·0 m	
					B	9				
		4·60					4·60			
					C	10		11		6/3,3,2,3
							5·05			
LOOSE TO MEDIUM DENSE GREY BROWN SAND WITH FINE TO MEDIUM GRAVELS.					B	11				
		6·00					6·00			
					C	12		8		3/2,2,2,2
LOOSE RED BROWN SILTY SLIGHTLY CLAYEY FINE TO MEDIUM SAND							6·45			
					B	13				
		7·30					7·30			
					C	14		12		5/3,2,3,4
MEDIUM DENSE RED BROWN FINE TO COARSE SAND AND FINE TO COARSE SUB-ANGULAR TO SUB ROUNDED GRAVEL OF MAINLY QUARTZITE							7·75			
					B	15				
							8·60			
					C	16		16		7/4,5,3,4
							9·05			
					B	17				
		(10·00)					10·00			

WEATHER

VERTICAL SCALE 1:50

FIG 7

BORED FOR SHERVALE DEVELOPMENTS LTD.
LOCATION OLD HEDNESFORD ROAD, CANNOCK

BOREHOLE No. 1 (SHEET 2 OF 2)

TYPE OF BORING SHELL & AUGER

NATIONAL GRID REF.
GROUND SURFACE LEVEL
DATE STARTED 31/7/90
DATE COMPLETED 1/8/90

DIAMETER 250 mm
LINING TUBES TO 14·00 m
INCLINATION VERTICAL

DESCRIPTION OF STRATA	SECTION	DEPTH BELOW SURFACE m	THICKNESS m	O.D. LEVEL	SAMPLES TYPE	SAMPLES No.	SAMPLES DEPTH m	S.P.T. Blows per 300mm	GROUND WATER OBSERVATIONS	REMARKS
		(10·00)			C	18	10·00			
VERY DENSE RED BROWN SLIGHTLY SANDY FINE TO COARSE SUB ANGULAR TO SUB-ROUNDED GRAVEL OF MAINLY QUARTZITE							10·30	52	FOR 150 mm	30/22,30,–,–.
					B	19				
		10·70			C	20	10·70	17		5/4,4,5,4
MEDIUM DENSE RED BROWN FINE TO COARSE SAND WITH FINE TO MEDIUM SUB-ROUNDED SUB ANGULAR GRAVEL OF MAINLY QUARTZITE							11·15			
					B	21				
					C	22	12·00	17		7/4,5,4,4
					B	23				
MEDIUM DENSE RED-BROWN CLAYEY SAND AND FINE TO MEDIUM GRAVEL		13·40			B	24	13·40			
		13·90			S	25	13·90	57	FOR 150 mm	20/19,38,–,–.
VERY STIFF BECOMING HARD MOTTLED RED-BROWN, CREAM & ORANGE SILTY CLAY WITH FINE ANGULAR LITHORELICTS							14·20			
					S	26	14·60	67	FOR SEATING DISTANCE ONLY	67/–,–,–,–.
		14·75					14·75			
END OF BOREHOLE										

① ½ HOUR CHISELLING FROM 13·90 TO 14·60 m

WEATHER

VERTICAL SCALE 1:50

FIG

BORED FOR SHERVALE DEVELOPMENTS LTD.
LOCATION OLD HEDNESFORD ROAD, CANNOCK

BOREHOLE No. 2 (SHEET 1 OF 2)

TYPE OF BORING SHELL & AUGER

NATIONAL GRID REF.
GROUND SURFACE LEVEL
DATE STARTED 2/8/90
DATE COMPLETED 2/8/90

DIAMETER 250 mm
LINING TUBES TO 14·20m
INCLINATION VERTICAL

DESCRIPTION OF STRATA	SECTION	DEPTH BELOW SURFACE m	THICKNESS m	O.D. LEVEL	SAMPLES TYPE	SAMPLES No.	SAMPLES DEPTH m	S.P.T. Blows per 300mm	GROUND WATER OBSERVATIONS	REMARKS
FILL (STIFF BLACK & GREY SILTY CLAY WITH GRAVELS OF COAL AND MUDSTONE SOME PEAT TRACES & ROOTS)		0·00					0·00			
					B	1				
FILL (SOFT TO VERY SOFT BLACK AND GREY SILTY CLAY WITH POCKETS OF ORGANIC CLAY & PEAT. TRACES OF COAL)		1·20			C	2	1·20	4		2/ 1, 2, 1, –.
							1·65			
					B	3				
							2·30			1/ 1, –, 1, –.
					C	4		2		
							2·75			
					B	5				
					W	10	3·30		3·30m AFTER 15 mins.	
		3·80					3·80		CASING AT 4·00m	7/ 4, 3, 2, 2.
MEDIUM DENSE RED BROWN VERY SANDY FINE TO COARSE SUB ANGULAR TO SUB ROUNDED GRAVEL OF MAINLY QUARTZITE					C	6		12		
					B	7	4·25			
							4·30			
					B	8				
					C	9	5·00			
								14		8/ 3, 4, 4, 3
					B	11				
LOOSE RED BROWN FINE TO COARSE SAND		6·30			C	12	6·30	9		6/ 3, 2, 2, 2
							6·75			
					B	13				
LOOSE TO MEDIUM DENSE RED BROWN SLIGHTLY SILTY FINE TO COARSE SAND AND FINE TO COARSE SUB ANGULAR TO SUB ROUNDED GRAVEL OF MAINLY QUARTZITE. MEDIUM DENSE BELOW 8·80m		7·50			C	14	7·50	10		5/ 3, 2, 2, 3
							7·95			
					B	15				
					C	16	8·80	15		5/ 4, 4, 3, 4
							9·25			
					B	17				
		(10·00)					10·00			

WEATHER

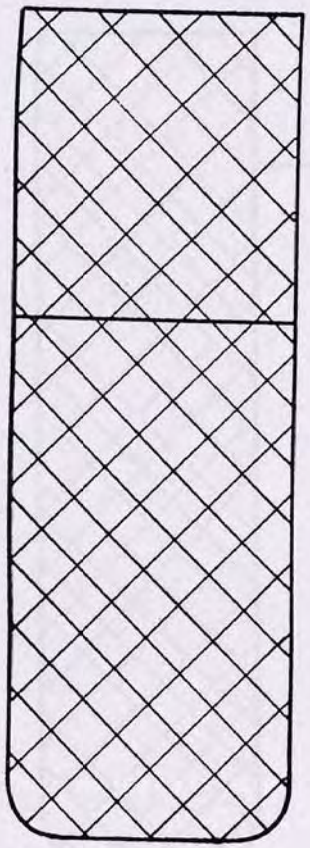
● DISTURBED SAMPLE ■ UNDISTURBED SAMPLE

VERTICAL SCALE 1:50

□ S STANDARD PENETRATION TEST

FIG 5

TRIAL PIT 2



DEPTH (m)

0 · 00

FILL (LOOSE TO MEDIUM DENSE GREY SILTY SANDY FINE TO COARSE SUB ANGULAR GRAVEL OF MUDSTONE AND COAL WITH COBBLES AND BOULDERS)

1 · 50

FILL (AS 0·00 – 1·50m WITH SOFT TO FIRM GREY SILTY CLAY WITH COAL AND WOOD FRAGMENTS. VERY CLAYEY BELOW 2·10 m.)

4 · 00

REMARKS

1. STRONG INFLOW OF WATER AT 4·00m. STANDING AT 3·90m AFTER 5mins.
2. PIT WALLS UNSTABLE BELOW 1·80m.
3. PIT TERMINATED AT 4·00m.
4. LONG AXIS ORIENTATION N 50°

DOUGLAS TECHNICAL SERVICES LIMITED 395, George Road, Erdington, BIRMINGHAM B23 7RZ Phone - 021 – 344 – 4888	DATE EXCAVATED 10 – 8 – 90 DATE BACKFILLED 10 – 8 – 90 LENGTH 3·20m WIDTH 1·30m GROUND SURFACE LEVEL	Client SHERVALE DEVELOPMENTS LTD.	Title TRIAL PIT 2	
		Contract OLD HEDNESFORD ROAD, CANNOCK		
		Ref. 25-5540	Date 13 – 8 – 90	Scale
				FIG. 10

CONTRACT No 23 9340

BORED FOR SHERVALE DEVELOPMENTS LTD.
LOCATION OLD HEDNESFORD ROAD, CANNOCK

BOREHOLE No. 2 (SHEET 2 OF 2)

TYPE OF BORING SHELL & AUGER

NATIONAL GRID REF.
GROUND SURFACE LEVEL
DATE STARTED 2/8/90
DATE COMPLETED 2/8/90

DIAMETER 250 mm
LINING TUBES TO 14·20 m
INCLINATION VERTICAL

DESCRIPTION OF STRATA	SECTION	DEPTH BELOW SURFACE m	THICKNESS m	O.D. LEVEL	SAMPLES TYPE	SAMPLES No.	SAMPLES DEPTH m	S.P.T. Blows per 300mm	GROUND WATER OBSERVATIONS	REMARKS
		(10 00)					10·00			
MEDIUM DENSE RED BROWN FINE TO COARSE SAND AND FINE TO COARSE SUB ANGULAR TO SUB ROUNDED GRAVEL OF MAINLY QUARTZITE					C	18		22		4/7, 4, 5, 6
					B	19	10·90			
					B	20				
					C	21	12·00	15		6/4, 3, 4, 4
					B	22	12·45			
MEDIUM DENSE RED BROWN CLAYEY SAND AND FINE TO MEDIUM GRAVEL		13·60			C	23	13·60	24		10/5, 6, 6, 7
					B	24				
VERY STIFF BROWN BECOMING GREY & HARD SILTY CLAY WITH FINE ANGULAR LITHORELICTS		14·20			S	25	14·20	58	FOR 150 mm	21/21, 37, –, –.
							14·50			
					S	26	14·80	49	FOR 75 mm	46/49, –, –, –.
		15·00					15·00			
END OF BOREHOLE										

① ½ HOUR CHISELLING FROM 14·00 – 14·80 m.

WEATHER

VERTICAL SCALE 1:50

■ UNDISTURBED SAMPLE
□ S STANDARD PENETRATION TEST

FIG 6

CONTRACT No 25-5540

RECORD OF BORING

BOREHOLE No. 3 (SHEET 1 OF 2)

BORED FOR SHERVALE DEVELOPMENTS LTD.
LOCATION OLD HEDNESFORD ROAD, CANNOCK

TYPE OF BORING SHELL & AUGER

NATIONAL GRID REF.
GROUND SURFACE LEVEL
DATE STARTED 30/7/90
DATE COMPLETED 31/7/90

DIAMETER 250 mm
LINING TUBES TO 14·50m
INCLINATION VERTICAL

DESCRIPTION OF STRATA	SECTION	DEPTH BELOW SURFACE m	THICKNESS m	O.D. LEVEL	SAMPLES TYPE	SAMPLES No.	SAMPLES DEPTH m	S.P.T. Blows per 300mm	GROUND WATER OBSERVATIONS	REMARKS
		0·00								
FILL (SOFT BROWN SILTY SANDY CLAY WITH QUARTZITE GRAVELS)					B	1	0·10			
		1·10			C	2	1·10	6		4/1, 2, 1, 2
FILL (SOFT GREY & BLACK SILTY CLAY WITH FINE TO COARSE GRAVELS OF COAL, SHALE AND MUDSTONE. VERY SOFT FROM 3·40 – 4·80m, WITH PEAT TRACES AND VERY SOFT BLACK ORGANIC CLAY).					B	3	1·55			
					C	4	2·20	6		2/ 2, 1, 1, 2
					B	5	2·65			
					S W	6 10	3·40 3·60 3·85	3	3·60m	2/ –, 1, 1, 1
					S	7	4·40	10	AFTER 15 mins	2/1, 1, 1, 7
		4·80					4·85			
FILL (LOOSE TO MEDIUM DENSE GREY/BROWN VERY CLAYEY SILTY SAND WITH FINE GRAVELS)					B	8				
		5·50			C	9	5·50	10	CASING AT 5·50m	3/ 3, 2, 3, 2
LOOSE TO MEDIUM DENSE RED BROWN SANDY FINE TO COARSE SUB ANGULAR TO SUB ROUNDED GRAVEL WITH COBBLES OF MAINLY QUARTZITE.					B	11	5·95			
VERY SANDY FROM 7·00 – 8·40m AND BECOMING LOOSE TO VERY LOOSE.					C	12	7·00	3		1/1, 1, –, 1
					B	13	7·45			
		8·40					8·40			
SOFT TO FIRM RED BROWN SILTY CLAY					S	14		10		3/ 2, 2, 3, 3
					B	15	8·85			
					S	16	9·20	11		5/ 3, 2, 3, 3
		(9·65)					9·65			

WEATHER

VERTICAL SCALE 1:50

FIG 7

CONTRACT No 25-5540

RECORD OF BORING

BOREHOLE No. 3 (SHEET 2 OF 2)

BORED FOR SHERVALE DEVELOPMENTS LTD.
LOCATION OLD HEDNESFORD ROAD, CANNOCK

TYPE OF BORING SHELL & AUGER

NATIONAL GRID REF.
GROUND SURFACE LEVEL
DATE STARTED 30/7/90
DATE COMPLETED 31/7/90

DIAMETER 250mm
LINING TUBES TO 14·50 m
INCLINATION VERTICAL

DESCRIPTION OF STRATA	SECTION	DEPTH BELOW SURFACE m	THICKNESS m	O.D. LEVEL	SAMPLES TYPE	SAMPLES No.	SAMPLES DEPTH m	S.P.T. Blows per 300mm	GROUND WATER OBSERVATIONS	REMARKS
SOFT TO FIRM RED BROWN SILTY CLAY WITH FINE TO COARSE SUB ROUNDED TO SUB ANGULAR GRAVELS		9·65					9·65			
					B	17				
		10·80					10·80			
LOOSE RED BROWN COARSE SAND WITH FINE TO COARSE SUB ANGULAR TO SUB ROUNDED QUARTZITE GRAVELS					C	18		9		3/2,2,2,3
							11·25			
					B	19				
							12·00			
					C	20		7		4/2.1,2,2
							12·45			
					B	21				
		13·00					13·00			
AS 10·80 – 13·00m BECOMING MEDIUM DENSE BELOW 13·00m					C	22		27		7/4,5,8,10
					B	23	13·45			
										50/-, -, -, -
		13·90					13·90			
FRESH RED BROWN FINE GRAINED CONGLOMERATE, MODERATELY STRONG					C	24	14·00 14·05	50	FOR SEATING DISTANCE ONLY	
		14·55			C	25	14·50 14·55	55	FOR SEATING DISTANCE ONLY	50/1,-,17,-,
END OF BOREHOLE										

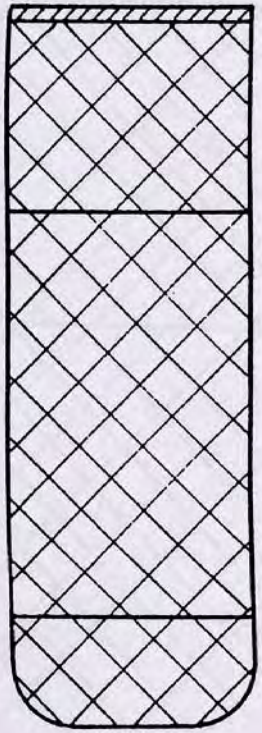
① 1 HOUR CHISELLING FROM 13·90 – 14·50 m

WEATHER

VERTICAL SCALE 1:50

FIG 9

TRIAL PIT 1



DEPTH (m)

0.00 — TURF OVER TOPSOIL

0.10 — FILL (FIRM GREY SILTY CLAY WITH NUMEROUS FINE TO COARSE GRAVELS OF MUDSTONE COAL, QUARTZITE)

0.90 — FILL (SOFT GREY SILTY CLAY WITH NUMEROUS FINE TO COARSE GRAVELS OF MUDSTONE COAL, QUARTZITE AND BROWN SANDY CLAY POCKETS AND TRACES OF ORGANIC MATERIAL. BECOMING VERY GRAVELLY BELOW 1.90m)

2.80 — FILL (LOOSE GREY VERY CLAYEY FINE TO COARSE SUB ANGULAR GRAVEL OF MUDSTONE, COAL AND QUARTZITE, WITH BOULDERS AND COBBLES OF BRICK AND LARGE PIECES OF TIMBER)

3.30

REMARKS

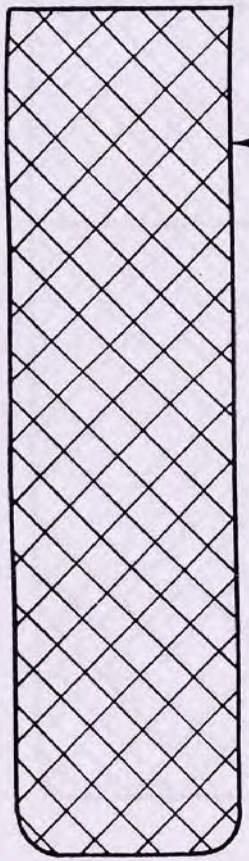
1. SLIGHT SEEPAGE AT 1.30m, STRONG INFLOW OF WATER AT 1.60m.
2. PIT WALLS UNSTABLE FROM 0.5m
3. PIT TERMINATED AT 3.30m.
4. WATER STANDING AT 1.55m ON COMPLETION.
5. LONG AXIS ORIENTATION N 260°

DOUGLAS TECHNICAL SERVICES LIMITED 395, George Road, Erdington, BIRMINGHAM B23 7RZ Phone - 021-344-4888	DATE EXCAVATED 10-8-90 DATE BACKFILLED 10-8-90 LENGTH 3.10m WIDTH 1.10m GROUND SURFACE LEVEL	Client SHERVALE DEVELOPMENTS LTD. Contract OLD HEDNESFORD ROAD, CANNOCK Ref. 25-5540 Date 13-8-90	Title TRIAL PIT 1 Scale	FIG. 9

TRIAL PIT 3

DEPTH (m)

1 · 00



FILL (LOOSE TO MEDIUM DENSE GREY SILTY SANDY FINE TO COARSE SUB ANGULAR GRAVEL OF MUDSTONE, COAL WITH COBBLES AND BOULDERS SLIGHTLY CLAYEY BELOW 1·80m, LARGE BOULDER AT 2·00m.)

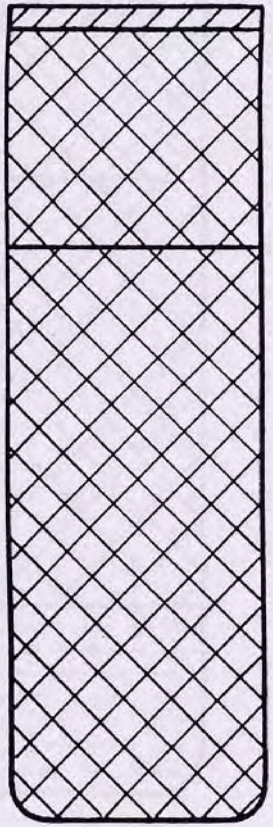
4·00

REMARKS

1. SLIGHT SEEPAGE AT 3·40m, STRONG INFLOW OF WATER AT 3·90m.
2. PIT WALLS UNSTABLE BELOW 3·00m.
3. PIT TERMINATED AT 4·00m.
4. WATER STANDING AT 3·90m ON COMPLETION.
5. LONG AXIS ORIENTATION N 230°

DOUGLAS TECHNICAL SERVICES LIMITED 395, George Road, Erdington, BIRMINGHAM B23 7RZ Phone - 021-344-4888	DATE EXCAVATED 10-8-90 DATE BACKFILLED 10-8-90 LENGTH 2·80m WIDTH 1·10m GROUND SURFACE LEVEL	Client: SHERVALE DEVELOPMENTS LTD. Contract: OLD HEDNESFORD ROAD, CANNOCK Ref. 25-5540 Date 13-8-90	Title: TRIAL PIT 3 Scale FIG. 11

TRIAL PIT 4



DEPTH (m)

0.00 — TURF OVER TOPSOIL

0.10 — FILL (LOOSE TO MEDIUM DENSE GREY SILTY SANDY FINE TO COARSE SUB ANGULAR GRAVEL OF MUDSTONE, SILTSTONE, COAL WITH NUMEROUS COBBLES AND OCCASIONAL BOULDERS)

1.10 — FILL (LOOSE BLACK SILTY ASH AND SLIGHTLY CLAYEY FINE TO COARSE SUB ANGULAR GRAVEL OF SHALE, COAL, MUDSTONE AND BRICK WITH SOME COBBLES)

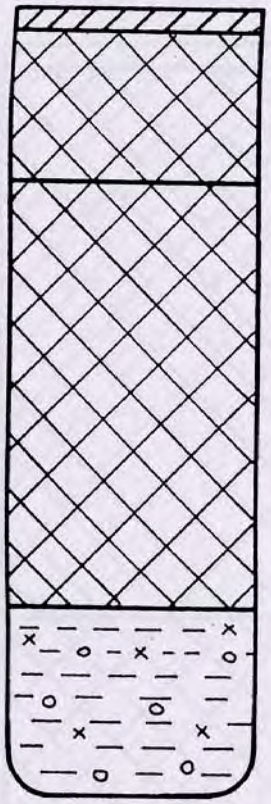
3.80

REMARKS

1. SEEPAGE AT 3.70m.
2. PIT WAS GENERALLY STABLE.
3. PIT TERMINATED AT 3.80m.
4. WATER STANDING AT 3.75m ON COMPLETION.
5. LONG AXIS ORIENTATION N 80°

DOUGLAS TECHNICAL SERVICES LIMITED 395, George Road, Erdington, BIRMINGHAM B23 7RZ Phone - 021-344-4888	DATE EXCAVATED 10-8-90 DATE BACKFILLED 10-8-90 LENGTH 3.20m WIDTH 1.20m GROUND SURFACE LEVEL	Client: SHERVALE DEVELOPMENTS LTD. Contract: OLD HEDNESFORD ROAD, CANNOCK Ref. 25-5540 Date 13-8-90	Title: TRIAL PIT 4 Scale FIG. 12

TRIAL PIT 5



DEPTH (m)

0.00 — TURF OVERLYING TOPSOIL

0.10 — FILL (LOOSE TO MEDIUM DENSE GREY BROWN SILTY SANDY FINE TO COARSE GRAVEL OF MUDSTONE, QUARTZITE WITH SOME COBBLES AND BOULDERS AND PIECES OF TIMBER)

0.80 — FILL (LOOSE TO MEDIUM DENSE DARK GREY SILTY VERY CLAYEY ASH AND FINE TO COARSE GRAVEL OF MUDSTONE, COAL WITH SOME COBBLES AND BOULDERS)

2.80 — SOFT BROWN SILTY SANDY CLAY WITH FINE TO COARSE MAINLY SUB ROUNDED QUARTZITE GRAVELS. ORANGE/YELLOW IN PLACES WITH TRACES OF ORGANIC MATERIAL.

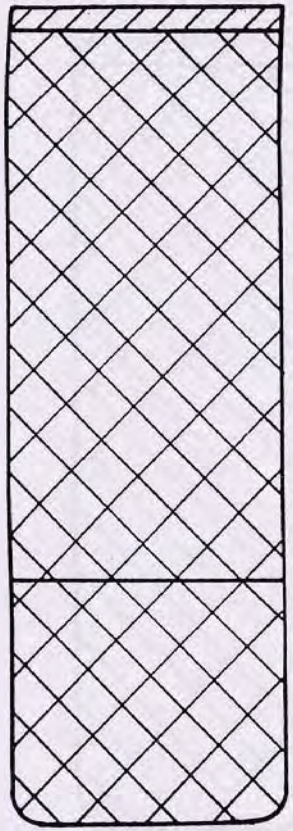
3.70

REMARKS

1. PIT DRY ON COMPLETION.
2. PIT WALLS GENERALLY STABLE
3. PIT TERMINATED AT 3·70m.
4. LONG AXIS ORIENTATION N 336°

DOUGLAS TECHNICAL SERVICES LIMITED 395, George Road, Erdington, BIRMINGHAM B23 7RZ Phone - 021-344-4888	DATE EXCAVATED 10-8-90 DATE BACKFILLED 10-8-90 LENGTH 3·10m WIDTH 1·20m GROUND SURFACE LEVEL	Client SHERVALE DEVELOPMENTS LTD. Contract OLD HEDNESFORD ROAD, CANNOCK Ref. 25-5540 Date 13-8-90	Title TRIAL PIT 5 Scale	FIG. 13

TRIAL PIT 6



DEPTH (m)

0 · 00

0 · 10 — TURF OVERLYING TOPSOIL

FILL (LOOSE – MEDIUM DENSE GREY SILTY SANDY FINE TO COARSE SUB ANGULAR GRAVEL OF MUDSTONE, SANDSTONE WITH COBBLES AND BOULDERS. BECOMING CLAYEY AND DARK GREY BELOW 1·30 m.)

2 · 70

FILL (SOFT MOTTLED YELLOW, GREY AND BLACK SILTY CLAY WITH COARSE SUB ANGULAR GRAVELS OF SANDSTONE, MUDSTONE AND COBBLES AND BOULDERS WITH PIECES OF TIMBER)

3 · 70

REMARKS

1/ PIT DRY ON COMPLETION.

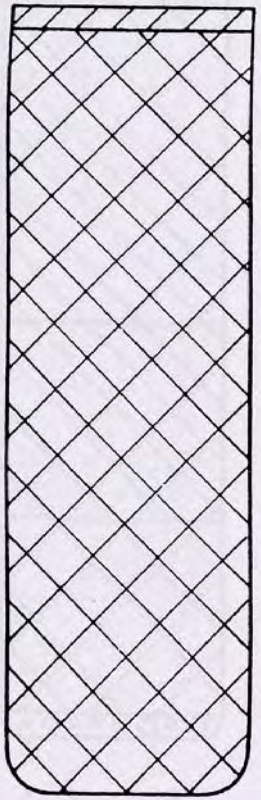
2/ PIT WALLS UNSTABLE BELOW 2·70 m.

3/ PIT TERMINATED AT 3·70 m

4/ LONG AXIS ORIENTATION N 20°

DOUGLAS TECHNICAL SERVICES LIMITED 395, George Road, Erdington, BIRMINGHAM B23 7RZ Phone - 021 – 344 – 4888	DATE EXCAVATED 10 – 8 – 90 DATE BACKFILLED 10 – 8 – 90 LENGTH 3·30 m WIDTH 1·30 m GROUND SURFACE LEVEL	Client SHERVALE DEVELOPMENTS LTD. Contract OLD HEDNESFORD ROAD, CANNOCK Ref. 25-5540 Date 13-8-90	Title TRIAL PIT 6 Scale FIG. 14

TRIAL PIT 7



DEPTH (m)

0 · 00 — TURF OVER TOPSOIL

0 · 10

FILL (LOOSE BLACK SILTY ASH AND FINE TO COARSE GRAVEL OF MUDSTONE, SILTSTONE, COAL, SHALE WITH OCCASIONAL COBBLES AND POCKETS OF SOFT BLACK SILTY CLAY FROM 0·10 – 3·30 m)

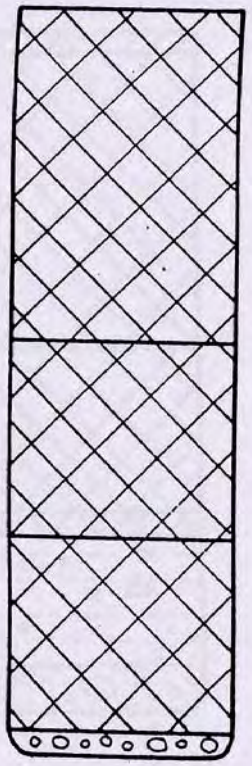
3 · 70

REMARKS

1. SLIGHT SEEPAGE FROM 3·30m.
2. PIT WALLS UNSTABLE BELOW 3·30m.
3. PIT TERMINATED AT 3·70m.
4. LONG AXIS ORIENTATION N 306°

DOUGLAS TECHNICAL SERVICES LIMITED 395, George Road, Erdington, BIRMINGHAM B23 7RZ Phone - 021 – 344 – 4888	DATE EXCAVATED 10 – 8 – 90 DATE BACKFILLED 10 – 8 – 90 LENGTH 2·80 m WIDTH 1·10 m GROUND SURFACE LEVEL	Client SHERVALE DEVELOPMENTS LTD. Contract OLD HEDNESFORD ROAD, CANNOCK Ref. 25-5540 Date 13-8-90	Title TRIAL PIT 7 Scale FIG. 15

TRIAL PIT 8



DEPTH (m)

0 · 00 — FILL (MEDIUM DENSE TO DENSE GREY BROWN SILTY SANDY FINE TO COARSE SUB ANGULAR GRAVEL OF BRICKS, CONCRETE, MUDSTONE, SANDSTONE WITH PIECES OF WIRE, PLASTIC AND RAGS AND NUMEROUS COBBLES AND BOULDERS.)

1 · 60 — FILL (SOFT GREY BROWN SANDY SILTY CLAY WITH FINE TO COARSE SUB ANGULAR GRAVELS OF BRICK, SHALE, COAL, QUARTZITE, GLASS WITH TRACES OF ORGANIC MATERIAL AND DARK BROWN ORGANIC CLAY)

2 · 50 — FILL (LOOSE RED AND GREY BROWN CLAYEY SAND AND FINE TO COARSE QUARTZITE GRAVEL)

3 · 40 — MEDIUM DENSE TO DENSE FINE TO COARSE MAINLY SUB ROUNDED SLIGHTLY SANDY QUARTZITE GRAVEL.

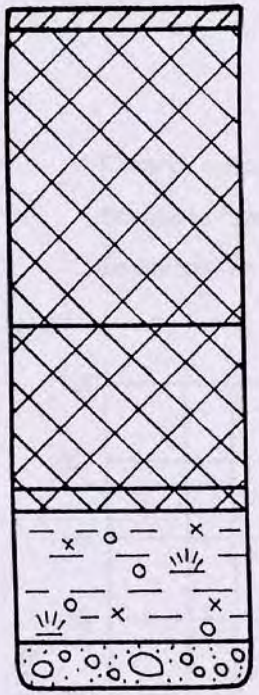
3 · 50

REMARKS

1. SEEPAGE AT 2·50m.
2. PIT WALLS UNSTABLE FROM 1·60 – 3·40m
3. PIT TERMINATED AT 3·50m.
4. LONG AXIS ORIENTATION N 6°.
5. DIFFICULT TO EXCAVATE FROM 0 00 – 1·60m AND 3·40m – 3·50m.
6. WATER STANDING AT 3·40m ON COMPLETION.

DOUGLAS TECHNICAL SERVICES LIMITED 395, George Road, Erdington, . BIRMINGHAM B23 7RZ Phone - 021 – 344 – 4888	DATE EXCAVATED 10 – 8 – 90 DATE BACKFILLED 10 – 8 – 90 LENGTH 3·70m WIDTH 1·10m GROUND SURFACE LEVEL	Client SHERVALE DEVELOPMENTS LTD. Contract OLD HEDNESFORD ROAD, CANNOCK Ref. 25-5540 Date 13-8-90	Title TRIAL PIT 8 Scale	FIG. 16

TRIAL PIT 9



DEPTH (m)

0.00 — TURF OVER TOPSOIL

0.10 — FILL (MEDIUM DENSE - DENSE GREY BROWN SILTY SANDY FINE TO COARSE SUB ANGULAR GRAVEL OF BRICK, CONCRETE, QUARTZITE WITH PIECES OF WIRE, PLASTIC, RAGS).

1.50 — FILL (SOFT BLUE GREY AND BROWN SILTY CLAY WITH FINE TO COARSE GRAVELS OF MUDSTONE WITH SOME ORGANIC TRACES)

2.30 — DARK BROWN TOPSOIL

2.40 — SOFT TO FIRM DARK BROWN SILTY SANDY CLAY WITH FINE TO COARSE SUB ROUNDED QUARTZITE GRAVELS AND ORGANIC PEATY TRACES.

3.00 — LOOSE TO MEDIUM DENSE RED BROWN SILTY VERY SANDY FINE TO COARSE SUB ROUNDED QUARTZITE GRAVEL.

3.20

REMARKS

1. SLIGHT SEEPAGE AT 2.30m, STRONG INFLOW AT 3.20m.
2. PIT WALLS GENERALLY STABLE ABOVE 3.00m.
3. PIT TERMINATED AT 3.20m.
4. LONG AXIS ORIENTATION N 346°.
5. DIFFICULT TO EXCAVATE FROM 0.10 - 1.50m.

DOUGLAS TECHNICAL SERVICES LIMITED
395, George Road,
Erdington,
BIRMINGHAM B23 7RZ
Phone - 021-344-4888

DATE EXCAVATED 10-8-90
DATE BACKFILLED 10-8-90
LENGTH 3.30m WIDTH 1.10m
GROUND SURFACE LEVEL

Client: SHERVALE DEVELOPMENTS LTD.
Contract: OLD HENDESFORD ROAD, CANNOCK
Ref. 25-5540
Date 13-8-90
Title: TRIAL PIT 9
Scale
FIG. 17

GROUND INVESTIGATION & PILING LTD.

153 Dibdale Road
D
West Mi
DY
Telephone: 01384
Fax: 01384

ardsons
Design to Build
Dudley Street
gley
t Midlands
1SA

Date: 17th September 1998
Our Ref: AJM/JPH/pm/8305
Your Ref:

und Investigation for a Chemical Contamination and Landfill Gas Assessment
ld Hednesford Road, Cannock.

mical Contamination Report.

Introduction.

A commercial development is proposed upon an unoccupied plot of land located adjacent to the Old Hednesford Road in Cannock. At the time of this investigation it is understood a public house with associated car parking areas is planned.

Upon the instruction of Design to Build, consulting engineers to the client Richardsons, two phases of exploratory works have been undertaken:

i) Two landfill gas monitoring standpipes have been installed in cable percussion boreholes and engineer verified borehole logs are included within the appendix. Landfill gas monitoring is currently underway and a report upon the findings will be issued upon completion of the monitoring programme.

ii) Six trial pits were mechanically dug on the 27th August 1998 using a JCB excavator in order to assess the potential chemical contamination of the subsoils. The exposed strata were logged by an engineering geologist and samples taken for chemical contamination analyses. Engineer verified trial pit logs are contained within the appendix.

This report contains a factual record of the strata encountered and laborat test results. Comments and recommendations are provided upon the chemi contamination testing with respect to the proposed industrial end use of the si

Ground Conditions.

Published Geological Information.

Within the accuracy of the available geological information[1] the solid geolo underlying the area of the site comprises Coal Measures strata of t Carboniferous Period. Recent alluvium together with glacial unbedded sa and gravel mixed with red clay is detailed masking the solid geology in the ar of the site.

Strata Encountered.

Reference should be made to the appended borehole and trial pit logs for details of the strata encountered by this investigation, however the salie features of the engineering geology horizons can be summarised as follows:-

Made Ground - Encountered in trial pits 1 to 4 as loose to medium den horizons of granular mudstone fragments including subordinate coal, siltsto and sandstone and in the boreholes as soft and firm clays containing mudsto fragments. Such soils are typical of colliery discard. Trial pits 5 and 6 locat in the western portion of the site revealed more variable deposits comprisi firm clays containing fragments of mudstone, gravel, ash and brick togeth with pockets of peat noted with depth. A 1.00m thick near surface horizon sandy granular materials was recorded in TP6.

Glacial Soils - Revealed underlying the made ground in BH1 and TP5 as loo sand and gravel or sand mixed with bands of firm sandy clay.

r.

was encountered in TP's 3 to 6 and both bore
d distinct standing levels at depths of betwee
level. On the basis of a series of temporary
es it is difficult to precisely define the pre
ever the recorded water entries are likely to

Comments And Recommendations.

General Comments.

1. Appropriate comments are presented below upon the potential for chem contamination of the subsoils revealed in the trial pits and boreholes of investigation with regard to the commercial end use of the site. Landfill monitoring is currently underway and a report will be issued upon completi the monitoring programme.

Chemical Contamination Assessment.

1. Eight samples of the near surface made ground soils were forwarde Analytical and Environmental Services Limited for analysis for a rang chemical contaminants. Both the suite of analyses and the samples te were chosen by Ground Investigation and Piling Limited. It should appreciated that in order to adequately investigate contamination within the in accordance with British Standards Institution Draft Document 175 (19 additional sampling points would be required with at least three samples point being tested. Therefore, the following comments should be regarde general and may need to be amended in the light of further inform becoming available.

2. The interpretation of the analytical test results is based upon the cu Department of the Environment ICRCL guidance notes[3] for parks, pla fields, open space, buildings and hard cover (i.e. non residential end u The latter guidelines employ tentative trigger and action values which d three concentration zones for each contaminant as follows:

i) Less than the "threshold" concentration - can be regarded as uncontamin for that end use and no remedial action is required.

GROUND INVESTIGATION & PILING LIMITED
Cable Percussive Borehole Log

Borehole No. BH1
Sheet 1 of 1

(mAOD):
ordinates E: N:
Date: 19/08/1998 to 19/08/1998 Location: Old Hednesford Road, Cannock.
Cased: 7.20m. Client: Richardsons.
Diameter: 150mm Engineer: Design to Build.

DESCRIPTION OF STRATA	Legend	Depth b.g.l (m)	Level (mAOD)	Water Levels (m)	Sampling TYPE	Sampling DEPTH (m b.g.l)	SPT 'N' Value	U100 Blows	Piezo/ Gas Pipe
MADE GROUND - Firm friable grey, grey brown and in parts brown silty clay with many gravel sized fragments of mudstone, occasional coal, sandstone and siltstone.					B	0.00			
					B	0.75			
					B	1.75			
					B	2.75			
				3.50 ▼					
From 3.75 becoming dark grey and black mixed with gravel sized fragments of carbonaceous mudstone					B	3.75			
				▽ 4.30					
					B	4.75			
		5.75			B	5.75			
Red brown clayey silty SAND with some quartz gravel. From 6.75 mixed with bands of firm sandy gravelly clay.					B	6.75			
		7.40							
Borehole Complete									

SAMPLES / TESTS
- U Undisturbed
- D Disturbed
- B Bulk
- W Water
- S/C SPT/CPT
- ▽ Water Strike
- ▼ Water Level

OTHER INFORMATION
1. Groundwater struck at 4.30m rising to 3.50m in 20 minutes, casing 4.00m.
2. Landfill gas monitoring standpipe installed to 5.80m.

ii) Value between the "threshold" and "action" concentrations - informed professional judgement is required to decide whether or not action is required.

iii) Greater than or equal to the "action" concentration - site can be regarded as contaminated and remedial action or a change of end use is required.

3. The full test results are included within the appendix however Table 1 summarises the results of the analyses when compared to appropriate "threshold levels" and the Kelly classification system.

Table 1 - Summary of Soil Contamination Testing (8 samples tested).

Parameter	Trigger Value[1] (mg/kg)	No. of Results > Trigger Value	Max Value (mg/kg)	Kelly2,3 Classification
Arsenic (Total)	40	0	26	Uncontaminated
Boron (Water Soluble)	3	3	7.0	Contaminated
Cadmium (Total)	15	0	3.3	Contaminated
Chromium (Total)	1000	0	18	Uncontaminated
Copper (Total)	130	1	190	N/A
Cyanide (Total)	250	0	<1	Uncontaminated
Lead (Total)	2000	0	190	Uncontaminated
Mercury (Total)	20	0	0.95	Uncontaminated
Nickel (Total)	70	1	110	N/A
PAH (Total)	1000	0	<5	N/A
Phenol (Total)	5	0	<0.5	Uncontaminated
Selenium (Total)	6	0	1.5	Uncontaminated
Sulphide (Total)	250	0	12	Slight Contaminatio
Sulphur (Elemental)	5000	0	<10	Uncontaminated
Zinc (Total)	300	1	1200	N/A

1. Interdepartmental Committee on the Redevelopment of Contaminated Land (ICRCL (1987) Guidance Note 59/83, Guidance on the Assessment and Redevelopment Contaminated Land, Department of the Environment.

2. Kelly R.T. (1980) Site Investigation and Material Problems in: Reclamation Contaminated Land, B2/4 - B2/13, Society of Chemical Industry.

3. The classification presented is for the maximum value recorded.

N/A Not Applicable.

able 1 and the appended results show that the soil samples teste
vels of contaminants that are below the trigger concentrations
sidential end uses with the following exceptions:-

oron:	BH2
	TP3
	TP4
opper:	TP3
ckel:	TP3
nc:	TP3

ction concentrations for boron, copper, nickel and zinc have not been
date by the ICRCL notes. The Kelly guidelines indicate the contan
e present at levels ranging from 'uncontaminated' to 'contaminated;.
e noted that while the Kelly guidelines indicate cadmium t
ontaminated' levels the concentrations recorded do not exceed th
gger value.

can be seen that TP3 contains elevated levels of boron, copper, n
nc. The soil type tested from this position was granular colliery s
oils being recorded across the site. Hence the likelihood for similar
oncentrations of the above contaminants elsewhere upon the site c
scounted.

3.2.6. Boron, copper, nickel and zinc are contaminants which do not normally pose a hazard to health but are phytotoxic and can, if present in sufficient concentrations in notably acidic soils restrict plant growth. The recorded pH values are all near neutral and in the light of the fact that much of the area will be covered by buildings and hardstanding following completion of the development the results are not considered to pose a significant risk. However should landscaping be required, in view of the elevated levels of boron, copper, nickel and zinc identified by the testing, it would be prudent to provide a nominal 150mm of topsoil and use plant species which exhibit some resistance to phytotoxic conditions.

3.2.7. As a whole therefore no special precautionary measures are considered necessary with respect to on site contamination. However as elevated levels of certain contaminants have been revealed it would be good working practice that during the course of construction the following procedures were adopted:-

i) Personnel involved in site development works should observe a high standard of personal hygiene. Gloves, boots and overalls should be worn by workers in contact with the made ground. Washing facilities should be provided and smoking prohibited to prevent hand to mouth transfer of toxic materials. The requirement for protective clothing is made due to the potential for more serious unidentified contamination but would otherwise be necessary in accordance with a health risk assessment.

ii) Should material require removal off site a copy of the analytical data together with an estimate of the volume of material should be submitted to the appropriate waste disposal authority for classification and designation to a suitable tip.

3.2.8. It should be appreciated that in any areas where extensive deposits of made ground are present localised 'contamination' can occur which is not identified during investigation works. Hence should any suspect materials be encountered during development works then further specialist advice should be sought and additional testing possibly undertaken.

FOR AND ON BEHALF OF :

GROUND INVESTIGATION AND PILING LIMITED.

A. J. McHugh M.Sc. B.Sc.

ENGINEERING GEOLOGIST.

GROUND INVESTIGATION & PILING LIMITED
Cable Percussive Borehole Log

Borehole No. BH2
Sheet 1 of 1

(mAOD):
Coordinates E: N:
Date: 19/08/1998 to 19/08/1998
Cased: 6.00m.
Diameter: 150mm

Location: Old Hednesford Road, Cannock.
Client: Richardsons.
Engineer: Design to Build.

DESCRIPTION OF STRATA	Legend	Depth b.g.l (m)	Level (mAOD)	Water Levels (m)	Sampling TYPE	Sampling DEPTH (m b.g.l)	SPT 'N' Value	U100 Blows	Piezo/ Gas Pipe
MADE GROUND - Soft and firm light to dark grey silty clay with many gravel sized fragments of mudstone, occasional coal and siltstone [up to cobble sized].					B	0.00			
					B	1.00			
				1.95 ▼					
					B	2.00			
				▽ 3.00	B	3.00			
					B	4.00			
		5.50			B	5.50			
MADE GROUND - Grey brown sand to gravel sized fragments of burnt shale with some mudstone, siltstone and sandstone [cobble sized].		6.00							

Borehole Complete

SAMPLES / TESTS
- U Undisturbed
- D Disturbed
- B Bulk
- W Water
- S/C SPT/CPT
- ▽ Water Strike
- ▼ Water Level

OTHER INFORMATION
1. Groundwater struck at 3.00m rising to 1.95m in 20 minutes zero casing.
2. Chiselling from 5.50m to 6.00m; 0.50 hours.
3. Landfill gas monitoring standpipe installed to 6.00m.

GROUND INVESTIGATION & PILING LIMITED
Trial Pit Log

Trial Pit No. TP1
Sheet 1 of 1

vel(mAD)

Coordinates E: N:

Location: Old Hednesford Road, Cannock.

Date: 27/08/1998

Client: Richardsons.

Plant: JCB 3CX

Engineer: Design to Build.

Depth b.g.l. (m)	Reduced level	Legend	DESCRIPTION OF STRATA	Samples Tests	Depth (m)
			MADE GROUND - Grass onto [loose to medium dense] light to dark grey and in parts black sand to gravel sized fragments of mudstone, with some carbonaceous mudstone, occasional coal, siltstone and sandstone [cobble sized], some pockets of firm friable grey clay with many gravel sized fragments of mudstone. Occasional brick and quartz gravel near surface.	D	0.50
				D	1.50
2.70			Trial Pit Complete		

ANNOTATED SKETCH DRAWING (Not to scale)

Subhorizontal strata, no sketch required.

SAMPLES / TESTS

- U Undisturbed
- D Disturbed
- B Bulk
- W Water
- HV Hand Vane (KPa)
- ▽ Water Strike
- ▼ Water Level

OTHER INFORMATION

Side Stability: Sides stable.

Other Details: 1.No groundwater encountered.
2.Moderately easy excavation.
3.The densities ascribed to the granular horizons have been assessed visually and can only be regarded as approximate.

GROUND INVESTIGATION & PILING LIMITED
Trial Pit Log

Trial Pit No. TP2
Sheet 1 of 1

Level(mAD)
Coordinates E: N:
Location: Old Hednesford Road, Cannock.
Date: 27/08/1998
Client: Richardsons.
Plant: JCB 3CX
Engineer: Design to Build.

Depth b.g.l. (m)	Reduced level	Legend	DESCRIPTION OF STRATA	Samples Tests	Depth (m)
			MADE GROUND - Grass onto [Medium dense] light to dark grey and in parts black sand to gravel and some cobble sized fragments of mudstone with some carbonaceous mudstone, siltstone, sandstone and some pockets of friable grey clay.	D	0.20
				D	1.20
			From 1.70 mixed with firm friable grey silty clay with many gravel sized fragments of mudstone.		
2.70			Trial Pit Complete		

ANNOTATED SKETCH DRAWING (Not to scale)

Subhorizontal strata, no sketch required.

SAMPLES / TESTS
- U Undisturbed
- D Disturbed
- B Bulk
- W Water
- HV Hand Vane (KPa)
- ▽ Water Strike
- ▼ Water Level

OTHER INFORMATION

Side Stability: Sides stable.

Other Details: 1.No groundwater encountered.
2.Moderately easy excavation.
3.The densities ascribed to the granular horizons have been assessed visually and can only be regarded as approximate.

GROUND INVESTIGATION & PILING LIMITED
Trial Pit Log

Trial Pit No. TP3
Sheet 1 of 1

Level(mAD)
Coordinates E: N:
Location: Old Hednesford Road, Cannock.
Date: 27/08/1998
Client: Richardsons.
Plant: JCB 3CX
Engineer: Design to Build.

Depth b.g.l. (m)	Reduced level	Legend	DESCRIPTION OF STRATA	Samples Tests	Depth (m)
			MADE GROUND - Grass onto [medium dense] light to dark grey and in parts black sand to gravel sized fragments of mudstone and carbonaceous mudstone, occasional cobble sized sandstone and siltstone and pockets of friable grey clay.	D	0.10
				D	0.60
				D	1.60
2.50			Trial Pit Complete		

ANNOTATED SKETCH DRAWING (Not to scale)

Subhorizontal strata, no sketch required.

SAMPLES / TESTS
- U Undisturbed
- D Disturbed
- B Bulk
- W Water
- HV Hand Vane (KPa)
- ▽ Water Strike
- ▼ Water Level

OTHER INFORMATION
Side Stability: Sides stable.
Other Details: 1.Groundwater entry at 2.35m
2.Moderately easy excavation.
3.The densities ascribed to the granular horizons have been assessed visually and can only be regarded as approximate.

GROUND INVESTIGATION & PILING LIMITED
Trial Pit Log

Trial Pit No. TP4
Sheet 1 of 1

Level(mAD)
Coordinates E: N:
Location: Old Hednesford Road, Cannock.
Date: 27/08/1998
Client: Richardsons.
Plant: JCB 3CX
Engineer: Design to Build.

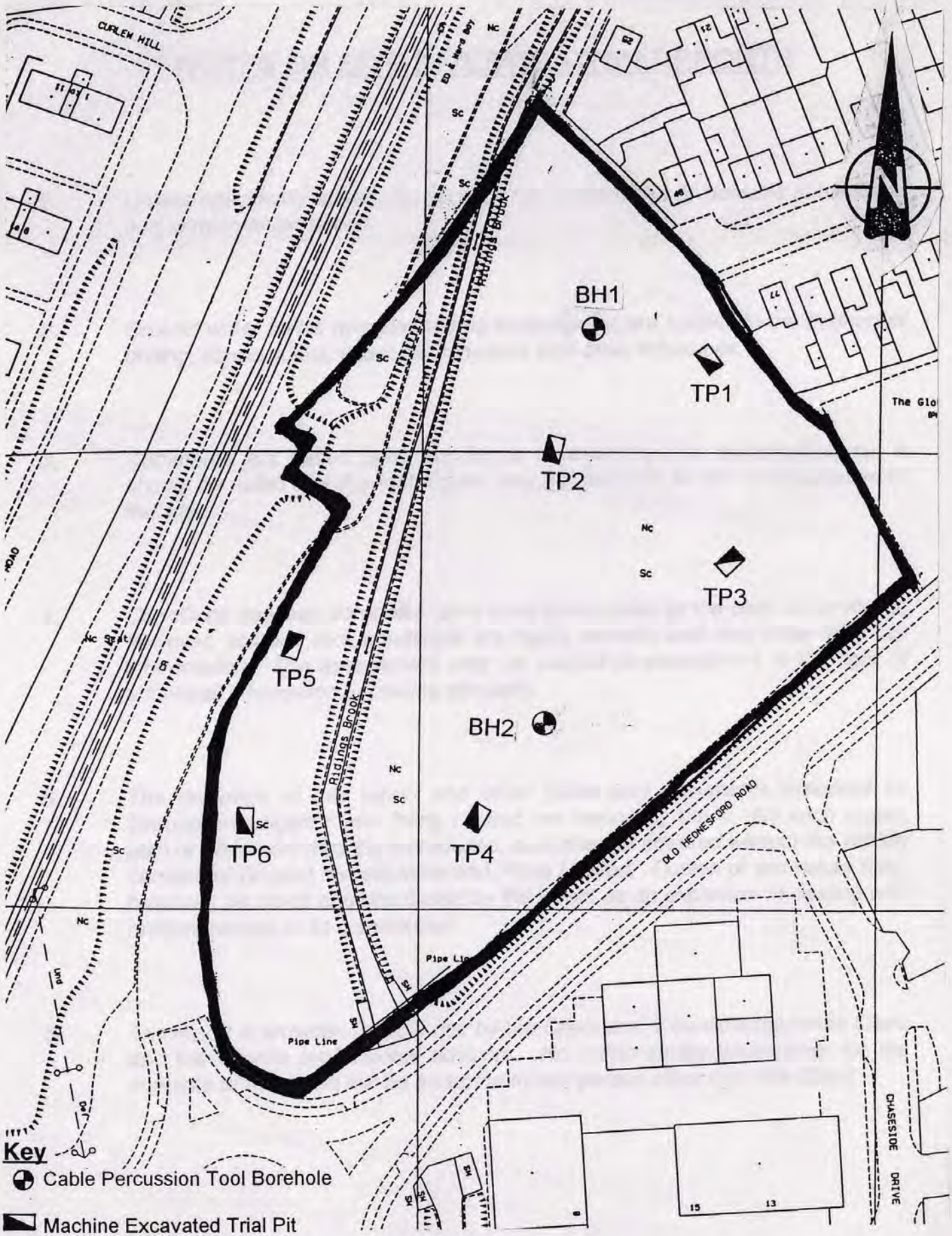
Depth b.g.l. (m)	Reduced level	Legend	DESCRIPTION OF STRATA	Samples Tests	Depth (m)
			MADE GROUND - Grass onto [medium dense] light to dark grey sand to gravel sized fragments of mudstone and carbonaceous mudstone, occasional cobble sized siltstone and sandstone, mixed with pockets of firm friable light to dark grey silty clay with many gravel sized fragments of mudstone.	D	0.40
				D	1.00
2.80			Trial Pit Complete		

ANNOTATED SKETCH DRAWING (Not to scale)

Subhorizontal strata, no sketch required.

SAMPLES / TESTS
- U Undisturbed
- D Disturbed
- B Bulk
- W Water
- HV Hand Vane (KPa)
- ▽ Water Strike
- ▼ Water Level

OTHER INFORMATION
Side Stability: Sides spalling.
Other Details: 1.Groundwater seepages from 1.40m.
2.Moderately easy excavation.
3.The densities ascribed to the granular horizons have been assessed visually and can only be regarded as approximate.



CLIENT/ENGINEER : Richardsons / Design to Build.

Ground Investigation and Piling Limited.
153 Dibdale Road West, Dudley, DY1 2RR
Telephone: Dudley (01384) - 455255

TITLE : Chemical Contamination & Landfill Gas Investigation Old Hednesford Road, Cannock. Plan Detailing Approximate Exploratory Hole Locations.

SCALE: N.T.S.	**DRG:** 1	**CONTRACT:** 8305	**DATE:** August 1998

GROUND INVESTIGATION & PILING LIMITED
Trial Pit Log

Trial Pit No. TP5
Sheet 1 of 1

Level(mAD)
Coordinates E: N:
Date: 27/08/1998
Plant: JCB 3CX

Location: Old Hednesford Road, Cannock.
Client: Richardsons.
Engineer: Design to Build.

Depth b.g.l. (m)	Reduced level	Legend	DESCRIPTION OF STRATA	Samples Tests	Depth (m)
			MADE GROUND - Grass onto firm friable light to dark grey and in parts black silty clay with many gravel sized fragments of mudstone, occasional brick, quartz gravel and cobble sized fragments of siltstone. Some pockets of brown sand with quartz gravel, brick and ceramic.	D	0.50
				D	1.50
			From 2.50 with occasional bands / pockets of soft brown silty very sandy clay and fibrous peat.		
2.80				D	2.90
3.00			[Loose] orange brown very clayey SAND and GRAVEL, with some bands of gravelly clay.		
			Trial Pit Complete		

ANNOTATED SKETCH DRAWING (Not to scale)

Subhorizontal strata, no sketch required.

SAMPLES / TESTS
- U Undisturbed
- D Disturbed
- B Bulk
- W Water
- HV Hand Vane (KPa)
- ▽ Water Strike
- ▼ Water Level

OTHER INFORMATION

Side Stability: Minor spalling of pit sides.

Other Details:
1. Groundwater seepages from 2.00m.
2. Moderately easy excavation.
3. The densities ascribed to the granular horizons have been assessed visually and can only be regarded as approximate.

GROUND INVESTIGATION & PILING LIMITED
Trial Pit Log

Trial Pit No. TP6
Sheet 1 of 1

Level(mAD)
Coordinates E: N:
Date: 27/08/1998
Plant: JCB 3CX

Location: Old Hednesford Road, Cannock.
Client: Richardsons.
Engineer: Design to Build.

Depth b.g.l. (m)	Reduced level	Legend	DESCRIPTION OF STRATA	Samples Tests	Depth (m)
			MADE GROUND - Grass onto [loose] dark brown clayey silty sand and sand to gravel sized fragments of ash with some gravel to cobble sized fragments of brick, concrete, mudstone, quartz gravel, clay pockets, occasional metal, fabric and clinker	D	0.30
1.00			MADE GROUND - Firm friable brown and dark brown silty sandy clay with some quartz gravel, gravel sized fragments of mudstone, ash and occasional wood.	D	1.10
1.60			MADE GROUND - Firm light to dark grey and in parts black silty clay with many gravel sized fragments of mudstone.	D	1.70
2.20			Possible MADE GROUND - Soft brown and grey brown very silty very sandy clay with some quartz gravel and bands / pockets of brown fibrous peat.	D	2.30
3.00			Trial Pit Complete		

ANNOTATED SKETCH DRAWING (Not to scale)

Subhorizontal strata, no sketch required.

SAMPLES / TESTS
- U Undisturbed
- D Disturbed
- B Bulk
- W Water
- HV Hand Vane (KPa)
- ▽ Water Strike
- ▼ Water Level

OTHER INFORMATION

Side Stability: Minor spalling of pit sides.

Other Details: 1.Groundwater seepages from 2.90m.
2.Moderately easy excavation.
3.The densities ascribed to the granular horizons have been assessed visually and can only be regarded as approximate.

GIP/4284
Old Hednesford Road, Cannock
GROUND INVESTIGATION & PILING
SOILS RECEIVED 28/08/98
YOUR REFERENCE 8305
YOUR ORDER NO 14182

aes

				1	2	3	4	5	6	7	8
aes SAMPLE No				BH1	BH2	TP2	TP3	TP4	TP5	TP6	TP6
SAMPLE No				0.00	1.00	0.20	0.60	0.40	0.50	0.30	1.10
Method		as	units								
R002	Arsenic (Total)	As	mg/kg	5.2	6.3	5.7	26	11	7.1	11	6.2
R011	Boron (Water Soluble)	B	mg/kg	2.6	3.6	2.5	7.0	4.3	3.0	2.4	3.0
R002	Cadmium (Total)	Cd	mg/kg	0.30	0.22	0.23	3.3	0.67	0.51	0.74	0.33
R002	Chromium (Total)	Cr	mg/kg	14	14	13	18	12	14	15	13
R002	Copper (Total)	Cu	mg/kg	30	49	51	190	65	71	55	47
R004	Cyanide (Total)	CN^-	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1
R002	Lead (Total)	Pb	mg/kg	24	22	27	190	43	50	120	59
R002	Mercury (Total)	Hg	mg/kg	0.35	0.95	0.26	0.52	0.53	0.23	0.28	0.21
R002	Nickel (Total)	Ni	mg/kg	38	40	39	110	45	36	30	18
R202	PAH (Total)		mg/kg	<5	<5	<5	<5	<5	<5	7.2	<5
R003	pH		pH units	7.5	8.2	7.7	7.6	7.5	7.7	7.6	7.5
R008	Phenol (Total)	PhOH	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
R002	Selenium (Total)	Se	mg/kg	0.37	0.38	0.33	1.5	0.81	0.60	0.69	0.30
R062 *	Sulphate (2:1 Water Soluble)	SO_4	g/l	0.013	0.057	0.013	0.12	0.029	0.031	0.042	0.14
R014	Sulphide	S	mg/kg	<10	<10	<10	11	<10	<10	11	12
R201	Sulphur (Elemental)	S	mg/kg	<10	<10	<10	<10	<10	<10	<10	<10
R002	Zinc (Total)	Zn	mg/kg	110	99	93	1200	280	160	200	120

CHECKED AND ISSUED BY: J. Campbell DATE: 16.09.98

Tests marked ' * ' in this report are not included in the UKAS Accreditation Schedule for our laboratory

NAMAS TESTING No. 1928

GIP/4284
Old Hednesford Road, Cannock
GROUND INVESTIGATION & PILING
YOUR REFERENCE 8305
YOUR ORDER NO 14182

TEST METHOD LIST.

Method Number	Method Name
R002	Metals (Total) in Soil
R003	pH in Soil
R004	Cyanide in Soil
R008	Phenols (Total) in Soil
R011	Boron (Water Soluble) in Soil
R014	Sulphide in Soil
R062 *	Sulphate (2:1 Water Soluble) in Soil
R201	Sulphur (Elemental) in Soil
R202	PAH in Soil

CHECKED AND ISSUED BY: J. Campbell DATE: 16.09.98

NOTES ON SITE INVESTIGATION REPORTS

1. *Unless specifically stated, no account has been taken of possible subsidence due to mineral extraction.*

2. *Ground water levels recorded during investigation are subject to the method of drilling, observations, seasonal variations and other influences.*

3. *Comments are based upon conditions revealed by this investigation but it should be noted that the techniques may not disclose all the circumstances of the site.*

4. *Conditions between boreholes have been interpolated to the best of our ability, however, soil and rock conditions are highly variable and may differ from our interpolation. The assessment may be subject to amendment in the light of additional information becoming available.*

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GROUND INVESTIGATION & PILING LIMITED,
153 DIBDALE ROAD, DUDLEY, DY1 2RN TEL(01384) - 455255

APPENDIX B

Appendix B: Limitations Statement

1. This report has been prepared for the exclusive use of Cannock Chase District Council and copyright subsists with Grontmij Limited. Prior written permission must be obtained to reproduce all or part of the report.

2. This report and/or opinions have been prepared for the specific purpose stated in the document. The recommendations should not be used for other schemes on or adjacent to the site without further reference to Grontmij Limited.

3. Observations were made of the site and of structures on the site as indicated within the report.

4. Grontmij has relied upon the existing data provided by Cannock Chase District Council to be accurate, and has not taken steps to independently check the accuracy of the data provided.

5. Our interpretation of any regulatory database information (including the MAGIC and British Geological Survey websites) assumes that the data provided is accurate. A disclaimer provided by database search companies is as follows: '…the data is derived from historical sources or information available in public records or from third parties and is supplied to us without warranty by data suppliers and we cannot warrant the accuracy or completeness of the data or the reports.' We cannot therefore accept any responsibility for the accuracy of the data used in this study, only that its interpretation has been carried out with due skill, care and diligence.

APPENDIX B

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2. This report and/or opinions have been prepared for the specific purpose stated in the document. The recommendations should not be used for other purposes or adjacent sites without further reference to Grontmij Limited.

3. Observations were made of the site and soil arisings as indicated within the report. Where access to portions of the site was unavailable or limited, Grontmij Limited renders no opinion as to the environmental status of such parts of the site.

4. Grontmij has relied upon the existing desktop study data provided by Cannock Chase District Council to be accurate, and has not taken steps to independently check the accuracy of the data provided.

5. Our interpretation of any regulatory database information (including the MAGIC and British Geological Survey websites) within an earlier report, and relied upon in this report, assumes that the data provided is accurate. A disclaimer provided by database search companies is as follows: ' the data is derived from historical sources or information available in public records or from third parties and is supplied to us without warranty by data suppliers and we cannot warrant the accuracy or completeness of the data or the reports.' We cannot therefore accept any responsibility for the accuracy of the data used in this study, only that its interpretation has been carried out with due skill, care and diligence.

6. The conclusions and recommendations submitted in this report are based in part upon the data obtained from soil samples from exploratory holes. The nature and extent of variations between the exploratory holes is inferred in the report and could only be confirmed by further investigation. If variations or other latent conditions become evident, it will be necessary to re-evaluate the recommendations of this report.

7. The generalised soil profile described in the text is intended to convey trends in sub-surface conditions. The boundaries between strata are approximate and idealised and have been developed in interpretations of widely spaced explorations and samples; actual soil transitions may be more gradual. For specific information, refer to the exploration logs.

8. Water levels and/or gas readings have been taken in the borings and/or observation wells at times and under conditions stated on the exploration logs. These data have been reviewed and interpretations have been made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater or gas may occur due to variations in rainfall, atmospheric pressure and other factors different from those prevailing at the time the measurements were made.

9. The conclusions and recommendations of this report are based in part upon various types of chemical analysis of soil, water or gases, and are contingent upon their validity. These data have been reviewed and interpretations made in the report. Variations in the types and concentrations of contaminants and variations in their flow paths may occur due to seasonal water table fluctuations, past disposal practices, the passage of time and other factors. Should additional analytical or monitoring data

become available in the future, these data should be reviewed and conclusions and recommendations presented herein modified accordingly.

10. Chemical analyses have been performed for specific parameters during the course of this study, as detailed in the text. It must be noted that additional constituents not searched for during the current study may be present in soil, groundwater and soil voids at the site.

APPENDIX C

BOREHOLE LOG

Grontmij

BOREHOLE No **BH1**

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	22-09-10 23-09-10			KAS

SAMPLES & TESTS			Water	STRATA				
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Instrument / Backfill
0.00-0.00	ES					0.25	MADE GROUND Grass over brown very silty slightly gravelly fine SAND with frequent rootlets. Gravel is sub-rounded to rounded fine to coarse of quartzite and quartz. (Topsoil)	
0.30-0.30	ES					0.55	MADE GROUND Dark brown and dark orange slightly clayey very sandy angular to sub-rounded fine to coarse GRAVEL of ahale sandstone with occasional brick and rare coal. Rare angular cobbles of sandstone and half bricks.	
0.70-0.70	ES					(1.25)	MADE GROUND Dark grey and grey cemented colliery waste. Recovered as very sandy (fine to coarse) angular fine to coarse GRAVEL of shale and sandstone with rare coal. (Colliery waste)	
						1.80		
						2.00	Brown orange angular fine to coarse GRAVEL of shale and sandstone with rare coal.	
2.00-3.00	ES					(4.00)	Brown orange sandy (fine to coarse) angular fine to coarse GRAVEL of shale and sandstone with rare coal.	
						6.00	End of Hole at 6m bgl.	

Groundwater	General Remarks	Final Depth
Strike Depth: (m) Rising to: (m) Groundwater Remarks None Encountered	Located in grass verge beside rear garden No 17 Linden View. Hand dug pit to 1.00 m bgl.	**6m bgl**

Contractor	Method/ Plant Used	
Sherwood Drilling	Window sampling	All dimensions in metres Scale 1:50 Sheet 1 of 1

GRONTMIJ BOREHOLE LOG CANNOCK RD.GPJ GPJ AGS3 ALL.GDT 3/11/11

BOREHOLE LOG

Grontmij

BOREHOLE No **BH2**

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	24-09-10 24-09-10			KAS

SAMPLES & TESTS			Water	STRATA				
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Instrument / Backfill
0.00-0.00	ES							
0.30-0.30	ES					(0.55) 0.55	MADE GROUND Grass over firm friable dark brown slightly sandy (fine to coarse) gravelly CLAY. Gravel is angular to sub-rounded fine to coarse of shale and quartz. (TOPSOIL)	
0.65-0.65	ES					0.80	MADE GROUND Dark grey very clayey sandy (fine to coarse) GRAVEL. Gravel is angular to sub-angular fine to coarse of shale coal and rare clinker. At 0.65 m bgl piece of timber encountered with strong creosote odour - possible railway sleeper.	
						0.95		
						(0.45) 1.40	MADE GROUND Orange sandy (fine to coarse) angular fine to coarse gravel of brick with occasional half bricks.	
						(0.60) 2.00	MADE GROUND Grey sandy (fine to coarse) angular fine to coarse GRAVEL of shale. Below 1.10 m bgl becomes dark grey.	
2.00-2.30	ES					(0.50) 2.50	MADE GROUND Firm to stiff friable grey gravelly CLAY. Gravel is angular fine to coarse of shale brick and coal. MADE GROUND Dark grey black very clayey sandy (fine to coarse) angular fine to coarse GRAVEL of shale and coal.	
						(0.50) 3.00	No recovery.	
						(0.50) 3.50	Firm brown slightly sandy (fine to coarse) gravelly CLAY. Gravel is angular to sub-angular fine to coarse of shale.	
						(1.00) 4.50	Stiff friable brown gravelly CLAY. Gravel is angular fine to medium of shale coal and rare sandstone.	
						(0.50) 5.00	Grey dark grey clayey sandy (fine to coarse) angular fine to coarse GRAVEL of shale and rare coal.	
							End of Hole at 5m bgl.	

Groundwater	General Remarks	Final Depth
Strike Depth: (m) Rising to: (m) Groundwater Remarks None Encountered	Located in grass area inbetween Nos 11 and 17 stagborough Way. Hand dug pit to 1.00 m bgl.	**5m bgl**

Contractor	Method/ Plant Used	
Sherwood Drilling	Window sampling	All dimensions in metres Scale 1:50

Sheet 1 of 1

GRONTMIJ BOREHOLE LOG CANNOCK RD.GPJ AGS3_ALL.GDT 3/11/11

BOREHOLE LOG

Grontmij

BOREHOLE No **BH3**

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	24-09-10 24-09-10			KAS

SAMPLES & TESTS			Water	STRATA				
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Instrument / Backfill
0.00-0.00	ES					0.10	MADE GROUND Grass over brown silty gravelly fine to medium SAND with rootlets. Gravel is sub-rounded to rounded fine to coarse of quartzite.	
0.30-0.30	ES					(0.60)		
0.60-0.60	ES					0.70	MADE GROUND Brown silty fine to coarse SAND and GRAVEL. Gravel is angular to rounded fine to coarse of quartzite shale and rare brick and half bricks. Below 0.50 m bgl angular medium to coarse angular gravel af sandstone and sandstone cobbles.	
1.00-1.35	ES					1.00	MADE GROUND Dark grey grey very clayey angular fine to coarse GRAVEL of shale clinker and coal. Very rare angular cobbles of clinker.	
						(0.70)		
			1			1.70	MADE GROUND Soft to firm friable dark grey grey gravelly CLAY. Gravel is angular fine to coarse of shale and occasional brick and sandstone.	
							No recovery. Evidence of pink coarse grained sandstone cobble pushed to 3.50 m bgl.	
						(1.80)		
						3.50		
						(0.50)	Light grey cream sandy angular fine to coarse GRAVEL of siltstone and shale.	
						4.00		
						(1.00)	GRAVEL of quartzite and quartz.	
						5.00		
							End of Hole at 5m bgl.	

Groundwater			General Remarks	Final Depth
Strike Depth: (m)	Rising to: (m)	Groundwater Remarks	Located in grass area adjacent to No 1 Herondale. Hand dug pit to 1.00 m bgl.	**5m bgl**
1.9		Standing		

Contractor	Method/ Plant Used	
Sherwood Drilling	Window sampling	All dimensions in metres Scale 1:50

Sheet 1 of 1

GRONTMIJ BOREHOLE LOG CANNOCK RD.GPJ GRONTMIJ BOREHOLE LOG CANNOCK RD.GPJ AGS3_ALL.GDT 3/11/11

WINDOW SAMPLE LOG

WINDOW SAMPLE No: **WS1**

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	20-09-10 20-09-10			KAS

SAMPLES & TESTS			Water	STRATA				
Depth	Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Instrument / Backfill
0.00-0.00	ES					0.30	MADE GROUND Grass over brown very clayey very gravelly slightly silty fine to medium SAND. Gravel is of sub-angular to rounded fine to coarse angular fine coal and angular medium pottery with one piece of tabular metal.	
0.30-0.30	ES						Orange brown very gravelly medium to coarse SAND. Gravel is sub-angular to rounded fine to coarse of quartzite quartz and sandstone. (GLACIAL SAND)	
0.65-0.65	ES					(1.50)		
						1.80		
2.10-2.30	ES					(1.00)	Soft to firm grey blue mottled black slightly gravelly CLAY becoming firm grey mottled black below 2.50 m bgl. Gravel is of angular fine to medium coal tabular angular medium shale and rare angular to sub-angular fine to medium sandstone. (GLACIAL TILL)	
						2.80	End of Hole at 2.8m bgl.	

Groundwater	General Remarks	Final Depth
Strike Depth: (m) Rising to: (m) Groundwater Remarks None Encountered	Located in rear Garden No 44 Swallowfields Drive. Hand dug pit to 1.00 m bgl. Hole terminated at 2.80 m bgl due to refusal.	**2.8m bgl**

Contractor	Method/ Plant Used	
Sherwood Drilling	Hand held window sampling	All dimensions in metres Scale 1:50

Sheet 1 of 1

GRONTMIJ WINDOW SAMPLE LOG 2006 CANNOCK RD.GPJ AGS3_ALL.GDT 3/11/11

WINDOW SAMPLE LOG

WINDOW SAMPLE No **WS10**

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	23-09-10 23-09-10			KAS

SAMPLES & TESTS			Water	STRATA				
Depth	Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Instrument / Backfill
0.00-0.00	ES					0.20	MADE GROUND Decorative gravel and Terram over brown silty slightly gravelly fine to medium SAND. Gravel is sub-rounded - rounded fine to medium of quartzite.	
0.30-0.30	ES					(0.80) 1.00	MADE GROUND Red brown gravelly fine to coarse SAND. Gravel is sub-rounded to rounded fine to coarse of quartzite and quartz. At 0.80 , bgl half concrete block 100mm in diameter encountered.	
0.65-0.65	ES					(0.50) 1.50	Red brown silty fine to medium SAND.	
1.50-2.00	ES					(0.50) 2.00	Light brown fine to medium SAND and GRAVEL. Gravel is sub-rounded to rounded fine to coarse of quartzite.	
							End of Hole at 2m bgl.	

Groundwater	General Remarks	Final Depth
Strike Depth: (m) Rising to: (m) Groundwater Remarks None Encountered	Located in rear Garden No 53 Berry Hill. Hand dug pit to 1.00 m bgl. Hole terminated at 2.00 m bgl due to refusal. Hole collapsed to 1.80 m bgl on completion.	**2m bgl**

Contractor	Method/ Plant Used	
Sherwood Drilling	Hand held window sampling	All dimensions in metres Scale 1:50

Sheet 1 of 1

GRONTMIJ WINDOW SAMPLE LOG 2006 CANNOCK RD.GPJ AGS3_ALL.GDT 3/11/11

WINDOW SAMPLE LOG

WINDOW SAMPLE No **WS11**

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	23-09-10 23-09-10			KAS

SAMPLES & TESTS			Water	STRATA				Instrument / Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.00-0.00	ES					(0.60) 0.60	MADE GROUND Grass over firm becoming soft grey slightly sandy (fine to coarse) gravelly CLAY. Gravel is angular fine to coarse of shale brick coal and clinker with occasional whole bricks.	
0.30-0.30	ES							
0.65-0.65	ES		1			(0.40) 1.00	MADE GROUND Very soft brown gravelly CLAY. Gravel is angular fine to coarse shale coal brick and occasional clinker with some whole bricks.	
						(0.50) 1.50	MADE GROUND Soft dark grey slightly sandy (fine to coarse) slightly gravelly CLAY. Gravel is angular to sub-angular fine to medium of shale coal and sandstone.	
						(1.00) 2.50	MADE GROUND Soft friable dark grey gravelly CLAY. Gravel is angular fine to coarse of coal shale and brick.	
2.50-3.00	ES					(2.00) 4.50	MADE GROUND Brown silty slightly clayey sandy (fine to coarse) angular fine to coarse GRAVEL of shale.	
						(0.50) 5.00	MADE GROUND Soft friable dark grey gravelly CLAY. Gravel is angular fine to coarse of coal shale and brick.	
							End of Hole at 5m bgl.	

Groundwater			General Remarks	Final Depth
Strike Depth: (m)	Rising to: (m)	Groundwater Remarks	Located in rear Garden No 56 Herondale. Hand dug pit to 1.00 m bgl.Standing water at 2.55 m bgl. Hole collapsed to 3.00 m bgl on completion.	**5m bgl**
1		Ground Wet		

Contractor	Method/ Plant Used	
Sherwood Drilling	Hand held window sampling	All dimensions in metres Scale 1:50

Sheet 1 of 1

GRONTMIJ WINDOW SAMPLE LOG 2006 CANNOCK RD.GPJ AGS3_ALL.GDT 3/11/11

WINDOW SAMPLE LOG

WINDOW SAMPLE No **WS12**

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	28-09-10 28-09-10			KAS

SAMPLES & TESTS			Water	STRATA				Instrument / Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.05-0.05	ES					0.05	MADE GROUND Pea gravel over Terram.	
0.30-0.30	ES					0.30	MADE GROUND Very soft friable dark brown gravelly slightly sandy (fine to coarse) CLAY with occasional rootlets. Gravel is angular to sub-angular fine to coarse of shale slate coal brick and quartzite. (TOPSOIL)	
0.60-0.60	ES						MADE GROUND Dark grey very clayey sandy (fine to coarse) angular fine to coarse GRAVEL of shale coal and rare sandstone.From 3.40 m bgl occasional angular fine to medium clinker.	
						(4.70)		
3.00-3.50	ES							
						5.00	End of Hole at 5m bgl.	

Groundwater	General Remarks	Final Depth
Strike Depth: (m) Rising to: (m) Groundwater Remarks None Encountered	Located in rear Garden No 50 Stagborough Way. Hand dug pit to 1.00 m bgl.	**5m bgl**

Contractor	Method/ Plant Used	
Sherwood Drilling	Hand held window sampling	All dimensions in metres Scale 1:50 Sheet 1 of 1

GRONTMIJ WINDOW SAMPLE LOG 2006 CANNOCK RD.GPJ AGS3_ALL.GDT 3/11/11

WINDOW SAMPLE LOG

WINDOW SAMPLE No: **WS13**

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	29-09-10 29-09-10			KAS

SAMPLES & TESTS			Water	STRATA				Instrument / Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.00-0.00	ES					0.10	MADE GROUND Grass over brown clayey slightly gravelly fine SAND. Gravel is of angular fine to medium shale and sub-rounded fine to coarse quartzite, (TOPSOIL)	
0.30-0.30	ES					(0.84)	MADE GROUND Brown silty gravelly fine SAND, Gravel is of angular fine to coarse brick sandstone and shale and sub-rounded fine to coarse quartzite.	
0.65-0.65	ES					0.94		
						0.95	MADE GROUND 10 mm diameter pea gravel. End of Hole at 0.95m bgl.	

Groundwater	General Remarks	Final Depth
Strike Depth: (m) Rising to: (m) Groundwater Remarks None Encountered	Located in rear Garden No 24 Linden View. Hand dug pit to 1.00 m bgl. Hole terminated at 0.95 m bgl due to encountering pipe bedding gravel. Hole relocated.	**0.95m bgl**

Contractor	Method/ Plant Used	
Sherwood Drilling	Hand held window sampling	All dimensions in metres Scale 1:50 Sheet 1 of 1

GRONTMIJ WINDOW SAMPLE LOG 2006 CANNOCK RD.GPJ AGS3_ALL.GDT 3/11/11

WINDOW SAMPLE LOG

WINDOW SAMPLE No: **WS13a**

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	29-09-10 29-09-10			KAS

SAMPLES & TESTS			Water	STRATA				
Depth	Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Instrument / Backfill
						0.10	MADE GROUND Grass over brown clayey slightly gravelly fine SAND. Gravel is of angular fine to medium shale and sub-rounded fine to coarse quartzite. (TOPSOIL)	
						(0.60)		
						0.70	MADE GROUND Brown silty gravelly fine SAND, Gravel is of angular fine to coarse brick sandstone coal and shale and sub-rounded fine to coarse quartzite.	
1.00-1.40	ES					(0.80)	Very stiff desicated red brown CLAY.	
						1.50		
						1.80	Orange brown gravelly medium to coarse SAND. Gravel is sub-rounded to rounded fine to coarse of quartzite.	
							End of Hole at 1.8m bgl.	

Groundwater	General Remarks	Final Depth
Strike Depth: (m) Rising to: (m) Groundwater Remarks None Encountered	Located in rear Garden No 24 Linden View. Hand dug pit to 1.00 m bgl. Hole terminated at 1.80 m bgl due to refusal.	**1.8m bgl**

Contractor	Method/ Plant Used	
Sherwood Drilling	Hand held window sampling	All dimensions in metres Scale 1:50 Sheet 1 of 1

GRONTMIJ WINDOW SAMPLE LOG 2006 CANNOCK RD.GPJ AGS3_ALL.GDT 3/11/11

WINDOW SAMPLE LOG

WINDOW SAMPLE No: **WS14**

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	29-09-10 29-09-10			KAS

SAMPLES & TESTS			Water	STRATA				
Depth	Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Instrument / Backfill
0.00-0.00	ES					0.05	MADE GROUND (MULCH) Dark brown peat	
0.30-0.30	ES						Dark grey to black silty sandy (fine to coarse) angular fine to coarse GRAVEL of shale.	
0.65-0.65	ES					(1.75)		
						1.80		
2.00-2.50	ES						Orange silty sandy (fine to coarse) angular fine to coarse GRAVEL of shale.	
						(1.60)		
						3.40		
							Purple and grey sandy (fine to coarse) angular fine to coarse GRAVEL of shale.	
						(1.60)		
						5.00		
							End of Hole at 5m bgl.	

Groundwater	General Remarks	Final Depth
Strike Depth: (m) Rising to: (m) Groundwater Remarks None Encountered	Located in rear Garden No 65 Stagborough Way. Hand dug pit to 1.00 m bgl. Poor recovery from 4.00 m gl to 5.00 m bgl. Hole collapsed to 3.00 m bgl on completion.	**5m bgl**

Contractor	Method/ Plant Used	
Sherwood Drilling	Hand held window sampling	All dimensions in metres Scale 1:50 Sheet 1 of 1

GRONTMIJ WINDOW SAMPLE LOG 2006 CANNOCK RD.GPJ AGS3_ALL.GDT 3/11/11

WINDOW SAMPLE LOG

WINDOW SAMPLE No: **WS15**

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	30-09-10 30-09-10			KAS

SAMPLES & TESTS			Water	STRATA				Instrument / Backfill
Depth	Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.00-0.00	ES					0.10	Dark brown silty gravelly fine SAND with rootlets. Gravel is angular to sub-rounded fine to medium of brick and quartz. (MADE GROUND)	
0.30-0.30	ES					(0.90)	Brown clayey gravelly fine to medium SAND. Gravel is angular to sub-rounded fine to coarse of brick shale sandstone and quartzite. (MADE GROUND)	
0.60-0.60	ES					1.00		
1.00-1.50	ES					(1.00)	Soft to firm friable dark grey brown sandy (fine to coarse) gravelly CLAY. Gravel is angular to sub-rounded fine to coarse of shale sandstone and quartzite with rare clinker. (MADE GROUND)	
						2.00		
						(1.00)	Brown very clayey angular medium GRAVEL of quartz.	
						3.00	End of Hole at 3m bgl.	

Groundwater	General Remarks	Final Depth
Strike Depth: (m) Rising to: (m) Groundwater Remarks None Encountered	Located in rear Garden No 12 Swallowfields Drive. Hand dug pit to 1.00 m bgl. Poor recovery from 2.00 m bgl to 3.00 m bgl. Hole collapsed to 1.80 m bgl on completion.	**3m bgl**

Contractor	Method/ Plant Used	
Sherwood Drilling	Hand held window sampling	All dimensions in metres Scale 1:50 Sheet 1 of 1

GRONTMIJ WINDOW SAMPLE LOG 2006 CANNOCK RD.GPJ AGS3_ALL.GDT 3/11/11

WINDOW SAMPLE LOG

WINDOW SAMPLE No **WS16**

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	30-09-10 30-09-10			KAS

SAMPLES & TESTS			Water	STRATA				
Depth	Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Instrument / Backfill
0.00-0.00	ES					0.05	MADE GROUND Grass over brown very silty fine to medium SAND with frequent rootlets (TOPSOIL)	
0.30-0.30	ES					(0.75)	MADE GROUND Light brown clayey sandy slightly cobbley angular to rounded GRAVEL of quartzite brick and concrete. Cobbles are angular to sub-rounded of concrete and quartzite.	
0.60-0.60	ES					0.80		
1.00-1.50	ES						Red brown slightly silty gravelly fine to coarse SAND. Gravel is sub-rounded to rounded fine to coarse of quartzite and quartz. Below 1.20 m bgl becoming clayey.	
						(2.20)		
						3.00	End of Hole at 3m bgl.	

Groundwater	General Remarks	Final Depth
Strike Depth: (m) Rising to: (m) Groundwater Remarks None Encountered	Located in rear Garden 110 Stafford Lane. Hand dug pit to 1.00 m bgl. Hole terminated at 3.00 m bgl due to refusal. Hole collapsed to 1.80 m bgl on completion.	**3m bgl**

Contractor	Method/ Plant Used	
Sherwood Drilling	Hand held window sampling	All dimensions in metres Scale 1:50 Sheet 1 of 1

GRONTMIJ WINDOW SAMPLE LOG 2006 CANNOCK RD.GPJ AGS3_ALL.GDT 3/11/11

WINDOW SAMPLE LOG

WINDOW SAMPLE No: **WS2**

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	20-09-10 20-09-10			KAS

SAMPLES & TESTS			Water	STRATA				
Depth	Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Instrument / Backfill
0.00-0.00	ES					0.30	Grass over brown very clayey gravelly silty fine to medium SAND. Gravel is of tabular angular fine to coarse shale and sub-angular to sub-rounded fine to coarse quartzite and sandstone.	
0.30-0.30	ES					0.50	Firm friable grey brown slightly sandy (fine to coarse) gravelly CLAY. Gravel is of angular fine to medium shale sub-angular to sub-rounded fine to coarse sandstone and quartzite and angular fine to medium coal. (GLACIAL TILL)	
0.60-0.60	ES						Grey and red orange clayey sandy angular fine to coarse GRAVEL of shale and coal with occasional angular ironstone and shale cobbles. Coal rare between 0.75 and 1.40 m bgl. (GLACIAL GRAVEL)	
1.50-1.70	ES					(2.15)		
						2.65	End of Hole at 2.65m bgl.	

Groundwater	General Remarks	Final Depth
Strike Depth: (m) Rising to: (m) Groundwater Remarks None Encountered	Located in rear Garden No 32 Berry Hill. Hand dug pit to 1.00 m bgl. Hole terminated at 2.65 m bgl due to refusal.	**2.65m bgl**

Contractor	Method/ Plant Used	
Sherwood Drilling	Hand held window sampling	All dimensions in metres Scale 1:50 Sheet 1 of 1

GRONTMIJ WINDOW SAMPLE LOG 2006 CANNOCK RD.GPJ AGS3_ALL.GDT 3/11/11

WINDOW SAMPLE LOG

WINDOW SAMPLE No: **WS3**

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	20-09-10 20-09-10			KAS

SAMPLES & TESTS			Water	STRATA				
Depth	Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Instrument / Backfill
0.00-0.00	ES					(0.50) 0.50	MADE GROUND Brown very silty slightly gravelly fine to medium SAND with rootlets. Gravel is of sub-rounded fine to medium quartzite and sandstone and angular fine to medium brick. (TOPSOIL)	
0.30-0.30	ES					0.65	Brown slightly clayey fine to medium SAND and GRAVEL. Gravel is sub-angular to rounded fine to coarse of quartzite and sandstone with occasional sub-angular to sub-rounded cobbles of quartzite and sandstone.	
0.65-0.65	ES					(0.95) 1.60	Orange brown locally stained black slightly clayey fine to medium SAND and GRAVEL. Gravel is sub-angular to rounded fine to coarse of quartzite and sandstone with occasional sub-angular to sub-rounded cobbles of quartzite and sandstone. Occasional dark brown black cobble size cemented clasts of gravel cement appearing iron rich. (POSSIBLE MADE GROUND)	
1.20-1.50	ES					(0.40) 2.00	Light brown slightly silty fine to coarse SAND and GRAVEL. Gravel is sub-rounded to rounded fine to coarse of quartzite and quartz.	
							End of Hole at 2m bgl.	

Groundwater	General Remarks	Final Depth
Strike Depth: (m) Rising to: (m) Groundwater Remarks None Encountered	Located in rear Garden No 15 Berry Hill. Hand dug pit to 1.00 m bgl. Hole terminated at 2.00 m bgl due to refusal. Hole collapsed to 1.40 m bgl on completion.	**2m bgl**

Contractor	Method/ Plant Used	
Sherwood Drilling	Hand held window sampling	All dimensions in metres Scale 1:50 Sheet 1 of 1

GRONTMIJ WINDOW SAMPLE LOG 2006 CANNOCK RD.GPJ AGS3_ALL.GDT 3/11/11

WINDOW SAMPLE LOG

WINDOW SAMPLE No: **WS4**

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	21-09-10 21-09-10			KAS

SAMPLES & TESTS			Water	STRATA				
Depth	Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Instrument / Backfill
0.00-0.00	ES					0.30	MADE GROUND Dark brown and black very silty clayey slightly gravelly fine to medium SAND with frequent rootlets. Gravel is sub-rounded fine to medium of quartzite with occasional brick.	
0.35-0.35	ES					0.60	MADE GROUND Dark brown silty sandy (fine to coarse) cobbley GRAVEL of sub-angular to rounded fine to medium quartzite and angular fine to coarse bricks and sandstone. Cobbles are angular of sandstone and whole and half bricks.	
0.65-0.65	ES					(0.60) 1.20	MADE GROUND Soft friable dark grey gravelly CLAY. Gravel is of angular sub-rounded fine to mediumsandstone and angular fine to medium coal and angular fine to coarse shale.	
						(0.40) 1.60		
1.65-1.85	ES					1.65	MADE GROUND Light brown silty medium to coarse SAND and GRAVEL. Gravel is sub-angular to sub-rounded fine to medium of sandstone shale brick and occasional clinker.	
						(0.95)	MADE GROUND Dark purple angular to sub-rounded fine to coarse GRAVEL of brick.	
						2.60	MADE GROUND Orange fine to coarse SAND and GRAVEL. Gravel is angular fine to medium of shale brick and occasional clinker.	
						(0.40) 3.00	No Recovery	
						(0.50) 3.50	MADE GROUND Orange fine to coarse SAND and GRAVEL. Gravel is angular fine to medium of shale brick and occasional clinker.	
3.50-3.80	ES		▼1			(1.10) 4.60	MADE GROUND Black and dark brown sandy angular to sub-angular fine to coarse GRAVEL of clinker with occasional coarse gravel size pockets of black sandy (fine) silt.	
						(0.40) 5.00	Blue grey becoming light blue below 4.75 m bgl slightly clayey gravelly fine to coarse SAND. Gravel is sub-angular to rounded fine to coarse of quartzite and quartz. (POSSIBEL NATURAL GROUND)	
							End of Hole at 5m bgl.	

Groundwater

Strike Depth: (m)	Rising to: (m)	Groundwater Remarks
3.8		Ground Damp

General Remarks

Located in rear Garden No 8 Stagborough Way. Hand dug pit to 1.00 m bgl. No recovery between 2.60 to 3.00 m bgl. Hole collapsed to 3.50 m bgl on completion.

Final Depth

5m bgl

Contractor: Sherwood Drilling

Method/ Plant Used: Hand held window sampling

All dimensions in metres Scale 1:50

Sheet 1 of 1

GRONTMIJ WINDOW SAMPLE LOG 2006 CANNOCK RD.GPJ AGS3_ALL.GDT 3/11/11

WINDOW SAMPLE LOG

WINDOW SAMPLE No: **WS5**

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	21-09-10 21-09-10			KAS

SAMPLES & TESTS			Water	STRATA				
Depth	Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Instrument / Backfill
0.00-0.00	ES					0.25	Brown clayey silty fine SAND with rootlets. (TOPSOIL)	
0.30-0.30	ES					(0.95)	Brown clayey sandy (fine to coarse) GRAVEL of shale with occasional cobble size clasts.	
0.65-0.65	ES					1.20		
1.30-1.55	ES					(1.30)	Grey and black very clayey angular to sub-angular fine to coarse GRAVEL of shale and sandstone.	
						2.50	End of Hole at 2.5m bgl.	

Groundwater	General Remarks	Final Depth
Strike Depth: (m) Rising to: (m) Groundwater Remarks None Encountered	Located in rear Garden No 73 Stagborough Way. Hand dug pit to 1.00 m bgl. Hole terminated at 2.50 m bgl due to refusal.	**2.5m bgl**

Contractor	Method/ Plant Used	
Sherwood Drilling	Hand held window sampling	All dimensions in metres Scale 1:50 Sheet 1 of 1

GRONTMIJ WINDOW SAMPLE LOG 2006 CANNOCK RD.GPJ AGS3_ALL.GDT 3/11/11

WINDOW SAMPLE LOG

WINDOW SAMPLE No: **WS6**

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	21-09-10 21-09-10			KAS

SAMPLES & TESTS			Water	STRATA				
Depth	Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Instrument / Backfill
0.00-0.00	ES					0.30	MADE GROUND Black and dark broan silty peaty fine SAND with frequent rootlets (TOPSOIL)	
0.35-0.35	ES					0.45	MADE GROUND Light brown fine sandy sub-angular to rounded fine to coarse GRAVEL of quartzite and sandstone.	
0.70-0.70	ES					(1.40)	MADE GROUND Brown silty very gravelly fine to medium SAND with rare coarse gravel size pockets of grey brown gravelly clay. Gravel is of angular fine to coarse shale sub-angular to rounded fine to coarse quartzite and sandstone and angular fine to coarse concrete with occasional cobbles of quartzite. Below 1.00 m bgl concrete absent. Below 1.50 m bgl shale becomes infrequent.	
						1.85		
						2.00	Firm friable dark grey slightly gravelly CLAY. Gravel is angular fine of shale and coal.	
							End of Hole at 2m bgl.	

Groundwater	General Remarks	Final Depth
Strike Depth: (m) Rising to: (m) Groundwater Remarks None Encountered	Located in rear Garden No 37 Stagborough Way.Excavated in raised bed 200 mm above surrounding ground level Hand dug pit to 1.00 m bgl. Hole terminated at 2.00 m bgl due to refusal.	**2m bgl**

Contractor	Method/ Plant Used	
Sherwood Drilling	Hand held window sampling	All dimensions in metres Scale 1:50 Sheet 1 of 1

GRONTMIJ WINDOW SAMPLE LOG 2006 CANNOCK RD.GPJ AGS3_ALL.GDT 3/11/11

WINDOW SAMPLE LOG

WINDOW SAMPLE No **WS7**

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	22-09-10 22-09-10			KAS

SAMPLES & TESTS			Water	STRATA				
Depth	Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Instrument / Backfill
0.00-0.00	ES					0.25	MADE GROUND Dark brown peaty silty fine SAND with frequent roots and rootlets. (TOPSOIL)	
0.30-0.30	ES					0.55	MADE GROUND Stiff becoming firm below 0.45 m bgl red brown gravelly CLAY. Gravel is of angular fine to coarse brick sub-rounded to rounded fine to coarse quartzite angular fine to medium coal with occasional sub-rounded to rounded quartzite cobbles.	
0.70-0.70	ES					(0.95)	Stiff red brown slightly gravelly CLAY. Gravel is sub-rounded to rounded fine to coarse of quartz and quartzite with rare angular fine coal and occasional sub-rounded to rounded cobbles of quartzite. (POSSIBLE GLACIAL TILL)	
1.10-1.50	ES					1.50	Firm red brown CLAY with occasional sandy (fine) partings. (GLACIAL TILL)	
						(0.50) 2.00	End of Hole at 2m bgl.	

Groundwater	General Remarks	Final Depth
Strike Depth: (m) Rising to: (m) Groundwater Remarks None Encountered	Located in rear Garden No 17 Swallowfields Drive. Hand dug pit to 1.00 m bgl. Hole terminated at 2.00 m bgl due to refusal.	**2m bgl**

Contractor	Method/ Plant Used	
Sherwood Drilling	Hand held window sampling	All dimensions in metres Scale 1:50 Sheet 1 of 1

GRONTMIJ WINDOW SAMPLE LOG 2006 CANNOCK RD.GPJ AGS3_ALL.GDT 3/11/11

WINDOW SAMPLE LOG

WINDOW SAMPLE No: **WS8**

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	23-09-10 23-09-10			KAS

SAMPLES & TESTS			Water	STRATA				Instrument
Depth	Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Backfill
0.00-0.00	ES					0.10	Dark brown and brown silty peaty slightly gravelly fine SAND with frequent rootlets. Gravel is sub-rounded to rounded fine to medium of quartzite and quartz. (TOPSOIL)	
0.30-0.30	ES					(0.50)		
0.65-0.65	ES					0.60	Brown slightly clayey very gravelly fine to medium SAND. Gravel is sub-rounded to rounded fine to coarse of quartzite and quartz with some sandstone and occasional sub-angular to sub-rounded cobbles of quartzite.	
						(0.90)	Red brown silty fine to medium SAND.	
1.50-1.80	ES					1.50	Red brown fine to coarse SAND and GRAVEL. Gravel is sub-rounded to rounded fine to coarse of quartz and quartzite.	
						1.80	End of Hole at 1.8m bgl.	

Groundwater	General Remarks	Final Depth
Strike Depth: (m) Rising to: (m) Groundwater Remarks None Encountered	Located in rear Garden No 31 Berry Hill. Hand dug pit to 1.00 m bgl. Hole terminated at 1.80 m bgl due to refusal.	**1.8m bgl**

Contractor	Method/ Plant Used	
Sherwood Drilling	Hand held window sampling	All dimensions in metres Scale 1:50 Sheet 1 of 1

GRONTMIJ WINDOW SAMPLE LOG 2006 CANNOCK RD.GPJ AGS3_ALL.GDT 3/11/11

WINDOW SAMPLE LOG

WINDOW SAMPLE No **WS9**

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	23-09-10 23-09-10			KAS

SAMPLES & TESTS			Water	STRATA				
Depth	Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Instrument / Backfill
0.00-0.00	ES					0.05	MADE GROUND Grass over brown sandy (fine to coarse) clayey SILT with frequent rootlets. (TOPSOIL)	
0.30-0.30	ES					0.35	MADE GROUND Firm friable red brown slightly sandy (fine to coarse) gravelly CLAY. Gravel is of sub-rounded to rounded fine to coarse quartzite angular fine to medium coal and clinker and angular fine to coarse shale with occasional sub-rounded to rounded cobbles of quartzite.	
0.65-0.65	ES					(1.65)	Stiff red brown gravelly CLAY. Gravel is sub-rounded to rounded fine to coarse of quartzite quartz and sandstone with occasional sub-rounded cobbles of quartzite. Below 1.00 m bgl becoming sandy (fine to medium). (MADE GROUND - POSSIBLE RE-WORKED GLACIAL TILL)	
1.00-1.40	ES					2.00	End of Hole at 2m bgl.	

Groundwater	General Remarks	Final Depth
Strike Depth: (m) Rising to: (m) Groundwater Remarks None Encountered	Located in rear Garden No 41 Swallowfields Drive. Hand dug pit to 1.00 m bgl.	**2m bgl**

Contractor	Method/ Plant Used	
Sherwood Drilling	Hand held window sampling	All dimensions in metres Scale 1:50 Sheet 1 of 1

GRONTMIJ WINDOW SAMPLE LOG 2006 CANNOCK RD.GPJ AGS3_ALL.GDT 3/11/11

HAND PIT LOG

Grontmij

HAND PIT No: HP1

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	22-09-10 22-09-10			KAS

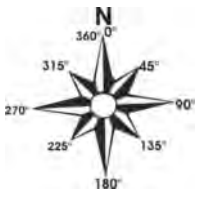
SAMPLES & TESTS			Water	STRATA				
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Backfill
0.00-0.00	ES					0.10	MADE GROUND Grass over light brown very silty slightly gravelly fine SAND with frequent rootlets. Gravel is sub-rounded to rounded fine to medium with occasional coarse quartzite clasts.	
0.30-0.30	ES					(0.60)		
						0.70	MADE GROUND Weakly cemented light brown becoming red brown below 0.35 m bgl very gravelly fine to coarse SAND. Gravel is sub-rounded to rounded fine to coarse of quartzite and quartz with rare cobbles of quartzite.	
0.70-0.70	ES					0.75	Black silty fine organic rich SAND with frequent rootlets and clumps of decaying grass. (RELICT TOPSOIL)	
						1.10	Brown slightly clayey gravelly fine to coarse SAND. Gravel is sub-rounded to rounded fine to coarse of quartzite and quartz.	
							End of Trial Pit at 1.1m bgl.	

Hand Pit Length = **m**

Hand Pit Width = **m**

HAND PIT DIMENSIONS

A B C D



Bearing from North = °

Shoring	Stability

Groundwater Strike Depth: (m) Rising to: (m) Groundwater Remarks	General Remarks Located in rear Garden No 27 Stagborough Way.	Final Depth
None Encountered		**1.1m bgl**

Contractor	Method/ Plant Used	
Sherwood Drilling	Hand Tools	All dimensions in metres Scale 1:50 Sheet 1 of 1

GRONTMIJ HAND PIT LOG CANNOCK RD.GPJ AGS3_ALL.GDT 3/11/11

HAND PIT LOG

Grontmij

HAND PIT No: HP10

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	04-10-10 04-10-10			KAS

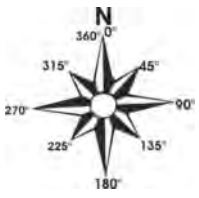
SAMPLES & TESTS			Water	STRATA				
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Backfill
0.00-0.00	ES					0.10	MADE GROUND Grass over brown very silty gravelly fine SAND with frequent rootlets. Gravel is of angular fine to medium shale and brick and sub-rounded fine to medium quartzite. (TOPSOIL)	
0.30-0.30	ES					0.40 0.55	MADE GROUND Dark grey and brown very clayey gravel of angular fine to coarse shale coal occasional brick and sub-rounded fine to medium quartzite.	
0.60-0.60	ES					(0.45) 1.00	MADE GROUND Firm to stiff red brown sandy (fine to coarse) gravelly CLAY. Gravel is of angular fine to coarse shale brick and coal and sub-rounded fine to coarse quartzite.	
							MADE GROUND Dark grey and black very clayey angular to subangular fine to coarse GRAVEL of shale and coal.	
							End of Trial Pit at 1m bgl.	

Hand Pit Length = **m**

Hand Pit Width = **m**

A / B / C / D

HAND PIT DIMENSIONS



Bearing from North = °

Shoring	Stability

Groundwater Strike Depth: (m) Rising to: (m) Groundwater Remarks	General Remarks	Final Depth
None Encountered	Located in rear Garden No 14 Meadow Lark Close.	**1m bgl**

Contractor	Method/ Plant Used	
Sherwood Drilling	Hand Tools	All dimensions in metres Scale 1:50

Sheet 1 of 1

GRONTMIJ HAND PIT LOG CANNOCK RD.GPJ AGS3_ALL.GDT 3/11/11

HAND PIT LOG

Grontmij

HAND PIT No: HP11

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	04-10-10 04-10-10			KAS

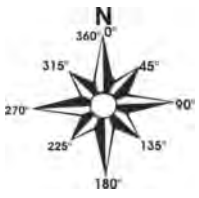
SAMPLES & TESTS			Water	STRATA				
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Backfill
0.30-0.30 0.35-0.35 0.65-0.65	ES ES ES					0.30 (0.70) 1.00	MADE GROUND Black brown clayey silty slightly gravelly fine SAND with rootlets. Gravel is sub-rounded fine to coarse of quartz and quartzite. (TOPSOIL) MADE GROUND Red brown very clayey sandy (fine to coarse) gravel of angular fine to coarse shale and sub-angular to sub-rounded fine to coarse sandstone with occasional angular fine to medium coal. End of Trial Pit at 1m bgl.	

Hand Pit Length = **m**

Hand Pit Width = **m**

HAND PIT DIMENSIONS

A / B / C / D



Bearing from North = °

Shoring	Stability

Groundwater Strike Depth: (m) Rising to: (m) Groundwater Remarks	General Remarks Located in rear Garden 4 Chaffinch Close.	Final Depth
None Encountered		**1m bgl**

Contractor	Method/ Plant Used	
Sherwood Drilling	Hand Tools	All dimensions in metres Scale 1:50 Sheet 1 of 1

GRONTMIJ HAND PIT LOG CANNOCK RD.GPJ AGS3_ALL.GDT 3/11/11

HAND PIT LOG

HAND PIT No: HP2

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	03-10-10 03-10-10			KAS

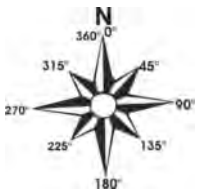
SAMPLES & TESTS			Water	STRATA				
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Backfill
0.00-0.00	ES					0.05	MADE GROUND Igneous aggregate over Terram.	
0.05-0.05	ES					0.25	MADE GROUND Brown clayey gravelly fine to coarse SAND. Gravel is sub-rounded to rounded fine to coarse of quartzite.	
0.30-0.30	ES					0.60	MADE GROUND Red brown very gravelly fine to coarse SAND. Gravel is of angular fine to coarse brick and concrete and sub-rounded to rounded fine to coarse of quartzite. Occasional whole and half bricks.	
0.65-0.65	ES					(0.40) 1.00	Red brown very clayey gravelly fine to coarse SAND. Gravel is of angular fine to coarse shale and sub-rounded fine to coarse quartzite.	
							End of Trial Pit at 1m bgl.	

Hand Pit Length = **m**

Hand Pit Width = **m**

HAND PIT DIMENSIONS

A / B / C / D



Bearing from North = °

Shoring	Stability

Groundwater Strike Depth: (m) Rising to: (m) Groundwater Remarks	General Remarks Located in rear Garden No 35 Linden View.	Final Depth
None Encountered		**1m bgl**

Contractor	Method/ Plant Used	
Sherwood Drilling	Hand Tools	All dimensions in metres Scale 1:50 Sheet 1 of 1

GRONTMIJ HAND PIT LOG CANNOCK RD.GPJ GRONTMIJ_AGS3_ALL.GDT 3/11/11

HAND PIT LOG

Grontmij

HAND PIT No: HP3

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	03-10-10 03-10-10			KAS

SAMPLES & TESTS			Water	STRATA				
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Backfill
						0.25	Grass over dark brown very silty slightly gravelly fine to medium SAND with rootlets. Gravel is sub-rounded fine to medium of quartz.	
0.65-0.65	ES					(0.75) 1.00	Red brown very clayey fine to coarse SAND and GRAVEL. Gravel is sub-rounded to rounded fine to coarse of quartzite and quartz with occasional sub-rounded quartzite cobbles.	
							End of Trial Pit at 1m bgl.	

Hand Pit Length = **m**

Hand Pit Width = **m**

HAND PIT DIMENSIONS

A / B / C / D

N 360° 0° 45° 90° 135° 180° 225° 270° 315°

Bearing from North = °

Shoring	Stability

Groundwater Strike Depth: (m) Rising to: (m) Groundwater Remarks	General Remarks	Final Depth
None Encountered	Located in rear Garden No 42 Berry Hill.	**1m bgl**

Contractor	Method/ Plant Used	
Sherwood Drilling	Hand Tools	All dimensions in metres Scale 1:50

Sheet 1 of 1

GRONTMIJ HAND PIT LOG CANNOCK RD.GPJ AGS3_ALL.GDT 3/11/11

HAND PIT LOG

Grontmij

HAND PIT No: HP4

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	03-10-10 03-10-10			KAS

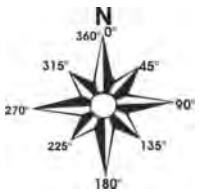
SAMPLES & TESTS			Water	STRATA				
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Backfill
0.00-0.00	ES					0.30	MADE GROUND Grass over dark brown very clayey slightly gravelly fine organic rich SAND with rootlets. Gravel is sub-rounded fine to coarse of quartz and quartzite with occasional fragments of rusty metal. (TOPSOIL)	
0.30-0.30	ES					(0.70)	Stiff red brown slightly gravelly slightly sandy (fine to coarse) CLAY. Gravel is of sub-rounded to rounded fine to coarse quartzite and quartz and angular fine shale. (POSSIBLE GLACIAL TILL)	
0.35-0.35	ES					1.00	End of Trial Pit at 1m bgl.	
0.65-0.65	ES							

Hand Pit Length = **m**

Hand Pit Width = **m**

HAND PIT DIMENSIONS

A / B / C / D



Bearing from North = °

Shoring	Stability

Groundwater Strike Depth: (m) Rising to: (m) Groundwater Remarks	General Remarks	Final Depth
None Encountered	Located in rear Garden No 49 Swallowfields Drive.	**1m bgl**

Contractor	Method/ Plant Used	
Sherwood Drilling	Hand Tools	All dimensions in metres Scale 1:50

Sheet 1 of 1

GRONTMIJ HAND PIT LOG CANNOCK RD.GPJ AGS3_ALL.GDT 3/11/11

HAND PIT LOG

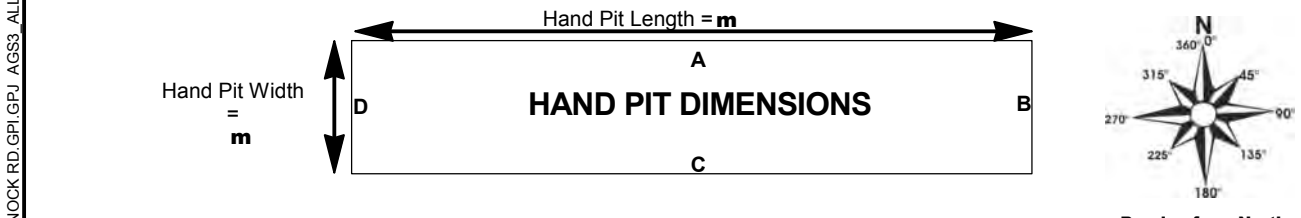
Grontmij

HAND PIT No: HP5

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	03-10-10 03-10-10			KAS

SAMPLES & TESTS			Water	STRATA				
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Backfill
0.00-0.00	ES					0.15	Dark brown very silty fine organic SAND with rootlets. (TOPSOIL)	
0.30-0.30	ES					(0.65)	Red brown slightly clayey fine to coarse SAND and GRAVEL. Gravel is sub-rounded to rounded fine to coarse of quartzite and quartz with rare sub-rounded quartzite cobbles.	
0.65-0.65	ES					0.80		
						1.00	Firm red brown gravelly CLAY. Gravel is sub-rounded fine to medium of quartzite.	
							End of Trial Pit at 1m bgl.	



Bearing from North = °

Shoring	Stability

Groundwater Strike Depth: (m) Rising to: (m) Groundwater Remarks	General Remarks	Final Depth
None Encountered	Located in rear Garden No 9 Berry Hill.	1m bgl

Contractor	Method/ Plant Used	
Sherwood Drilling	Hand Tools	All dimensions in metres Scale 1:50 Sheet 1 of 1

GRONTMIJ HAND PIT LOG CANNOCK RD.GPJ AGS3_ALL.GDT 3/11/11

HAND PIT LOG

Grontmij

HAND PIT No: HP6

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	03-10-10 03-10-10			KAS

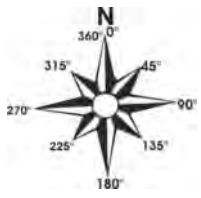
SAMPLES & TESTS			Water	STRATA				
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Backfill
0.00-0.00	ES					0.10	MADE GROUND Dark brown very clayey fine organic SAND. (TOPSOIL)	
0.30-0.30	ES					(0.40) 0.50	Dark brown very clayey very gravelly fine to coarse SAND. Gravel is of angular fine to coarse shale and brick sub-angular to sub-rounded fine to coarse sandstone and sub-rounded to rounded fine to coarse quartzite and quartz with rare angular fine to medium coal. (MADE GROUND)	
0.65-0.65	ES					(0.50) 1.00	Firm friable orange brown gravelly CLAY. Gravel is angular fine to coarse of shale.	
							End of Trial Pit at 1m bgl.	

Hand Pit Length = **m**

Hand Pit Width = **m**

HAND PIT DIMENSIONS

A B C D



Bearing from North = °

Shoring	Stability

Groundwater Strike Depth: (m) Rising to: (m) Groundwater Remarks	General Remarks	Final Depth
None Encountered	Located in rear Garden No 10 Berry Hill.	**1m bgl**

Contractor	Method/ Plant Used	
Sherwood Drilling	Hand Tools	All dimensions in metres Scale 1:50

Sheet 1 of 1

GRONTMIJ HAND PIT LOG CANNOCK RD.GPJ AGS3_ALL.GDT 3/11/11

HAND PIT LOG

Grontmij

HAND PIT No: HP7

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	03-10-10 03-10-10			KAS

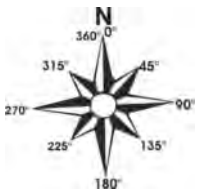
SAMPLES & TESTS			Water	STRATA				
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Backfill
0.00-0.00	ES					(0.40) 0.40	Brown very silty slightly gravelly fine SAND with frequent roots and rootlets. Gravel is sub-rounded fine to coarse of quartzite. (TOPSOIL)	
0.30-0.30	ES							
0.60-0.60	ES					(0.60) 1.00	Dark grey very clayey sandy angular to sub-rounded fine to coarse GRAVEL of shale and sandstone.	
							End of Trial Pit at 1m bgl.	

Hand Pit Length = **m**

Hand Pit Width = **m**

HAND PIT DIMENSIONS

A / B / C / D



Bearing from North = °

Shoring	Stability

Groundwater Strike Depth: (m) Rising to: (m) Groundwater Remarks	General Remarks	Final Depth
None Encountered	Located in rear Garden No 97 Stagborough Way.	**1m bgl**

Contractor	Method/ Plant Used	
Sherwood Drilling	Hand Tools	All dimensions in metres Scale 1:50 Sheet 1 of 1

GRONTMIJ HAND PIT LOG CANNOCK RD.GPJ AGS3_ALL.GDT 3/11/11

HAND PIT LOG

Grontmij

HAND PIT No: HP8

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	03-10-10 03-10-10			KAS

SAMPLES & TESTS			Water	STRATA				
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Backfill
0.00-0.00	ES					0.20	MADE GROUND Grass over brown clayey silty slightly gravelly fine SAND with rootlets. Gravel is sub-rounded to rounded fine to coarse of quartzite.	
0.30-0.30	ES					(0.80)	Red brown silty gravelly fine to coarse SAND. Gravel is sub-rounded to rounded fine to coarse of quartzite with some angular coarse brick and angular to sub-angular fine to coarse sandstone. Occasional sub-rouned cobbles of quartzite. Brick absent below 0.30 m bgl.	
0.65-0.65	ES		1			1.00	End of Trial Pit at 1m bgl.	

Hand Pit Length = **m**

Hand Pit Width = **m**

HAND PIT DIMENSIONS

A / B / C / D

N 360° 0° 45° 90° 135° 180° 225° 270° 315°

Bearing from North = °

Shoring	Stability

Groundwater			General Remarks	Final Depth
Strike Depth: (m)	Rising to: (m)	Groundwater Remarks	Located in rear Garden No 27 Linden View.	**1m bgl**
1		Ground waterlogged		

Contractor	Method/ Plant Used	
Sherwood Drilling	Hand Tools	All dimensions in metres Scale 1:50

Sheet 1 of 1

GRONTMIJ HAND PIT LOG CANNOCK RD.GPJ AGS3_ALL.GDT 3/11/11

HAND PIT LOG

HAND PIT No: HP9

Project	Client	Logged By
East Cannock Road	Cannock Chase DC	MJH

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
103912-002	04-10-10 04-10-10			KAS

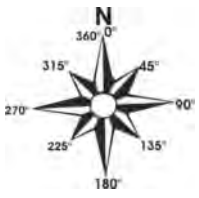
SAMPLES & TESTS			Water	STRATA				
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Backfill
0.00-0.00	ES					0.25	MADE GROUND Grass over brown very silty slightly gravelly fine SAND with frequent rootlets and occasional roots. Gravel is of sub-rounded fine to medium quartzite and angular fine to medium sanstone shale and rare brick. (TOPSOIL)	
0.30-0.30	ES					(0.75)	MADE GROUND Firm friable grey gravelly CLAY with occasional roots. Gravel is of angular to sub-angular fine to coarse shale sub-angular to sub-rounded fine to coarse sandstone and angular fine to medium clinker.	
0.65-0.65	ES					1.00	End of Trial Pit at 1m bgl.	

Hand Pit Length = **m**

Hand Pit Width = **m**

HAND PIT DIMENSIONS

A / B / C / D



Bearing from North = °

Shoring	Stability

Groundwater Strike Depth: (m) Rising to: (m) Groundwater Remarks	General Remarks	Final Depth
None Encountered	Located in rear Garden No 38 Swallowfields Drive.	**1m bgl**

Contractor	Method/ Plant Used	
Sherwood Drilling	Hand Tools	All dimensions in metres Scale 1:50

Sheet 1 of 1

GRONTMIJ HAND PIT LOG CANNOCK RD.GPJ GRONTMIJ_AGS3_ALL.GDT 3/11/11

Hand Dug Pits - 20/6/11. Logged by: RH

S01	
0 - 0.1m	MADE GROUND: Brown sandy gravelly clay topsoil with many roots. Gravel is fine to course subangular to subrounded quartz, brick, limestone and ash
0.1-0.5m	MADE GROUND: Brown sandy gravelly clay. Gravel is medium to coarse subangular to subrounded brick, tile, quartz, sandstone, ash and clinker.
0.5m	End of hand pit

S02	
0 - 0.07m	MADE GROUND: Brown sandy gravelly clay topsoil with many roots. Gravel is fine to course subangular to subrounded quartz, brick, limestone and ash
0.07-0.3m	MADE GROUND: Brown sandy gravelly clay. Gravel is medium to coarse subangular to subrounded brick, tile, quartz, sandstone, ash and clinker.
0.3m	Hand pit aborted - solid obstruction

S03	
0 - 0.05m	MADE GROUND: Brown sandy topsoil
0.05 - 0.2m	MADE GROUND: Brown sandy gravelly clay. Gravel is fine to coarse subangular to subrounded brick, quartz, burnt shale. Metal wire observed at 0.2m.
0.2m	Hand pit aborted - strata too stiff to penetrate with spade

S04	
0 - 0.05m	MADE GROUND: Brown sandy topsoil
0.05 - 0.2m	MADE GROUND: Brown sandy gravelly clay. Gravel is medium to coarse subangular to subrounded brick, tile, quartz, sandstone, ash and clinker.
0.2 - 0.25m	Possible MADE GROUND: Stiff brown clay with gravel of coal
0.25m	Hand pit aborted - strata too stiff to penetrate with spade

S05	
0 - 0.1m	MADE GROUND: Brown sandy, slightly gravelly topsoil
0.1 - 0.45m	Possible MADE GROUND: Brown fine to medium slightly clayey sand with some fine to medium subangular to subrounded gravel of quartz, sandstone and some coal
0.45m	Hand pit aborted - strata too stiff to penetrate with spade

APPENDIX D

ALcontrol Laboratories

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: mkt@alcontrol.com
Website: www.alcontrol.com

Grontmij
Radcliffe House
3rd Floor
Blenheim Court, Lode lane
Solihull
West Midlands
B912AA

Attention: Gareth Taylor

CERTIFICATE OF ANALYSIS

Date:	18 October 2010		
Customer:	H_GRONTMIJ_SOL-27		
Sample Delivery Group (SDG):	101004-23	**Report No.:**	100214
Your Reference:			
Location:	Stagborough		

We received 20 samples on Saturday October 02, 2010 and 8 of these samples were scheduled for analysis which was completed on Friday October 15, 2010. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Iain Swinton

Operations Director - Land UK & Ireland

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

UKAS TESTING
1291

GROUP

Validated

ALcontrol Laboratories Analytical Services

SDG:	101004-23	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100214

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
2180866	WS12		0.30	28/09/2010
2180910	WS12		3.00 - 3.50	28/09/2010
2180692	WS13		0.65	29/09/2010
2180960	WS14		0.65	29/09/2010
2180787	WS15		0.60	30/09/2010
2180811	WS15		1.00 - 1.50	30/09/2010
2180594	WS16			30/09/2010
2180626	WS16		0.30	30/09/2010

Only received samples which have had analysis scheduled will be shown on the following pages.

Validated

ALcontrol Laboratories Analytical Services

SDG:	101004-23	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100214

SOLID

Results Legend

X Test

N No Determination Possible

			Lab Sample No(s)	2180594	2180626	2180692	2180787	2180811	2180886	2180910	2180960
			Customer Sample Ref.	WS16	WS16	WS13	WS15	WS15	WS12	WS12	WS14
			AGS Ref.								
			Depth (m)		0.30	0.65	0.60	1.00 - 1.50	0.30	3.00 - 3.50	0.65
			Container	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	60g VOC	250g Amber Jar	400g Tub	250g Amber Jar	60g VOC	250g Amber Jar	400g Tub
Asbestos Containing Material Screen	All	NDPs: 0 Tests: 1					X												
Boron Water Soluble	All	NDPs: 0 Tests: 6	X		X		X				X							X	
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0 Tests: 2							X				X						
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 2							X				X						
GRO by GC-FID (S)	All	NDPs: 0 Tests: 2								X							X		
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 6		X		X		X				X							X
Metals by iCap-OES (Soil)	Arsenic	NDPs: 0 Tests: 6	X		X		X				X							X	
	Barium	NDPs: 0 Tests: 6	X		X		X				X							X	
	Beryllium	NDPs: 0 Tests: 6	X		X		X				X							X	
	Cadmium	NDPs: 0 Tests: 6	X		X		X				X							X	
	Chromium	NDPs: 0 Tests: 6	X		X		X				X							X	
	Copper	NDPs: 0 Tests: 6	X		X		X				X							X	
	Lead	NDPs: 0 Tests: 6	X		X		X				X							X	
	Mercury	NDPs: 0 Tests: 6	X		X		X				X							X	
	Nickel	NDPs: 0 Tests: 6	X		X		X				X							X	
	Selenium	NDPs: 0 Tests: 6	X		X		X				X							X	

Validated

ALcontrol Laboratories Analytical Services

SDG:	101004-23	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100214

SOLID

Results Legend

X Test

N No Determination Possible

			Lab Sample No(s)	2180594		2180626		2180692		2180787		2180811		2180886		2180910		2180960	
			Customer Sample Ref.	WS16		WS16		WS13		WS15		WS15		WS12		WS12		WS14	
			AGS Ref.																
			Depth (m)			0.30		0.65		0.60		1.00 - 1.50		0.30		3.00 - 3.50		0.65	
			Container	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	60g VOC	250g Amber Jar	400g Tub	250g Amber Jar	60g VOC	250g Amber Jar	400g Tub
Metals by iCap-OES (Soil)	Vanadium	NDPs: 0 Tests: 6		X		X		X		X				X				X	
	Zinc	NDPs: 0 Tests: 6		X		X		X		X				X				X	
pH	All	NDPs: 0 Tests: 6			X		X		X		X				X				X
Sample description	All	NDPs: 0 Tests: 8		X		X		X		X		X		X		X		X	
Semi Volatile Organic Compounds	All	NDPs: 0 Tests: 2										X				X			
Total Organic Carbon	All	NDPs: 0 Tests: 6		X		X		X		X				X				X	
TPH CWG GC (S)	All	NDPs: 0 Tests: 2										X				X			
VOC MS (S)	All	NDPs: 0 Tests: 2											X				X		

Validated

ALcontrol Laboratories Analytical Services

SDG:	101004-23	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100214

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Grain size	Inclusions	Inclusions 2
2180594	WS16		Dark Brown	Sand	0.1 - 2 mm	Stones	Vegetation
2180626	WS16	0.30	Dark Brown	Sand	0.1 - 2 mm	Stones	Vegetation
2180692	WS13	0.65	Dark Brown	Sand	0.1 - 2 mm	Stones	N/A
2180787	WS15	0.60	Dark Brown	Sandy Clay Loam	0.1 - 2 mm	Crushed Brick	Vegetation
2180811	WS15	1.00 - 1.50	Dark Brown	Sandy Loam	0.1 - 2 mm	Stones	Vegetation
2180866	WS12	0.30	Grey	Silty Clay Loam	0.063 - 0.1 mm	Stones	None
2180910	WS12	3.00 - 3.50	Dark Brown	Sandy Clay	0.1 - 2 mm	Stones	N/A
2180960	WS14	0.65	Black	Sand	0.1 - 2 mm	Stones	N/A

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Validated

ALcontrol Laboratories Analytical Services

SDG	101004-23	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100214

Test Completion Dates

Lab Sample No(s)	2180594	2180626	2180692	2180787	2180811	2180866	2180910	2180960
Customer Sample Ref.	WS16	WS16	WS13	WS15	WS15	WS12	WS12	WS14
AGS Ref.								
Depth		0.30	0.65	0.60	1.00 - 1.50	0.30	3.00 - 3.50	0.65
Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Asbestos Containing Material Screen				11/10/2010				
Boron Water Soluble	11/10/2010	11/10/2010	11/10/2010	13/10/2010		12/10/2010		11/10/2010
EPH CWG (Aliphatic) GC (S)					13/10/2010		13/10/2010	
EPH CWG (Aromatic) GC (S)					13/10/2010		13/10/2010	
GRO by GC-FID (S)					12/10/2010		12/10/2010	
Hexavalent Chromium (s)	11/10/2010	11/10/2010	11/10/2010	13/10/2010		11/10/2010		11/10/2010
Metals by iCap-OES (Soil)	12/10/2010	12/10/2010	12/10/2010	14/10/2010		12/10/2010		12/10/2010
pH	11/10/2010	11/10/2010	11/10/2010	12/10/2010		13/10/2010		13/10/2010
Sample description	08/10/2010	08/10/2010	08/10/2010	08/10/2010	08/10/2010	08/10/2010	08/10/2010	08/10/2010
Semi Volatile Organic Compounds					13/10/2010		13/10/2010	
Total Organic Carbon	11/10/2010	11/10/2010	11/10/2010	13/10/2010		12/10/2010		11/10/2010
TPH CWG GC (S)					13/10/2010		13/10/2010	
VOC MS (S)					15/10/2010		15/10/2010	

Validated

ALcontrol Laboratories Analytical Services

SDG	101004-23	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100214

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	WS12	WS13	WS14	WS15
			Depth (m)	0.30	0.65	0.65	0.60
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	28/09/2010	29/09/2010	29/09/2010	30/09/2010
			Date Received	02/10/2010	02/10/2010	02/10/2010	02/10/2010
			SDG Ref	101004-23	101004-23	101004-23	101004-23
			Lab Sample No.(s)	2180866	2180692	2180960	2180787
			AGS Reference				
Asbestos Containing Material Screen	-	TM001					No ACM Detected
Soil Organic Matter (SOM)	<0.35 %	TM132		9.41 #	1.59 #	10.7 #	5.76 #
pH	1 pH Units	TM133		5.88 M	8.61 M	6.93 M	7.96 M
Chromium, Hexavalent	<0.6 mg/kg	TM151		<0.6 #	<0.6 #	<0.6 #	<0.6 #
Arsenic	<0.6 mg/kg	TM181		10.4 M	7.37 M	8.28 M	10.4 M
Barium	<0.6 mg/kg	TM181		216 #	84.4 #	126 #	108 #
Beryllium	<0.01 mg/kg	TM181		1.76	0.711	2.47	1.18 M
Cadmium	<0.02 mg/kg	TM181		1.37 M	0.465 M	2.18 M	0.852 M
Chromium	<0.9 mg/kg	TM181		14.4 M	13 M	19.8 M	20.2 M
Copper	<1.4 mg/kg	TM181		57.5 M	18 M	57.6 M	31.2 M
Lead	<0.7 mg/kg	TM181		45.3 M	19 M	88.8 M	35.8 M
Mercury	<0.14 mg/kg	TM181		0.245 M	0.463 M	0.277 M	<0.14 M
Nickel	<0.2 mg/kg	TM181		36.4 M	16.3 M	47.5 M	27 M
Selenium	<1 mg/kg	TM181		1.81 #	<1 #	1.33 #	1.18 #
Vanadium	<0.2 mg/kg	TM181		28.1 #	17.7 #	29.1 #	24.7 #
Zinc	<1.9 mg/kg	TM181		231 M	54.7 M	1090 M	174 M
Boron, water soluble	<1 mg/kg	TM222		4.36 M	<1 M	1.19 M	1.3 M

SDG	101004-23	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100214

Semi Volatile Organic Compounds

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	WS12	WS15
			Depth (m)	3.00 - 3.50	1.00 - 1.50
			Sample Type	Soil/Solid	Soil/Solid
			Date Sampled	28/09/2010	30/09/2010
			Date Received	02/10/2010	02/10/2010
			SDG Ref	101004-23	101004-23
			Lab Sample No.(s)	2180910	2180811
			AGS Reference		
Phenol	<100 µg/kg	TM157		<100	<100
Pentachlorophenol	<100 µg/kg	TM157		<100	<100
n-Nitroso-n-dipropylamine	<100 µg/kg	TM157		<100	<100
Nitrobenzene	<100 µg/kg	TM157		<100	<100
Isophorone	<100 µg/kg	TM157		<100	<100
Hexachloroethane	<100 µg/kg	TM157		<100	<100
Hexachlorocyclopentadiene	<100 µg/kg	TM157		<100	<100
Hexachlorobutadiene	<100 µg/kg	TM157		<100	<100
Hexachlorobenzene	<100 µg/kg	TM157		<100	<100
n-Dioctyl phthalate	<100 µg/kg	TM157		<100	<100
Dimethyl phthalate	<100 µg/kg	TM157		<100	<100
Diethyl phthalate	<100 µg/kg	TM157		<100	<100
n-Dibutyl phthalate	<100 µg/kg	TM157		<100	<100
Dibenzofuran	<100 µg/kg	TM157		<100	<100
Carbazole	<100 µg/kg	TM157		<100	<100
Butylbenzyl phthalate	<100 µg/kg	TM157		<100	<100
bis(2-Ethylhexyl) phthalate	<100 µg/kg	TM157		149	1920
bis(2-Chloroethoxy)methane	<100 µg/kg	TM157		<100	<100
bis(2-Chloroethyl)ether	<100 µg/kg	TM157		<100	<100
Azobenzene	<100 µg/kg	TM157		<100	<100
4-Nitrophenol	<100 µg/kg	TM157		<100	<100
4-Nitroaniline	<100 µg/kg	TM157		<100	<100
4-Methylphenol	<100 µg/kg	TM157		<100	<100
4-Chlorophenylphenylether	<100 µg/kg	TM157		<100	<100
4-Chloroaniline	<100 µg/kg	TM157		<100	<100
4-Chloro-3-methylphenol	<100 µg/kg	TM157		<100	<100
4-Bromophenylphenylether	<100 µg/kg	TM157		<100	<100
3-Nitroaniline	<100 µg/kg	TM157		<100	<100
2-Nitrophenol	<100 µg/kg	TM157		<100	<100
2-Nitroaniline	<100 µg/kg	TM157		<100	<100
2-Methylphenol	<100 µg/kg	TM157		<100	<100
1,2,4-Trichlorobenzene	<100 µg/kg	TM157		<100	<100
2-Chlorophenol	<100 µg/kg	TM157		<100	<100
2,6-Dinitrotoluene	<100 µg/kg	TM157		<100	<100
2,4-Dinitrotoluene	<100 µg/kg	TM157		<100	<100
2,4-Dimethylphenol	<100 µg/kg	TM157		<100	<100
2,4-Dichlorophenol	<100 µg/kg	TM157		<100	<100
2,4,6-Trichlorophenol	<100 µg/kg	TM157		<100	<100
2,4,5-Trichlorophenol	<100 µg/kg	TM157		<100	<100

ALcontrol Laboratories Analytical Services

SDG	101004-23	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100214

Semi Volatile Organic Compounds

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	WS12	WS15
			Depth (m)	3.00 - 3.50	1.00 - 1.50
			Sample Type	Soil/Solid	Soil/Solid
			Date Sampled	28/09/2010	30/09/2010
			Date Received	02/10/2010	02/10/2010
			SDG Ref	101004-23	101004-23
			Lab Sample No.(s)	2180910	2180811
			AGS Reference		
1,4-Dichlorobenzene	<100 µg/kg	TM157		<100	<100
1,3-Dichlorobenzene	<100 µg/kg	TM157		<100	<100
1,2-Dichlorobenzene	<100 µg/kg	TM157		<100	<100
2-Chloronaphthalene	<100 µg/kg	TM157		<100	<100
2-Methylnaphthalene	<100 µg/kg	TM157		383	168
Acenaphthylene	<100 µg/kg	TM157		<100	<100
Acenaphthene	<100 µg/kg	TM157		<100	<100
Anthracene	<100 µg/kg	TM157		<100	<100
Benzo(a)anthracene	<100 µg/kg	TM157		<100	162
Benzo(b)fluoranthene	<100 µg/kg	TM157		<100	124
Benzo(k)fluoranthene	<100 µg/kg	TM157		<100	<100
Benzo(a)pyrene	<100 µg/kg	TM157		<100	129
Benzo(g,h,i)perylene	<100 µg/kg	TM157		<100	<100
Chrysene	<100 µg/kg	TM157		149	198
Fluoranthene	<100 µg/kg	TM157		251	374
Fluorene	<100 µg/kg	TM157		<100	<100
Indeno(1,2,3-cd)pyrene	<100 µg/kg	TM157		<100	<100
Phenanthrene	<100 µg/kg	TM157		539	507
Pyrene	<100 µg/kg	TM157		215	321
Naphthalene	<100 µg/kg	TM157		399	<100
Dibenzo(a,h)anthracene	<100 µg/kg	TM157		<100	<100

SDG	101004-23	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100214

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	WS12	WS15
			Depth (m)	3.00 - 3.50	1.00 - 1.50
			Sample Type	Soil/Solid	Soil/Solid
			Date Sampled	28/09/2010	30/09/2010
			Date Received	02/10/2010	02/10/2010
			SDG Ref	101004-23	101004-23
			Lab Sample No.(s)	2180910	2180811
			AGS Reference		
Aliphatics >C12-C16	<100 µg/kg	TM173		40300	16500
Aliphatics >C16-C21	<100 µg/kg	TM173		34100	9510
Aliphatics >C21-C35	<100 µg/kg	TM173		79800	26200
Aliphatics >C35-C44	<100 µg/kg	TM173		13100	3750
Aromatics >EC12-EC16	<100 µg/kg	TM173		41100	11500
Aromatics >EC16-EC21	<100 µg/kg	TM173		86900	25200
Aromatics >EC21-EC35	<100 µg/kg	TM173		264000	68500
Aromatics >EC35-EC44	<100 µg/kg	TM173		76300	25500
Aromatics >EC40-EC44	<100 µg/kg	TM173		28000	10600
Total Aliphatics >C12-C44	<100 µg/kg	TM173		167000	56000
Total Aromatics >EC12-EC44	<100 µg/kg	TM173		468000	131000
Total Aliphatics >C5-35	<100 µg/kg	TM173		154000	52300
Total Aliphatics >C5-C44	<100 µg/kg	TM173		167000	56000
Total Aromatics >C5-35	<100 µg/kg	TM173		392000	105000
Total Aromatics >C6-C44	<100 µg/kg	TM173		468000	131000
Total Aliphatics & Aromatics >C5-35	<100 µg/kg	TM173		546000	158000
Total Aliphatics & Aromatics >C5-C44	<100 µg/kg	TM173		636000	187000
GRO Surrogate % recovery**	%	TM089		14	29
GRO >C5-C12	<44 µg/kg	TM089		<44	90.9
Methyl tertiary butyl ether (MTBE)	<5 µg/kg	TM089		<5 #	<5 #
Benzene	<10 µg/kg	TM089		<10 M	<10 M
Toluene	<2 µg/kg	TM089		<2 M	11.5 M
Ethylbenzene	<3 µg/kg	TM089		<3 M	19.6 M
m,p-Xylene	<6 µg/kg	TM089		<6 M	<6 M
o-Xylene	<3 µg/kg	TM089		<3 M	<3 M
Aliphatics >C5-C6	<10 µg/kg	TM089		<10	<10
Aliphatics >C6-C8	<10 µg/kg	TM089		<10	11.5
Aliphatics >C8-C10	<10 µg/kg	TM089		<10	11.5
Aliphatics >C10-C12	<10 µg/kg	TM089		<10	12.7
Total Aliphatics >C5-C12	<10 µg/kg	TM089		26	38
Aromatics >EC5-EC7	<10 µg/kg	TM089		<10	<10
Aromatics >EC7-EC8	<10 µg/kg	TM089		<10	11.5
Aromatics >EC8-EC10	<10 µg/kg	TM089		<10	27.6
Aromatics >EC10-EC12	<10 µg/kg	TM089		<10	<10
Total Aromatics >EC5-EC12	<10 µg/kg	TM089		16.5	52.9
m,p,o-Xylene	<10 µg/kg	TM089		<10	<10
BTEX, Total	<10 µg/kg	TM089		<10	31.1

ALcontrol Laboratories Analytical Services

SDG	101004-23	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100214

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	WS12	WS15
			Depth (m)	3.00 - 3.50	1.00 - 1.50
			Sample Type	Soil/Solid	Soil/Solid
			Date Sampled	28/09/2010	30/09/2010
			Date Received	02/10/2010	02/10/2010
			SDG Ref	101004-23	101004-23
			Lab Sample No.(s)	2180910	2180811
			AGS Reference		
Dibromofluoromethane**	%	TM116		83.8	100
Toluene-d8**	%	TM116		76.4	86.5
4-Bromofluorobenzene**	%	TM116		153	151
Dichlorodifluoromethane	<4 µg/kg	TM116		<4 M	<4 M
Chloromethane	<7 µg/kg	TM116		<7 #	<7 #
Vinyl Chloride	<10 µg/kg	TM116		<10 #	<10 #
Bromomethane	<13 µg/kg	TM116		<13 M	<13 M
Chloroethane	<14 µg/kg	TM116		<14 M	<14 M
Trichlorofluorormethane	<6 µg/kg	TM116		<6 M	<6 M
1.1-Dichloroethene	<10 µg/kg	TM116		<10 #	<10 #
Carbon Disulphide	<7 µg/kg	TM116		9.09 M	23.3 M
Dichloromethane	<10 µg/kg	TM116		<10 #	<10 #
Methyl Tertiary Butyl Ether	<11 µg/kg	TM116		<11 M	<11 M
trans-1-2-Dichloroethene	<11 µg/kg	TM116		<11 M	<11 M
1.1-Dichloroethane	<8 µg/kg	TM116		<8 M	<8 M
cis-1-2-Dichloroethene	<5 µg/kg	TM116		<5 M	<5 M
2.2-Dichloropropane	<12 µg/kg	TM116		<12 M	<12 M
Bromochloromethane	<14 µg/kg	TM116		<14 M	<14 M
Chloroform	<8 µg/kg	TM116		<8 M	<8 M
1.1.1-Trichloroethane	<7 µg/kg	TM116		<7 M	<7 M
1.1-Dichloropropene	<11 µg/kg	TM116		<11 M	<11 M
Carbontetrachloride	<14 µg/kg	TM116		<14 M	<14 M
1.2-Dichloroethane	<5 µg/kg	TM116		<5 M	<5 M
Benzene	<9 µg/kg	TM116		<9 M	27 M
Trichloroethene	<9 µg/kg	TM116		<9 M	<9 M
1.2-Dichloropropane	<12 µg/kg	TM116		<12 M	<12 M
Dibromomethane	<9 µg/kg	TM116		<9 M	<9 M
Bromodichloromethane	<7 µg/kg	TM116		<7 M	<7 M
cis-1-3-Dichloropropene	<14 µg/kg	TM116		<14 M	<14 M
Toluene	<5 µg/kg	TM116		11.4 M	23.5 M
trans-1-3-Dichloropropene	<14 µg/kg	TM116		<14	<14
1.1.2-Trichloroethane	<10 µg/kg	TM116		<10 M	<10 M
1.3-Dichloropropane	<7 µg/kg	TM116		<7 #	<7 #
Tetrachloroethene	<5 µg/kg	TM116		<5 M	<5 M
Dibromochloromethane	<13 µg/kg	TM116		<13 M	<13 M
1.2-Dibromoethane	<12 µg/kg	TM116		<12 M	<12 M
Chorobenzene	<5 µg/kg	TM116		<5 M	<5 M
1.1.1.2-Tetrachloroethane	<10 µg/kg	TM116		<10 M	<10 M
Ethylbenzene	<4 µg/kg	TM116		33.7 M	29.8 M

SDG	101004-23	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100214

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Customer Sample Ref.	WS12	WS15
Depth (m)	3.00 - 3.50	1.00 - 1.50
Sample Type	Soil/Solid	Soil/Solid
Date Sampled	28/09/2010	30/09/2010
Date Received	02/10/2010	02/10/2010
SDG Ref	101004-23	101004-23
Lab Sample No.(s)	2180910	2180811
AGS Reference		

Component	LOD/Units	Method		
p/m-Xylene	<14 µg/kg	TM116	20.8 #	<14 #
o-Xylene	<10 µg/kg	TM116	<10 M	<10 M
Styrene	<10 µg/kg	TM116	<10 M	<10 M
Bromoform	<10 µg/kg	TM116	<10 M	<10 M
Isopropylbenzene	<5 µg/kg	TM116	<5 M	<5 M
1.1.2.2-Tetrachloroethane	<10 µg/kg	TM116	<10 #	<10 #
1.2.3-Trichloropropane	<17 µg/kg	TM116	<17 M	<17 M
Bromobenzene	<10 µg/kg	TM116	<10 M	<10 M
Propylbenzene	<11 µg/kg	TM116	<11 M	<11 M
2-Chlorotoluene	<9 µg/kg	TM116	<9 M	<9 M
1.3.5-Trimethylbenzene	<8 µg/kg	TM116	<8 #	<8 #
4-Chlorotoluene	<12 µg/kg	TM116	<12 M	<12 M
tert-Butylbenzene	<12 µg/kg	TM116	<12 #	<12 #
1.2.4-Trimethylbenzene	<9 µg/kg	TM116	<9 #	<9 #
sec-Butylbenzene	<10 µg/kg	TM116	<10 M	<10 M
4-Isopropyltoluene	<11 µg/kg	TM116	<11 M	<11 M
1.3-Dichlorobenzene	<6 µg/kg	TM116	<6 M	<6 M
1.4-Dichlorobenzene	<5 µg/kg	TM116	<5 M	<5 M
n-Butylbenzene	<10 µg/kg	TM116	<10 M	<10 M
1.2-Dichlorobenzene	<12 µg/kg	TM116	<12 M	<12 M
1.2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M	<14 M
Tert-amyl methyl ether	<15 µg/kg	TM116	<15	<15
1.2.4-Trichlorobenzene	<6 µg/kg	TM116	<6 #	<6 #
Hexachlorobutadiene	<12 µg/kg	TM116	<12	<12
Naphthalene	<13 µg/kg	TM116	<13 M	<13 M
1.2.3-Trichlorobenzene	<6 µg/kg	TM116	<6 M	<6 M

Validated

ALcontrol Laboratories Analytical Services

SDG	101004-23	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100214

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	
			Depth (m)	
			Sample Type	
			Date Sampled	
			Date Received	
			SDG Ref	
			Lab Sample No.(s)	
			AGS Reference	
Soil Organic Matter (SOM)	<0.35 %	TM132	2.1 #	1.76 #
pH	1 pH Units	TM133	5.83 M	5.63 M
Chromium, Hexavalent	<0.6 mg/kg	TM151	0.683 #	<0.6 #
Arsenic	<0.6 mg/kg	TM181	7.03 M	5.89 M
Barium	<0.6 mg/kg	TM181	70.3 #	81.4 #
Beryllium	<0.01 mg/kg	TM181	0.685	0.694
Cadmium	<0.02 mg/kg	TM181	0.467 M	0.371 M
Chromium	<0.9 mg/kg	TM181	18 M	16.3 M
Copper	<1.4 mg/kg	TM181	31 M	19.3 M
Lead	<0.7 mg/kg	TM181	24 M	20.5 M
Mercury	<0.14 mg/kg	TM181	0.555 M	0.438 M
Nickel	<0.2 mg/kg	TM181	16.3 M	14.8 M
Selenium	<1 mg/kg	TM181	<1 #	<1 #
Vanadium	<0.2 mg/kg	TM181	22.5 #	20.2 #
Zinc	<1.9 mg/kg	TM181	66.7 M	57.8 M
Boron, water soluble	<1 mg/kg	TM222	<1 M	<1 M

	WS16	WS16
Depth (m)		0.30
Sample Type	Soil/Solid	Soil/Solid
Date Sampled	30/09/2010	30/09/2010
Date Received	02/10/2010	02/10/2010
SDG Ref	101004-23	101004-23
Lab Sample No.(s)	2180594	2180626
AGS Reference		

Table of Results - Appendix

SDG Number : 101004-23 **Client :** H_GRONTMIJ_SOL **Client Ref :**

REPORT KEY

Results expressed as (e.g.) 1.03E-07 is equivalent to 1.03x10-7

NDP	No Determination Possible	#	ISO 17025 Accredited	*	Subcontracted Test	M	MCERTS Accredited
NFD	No Fibres Detected	PFD	Possible Fibres Detected	»	Result previously reported (Incremental reports only)	EC	Equivalent Carbon (Aromatics C8-C35)

Note: Method detection limits are not always achievable due to various circumstances beyond our control

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
PM001		Preparation of Samples for Metals Analysis		
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material		
TM001	In - house Method	Determination of asbestos containing material by screening on solids		
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)		
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS		
TM132	In - house Method	ELTRA CS800 Operators Guide		
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter		
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser		
TM157	HP 6890 Gas Chromatograph (GC) system and HP 5973 Mass Selective Detector (MSD).	Determination of SVOC in Soils by GC-MS extracted by sonication in DCM/Acetone		
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID		
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES		
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer		

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

APPENDIX

APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH_4 by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. Results relate only to the items tested
13. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 – 130 %.
14. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).
16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
18. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
19. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKE	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM	LIQUID/LIQUID SHAKE	GC MS
TRIAZINE HERBS	DCM	LIQUID/LIQUID SHAKE	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	NONE	DIRECT INJECTION	GC FID

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

ALcontrol Laboratories

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Grontmij
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Blenheim Court, Lode lane
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West Midlands
B912AA

Attention: Gareth Taylor

CERTIFICATE OF ANALYSIS

Date:	18 October 2010		
Customer:	H_GRONTMIJ_SOL-27		
Sample Delivery Group (SDG):	100927-62	**Report No.:**	100308
Your Reference:			
Location:	Stagborough		

We received 35 samples on Saturday September 25, 2010 and 18 of these samples were scheduled for analysis which was completed on Monday October 18, 2010. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Iain Swinton

Operations Director - Land UK & Ireland

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

UKAS TESTING
1291

GROUP

Validated

ALcontrol Laboratories Analytical Services

SDG:	100927-62	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100308

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
2154248	BH1			22/09/2010
2154250	BH1		0.30	22/09/2010
2154246	BH1		0.70	22/09/2010
2154247	BH1		2.00 - 3.00	22/09/2010
2154256	BH2			24/09/2010
2154255	BH2		0.30	24/09/2010
2154254	BH2		0.65	24/09/2010
2154257	BH2		2.00 - 2.30	24/09/2010
2154262	BH3			24/09/2010
2154261	BH3		0.30	24/09/2010
2154260	BH3		0.60	24/09/2010
2154263	BH3		1.00 - 1.35	24/09/2010
2154266	HP1			22/09/2010
2154267	HP1		0.30	22/09/2010
2154265	HP1		0.70	22/09/2010
2154292	WS10			23/09/2010
2154291	WS10		0.30	23/09/2010
2154290	WS10		0.65	23/09/2010
2154289	WS10		1.50 - 2.00	23/09/2010
2154300	WS11			23/09/2010
2154298	WS11		0.30	23/09/2010
2154296	WS11		0.65	23/09/2010
2154297	WS11		2.50 - 3.00	23/09/2010
2154273	WS7			22/09/2010
2154269	WS7		0.30	22/09/2010
2154270	WS7		0.70	22/09/2010
2154272	WS7		1.10 - 1.50	22/09/2010
2154279	WS8			23/09/2010
2154278	WS8		0.30	23/09/2010
2154276	WS8		0.65	23/09/2010
2154277	WS8		1.50 - 1.80	23/09/2010
2154283	WS9			23/09/2010
2154281	WS9		0.30	23/09/2010
2154282	WS9		0.65	23/09/2010
2154286	WS9		1.00 - 1.40	23/09/2010

Only received samples which have had analysis scheduled will be shown on the following pages.

Validated

ALcontrol Laboratories Analytical Services

SDG:	100927-62	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100308

SOLID

Results Legend

X Test

N No Determination Possible

Lab Sample No(s)			2154247		2154248		2154254			2154256		2154257		2154260		2154263			2154265		2154269		2154273		2154278		2154281			2154282		2154290		2154296		2154297		2154298		2154300		
Customer Sample Ref.			BH1		BH1		BH2			BH2		BH2		BH3		BH3			HP1		WS7		WS7		WS8		WS9			WS9		WS10		WS11		WS11		WS11		WS11		
AGS Ref.																																										
Depth (m)			2.00 - 3.00				0.65					2.00 - 2.30		0.60		1.00 - 1.35			0.70		0.30				0.30		0.30			0.65		0.65		0.65		2.50 - 3.00		0.30				
Container			250g Amber Jar	60g VOC	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	60g VOC	250g Amber Jar	400g Tub	250g Amber Jar	60g VOC	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	60g VOC	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	60g VOC	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	60g VOC	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	60g VOC
Asbestos Containing Material Screen	All	NDPs: 0 Tests: 5						X							X													X							X	X						
Boron Water Soluble	All	NDPs: 0 Tests: 15			X		X			X				X		X			X		X		X		X		X			X		X		X				X		X		
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 4						X							X													X							X							
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0 Tests: 6					X					X				X											X									X				X		
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 6					X					X				X											X									X				X		
GRO by GC-FID (S)	All	NDPs: 0 Tests: 6							X				X					X											X								X					X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 15				X		X			X				X		X			X		X		X		X		X			X		X		X				X		X	
Metals by iCap-OES (Soil)	Antimony	NDPs: 0 Tests: 3					X							X													X															
	Arsenic	NDPs: 0 Tests: 15			X		X			X				X		X			X		X		X		X		X			X		X		X				X		X		
	Barium	NDPs: 0 Tests: 15			X		X			X				X		X			X		X		X		X		X			X		X		X				X		X		
	Beryllium	NDPs: 0 Tests: 15			X		X			X				X		X			X		X		X		X		X			X		X		X				X		X		
	Cadmium	NDPs: 0 Tests: 15			X		X			X				X		X			X		X		X		X		X			X		X		X				X		X		
	Chromium	NDPs: 0 Tests: 15			X		X			X				X		X			X		X		X		X		X			X		X		X				X		X		
	Copper	NDPs: 0 Tests: 15			X		X			X				X		X			X		X		X		X		X			X		X		X				X		X		
	Lead	NDPs: 0 Tests: 15			X		X			X				X		X			X		X		X		X		X			X		X		X				X		X		
	Mercury	NDPs: 0 Tests: 15			X		X			X				X		X			X		X		X		X		X			X		X		X				X		X		

Validated

ALcontrol Laboratories Analytical Services

SDG:	100927-62	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100308

SOLID

Results Legend

X Test

N No Determination Possible

			Lab Sample No(s)	2154247	2154248	2154254	2154256	2154257	2154260	2154263	2154265	2154269	2154273	2154278	2154281	2154282	2154290	2154296	2154297	2154298	2154300
			Customer Sample Ref.	BH1	BH1	BH2	BH2	BH2	BH3	BH3	HP1	WS7	WS7	WS8	WS9	WS9	WS10	WS11	WS11	WS11	WS11
			AGS Ref.																		
			Depth (m)	2.00 - 3.00		0.65		2.00 - 2.30	0.60	1.00 - 1.35	0.70	0.30		0.30	0.30	0.65	0.65	0.65	2.50 - 3.00	0.30	
			Container	250g Amber Jar	60g VOC	250g Amber Jar	400g Tub	250g Amber Jar	60g VOC	250g Amber Jar	400g Tub	250g Amber Jar	60g VOC	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	60g VOC	250g Amber Jar	400g Tub	250g Amber Jar	60g VOC
Metals by iCap-OES (Soil)	Nickel	NDPs: 0 Tests: 15		X		X		X		X		X		X		X		X		X		X		X		X		X	
	Selenium	NDPs: 0 Tests: 15		X		X		X		X		X		X		X		X		X		X		X		X		X	
	Vanadium	NDPs: 0 Tests: 15		X		X		X		X		X		X		X		X		X		X		X		X		X	
	Zinc	NDPs: 0 Tests: 15		X		X		X		X		X		X		X		X		X		X		X		X		X	
pH	All	NDPs: 0 Tests: 15			X		X		X		X		X		X		X		X		X		X		X		X		X	
Phenols by HPLC (S)	All	NDPs: 0 Tests: 4				X				X						X				X										
Sample description	All	NDPs: 0 Tests: 18	X	X		X		X		X		X		X		X		X		X		X		X		X		X		
Semi Volatile Organic Compounds	All	NDPs: 0 Tests: 7	X			X			X			X				X				X						X				
Total Organic Carbon	All	NDPs: 0 Tests: 15		X		X		X		X		X		X		X		X		X		X		X		X		X	
TPH CWG GC (S)	All	NDPs: 0 Tests: 6				X			X			X				X				X						X				
VOC MS (S)	All	NDPs: 0 Tests: 7		X				X		X			X				X				X									X

Validated

ALcontrol Laboratories Analytical Services

SDG:	100927-62	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100308

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Grain size	Inclusions	Inclusions 2
2154247	BH1	2.00 - 3.00	Red	Sand	0.1 - 2 mm	Stones	None
2154248	BH1		Dark Brown	Loamy Sand	0.1 - 2 mm	Vegetation	None
2154254	BH2	0.65	Dark Brown	Sandy Loam	0.1 - 2 mm	Stones	None
2154256	BH2		Dark Brown	Sandy Clay	0.1 - 2 mm	Stones	Vegetation
2154257	BH2	2.00 - 2.30	Dark Brown	Sandy Clay	0.1 - 2 mm	Stones	None
2154260	BH3	0.60	Dark Brown	Sandy Loam	0.1 - 2 mm	Stones	Vegetation
2154263	BH3	1.00 - 1.35	Light Brown	Sandy Clay	0.1 - 2 mm	Stones	None
2154265	HP1	0.70	Dark Brown	Sand	0.1 - 2 mm	Stones	Vegetation
2154269	WS7	0.30	Dark Brown	Sandy Clay Loam	0.1 - 2 mm	Stones	None
2154273	WS7		Dark Brown	Sand	0.1 - 2 mm	Stones	Vegetation
2154278	WS8	0.30	Dark Brown	Sand	0.1 - 2 mm	Stones	N/A
2154281	WS9	0.30	Dark Brown	Sandy Clay	0.1 - 2 mm	Stones	Vegetation
2154282	WS9	0.65	Light Brown	Silty Clay	0.063 - 0.1 mm	Stones	None
2154290	WS10	0.65	Light Brown	Sandy Loam	0.1 - 2 mm	Stones	None
2154296	WS11	0.65	Dark Brown	Sandy Loam	0.1 - 2 mm	Stones	None
2154297	WS11	2.50 - 3.00	Dark Brown	Sand	0.1 - 2 mm	Stones	Brick
2154298	WS11	0.30	Dark Brown	Sandy Clay	0.1 - 2 mm	Stones	Vegetation
2154300	WS11		Dark Brown	Sandy Clay	0.1 - 2 mm	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Validated

ALcontrol Laboratories Analytical Services

SDG:	100927-62	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100308

Test Completion Dates

Lab Sample No(s)	2154247	2154248	2154254	2154256	2154257	2154260	2154263	2154265	2154269	2154273
Customer Sample Ref.	BH1	BH1	BH2	BH2	BH2	BH3	BH3	HP1	WS7	WS7
AGS Ref.										
Depth	2.00 - 3.00		0.65		2.00 - 2.30	0.60	1.00 - 1.35	0.70	0.30	
Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Asbestos Containing Material Screen			11/10/2010			11/10/2010				
Boron Water Soluble		12/10/2010	12/10/2010	13/10/2010		12/10/2010	12/10/2010	12/10/2010	12/10/2010	12/10/2010
Cyanide Comp/Free/Total/Thiocyanate			12/10/2010			12/10/2010				
EPH CWG (Aliphatic) GC (S)			13/10/2010		13/10/2010		13/10/2010			
EPH CWG (Aromatic) GC (S)			13/10/2010		13/10/2010		13/10/2010			
GRO by GC-FID (S)			12/10/2010		15/10/2010		12/10/2010			
Hexavalent Chromium (s)		11/10/2010	13/10/2010	11/10/2010		11/10/2010	11/10/2010	11/10/2010	11/10/2010	11/10/2010
Metals by iCap-OES (Soil)		12/10/2010	14/10/2010	14/10/2010		14/10/2010	13/10/2010	12/10/2010	12/10/2010	12/10/2010
pH		12/10/2010	13/10/2010	12/10/2010		13/10/2010	13/10/2010	13/10/2010	13/10/2010	13/10/2010
Phenols by HPLC (S)			12/10/2010			12/10/2010				
Sample description	08/10/2010	08/10/2010	11/10/2010	08/10/2010	08/10/2010	11/10/2010	08/10/2010	08/10/2010	08/10/2010	08/10/2010
Semi Volatile Organic Compounds	13/10/2010		13/10/2010		13/10/2010		13/10/2010			
Total Organic Carbon		12/10/2010	12/10/2010	12/10/2010		12/10/2010	12/10/2010	12/10/2010	12/10/2010	12/10/2010
TPH CWG GC (S)			13/10/2010		15/10/2010		13/10/2010			
VOC MS (S)	14/10/2010		18/10/2010		14/10/2010		14/10/2010			

Lab Sample No(s)	2154278	2154281	2154282	2154290	2154296	2154297	2154298	2154300
Customer Sample Ref.	WS8	WS9	WS9	WS10	WS11	WS11	WS11	WS11
AGS Ref.								
Depth	0.30	0.30	0.65	0.65	0.65	2.50 - 3.00	0.30	
Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Asbestos Containing Material Screen		11/10/2010			11/10/2010	11/10/2010		
Boron Water Soluble	12/10/2010	12/10/2010	12/10/2010	12/10/2010	12/10/2010		12/10/2010	12/10/2010
Cyanide Comp/Free/Total/Thiocyanate		12/10/2010			12/10/2010			
EPH CWG (Aliphatic) GC (S)		13/10/2010				13/10/2010		13/10/2010
EPH CWG (Aromatic) GC (S)		13/10/2010				13/10/2010		13/10/2010
GRO by GC-FID (S)		12/10/2010				12/10/2010		12/10/2010
Hexavalent Chromium (s)	11/10/2010	11/10/2010	11/10/2010	11/10/2010	13/10/2010		11/10/2010	11/10/2010
Metals by iCap-OES (Soil)	12/10/2010	12/10/2010	12/10/2010	12/10/2010	14/10/2010		12/10/2010	12/10/2010
pH	12/10/2010	13/10/2010	13/10/2010	12/10/2010	13/10/2010		13/10/2010	13/10/2010
Phenols by HPLC (S)		12/10/2010			12/10/2010			
Sample description	08/10/2010	11/10/2010	08/10/2010	08/10/2010	11/10/2010	08/10/2010	08/10/2010	08/10/2010
Semi Volatile Organic Compounds		13/10/2010				13/10/2010		13/10/2010
Total Organic Carbon	12/10/2010	12/10/2010	12/10/2010	12/10/2010	12/10/2010		12/10/2010	12/10/2010
TPH CWG GC (S)		13/10/2010				13/10/2010		13/10/2010
VOC MS (S)		14/10/2010				14/10/2010		14/10/2010

Validated

ALcontrol Laboratories Analytical Services

SDG:	100927-62	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100308

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	Depth (m)	Sample Type	Date Sampled	Date Received	SDG Ref	Lab Sample No.(s)	AGS Reference
			BH1		Soil/Solid	22/09/2010	25/09/2010	100927-62	2154248	
			BH2		Soil/Solid	24/09/2010	25/09/2010	100927-62	2154256	
			BH2	0.65	Soil/Solid	24/09/2010	25/09/2010	100927-62	2154254	
			BH3	0.60	Soil/Solid	24/09/2010	25/09/2010	100927-62	2154260	
Asbestos Containing Material Screen	-	TM001					No ACM Detected		No ACM Detected	
Phenols, Total monohydric	<0.025 mg/kg	TM062 (S)					0.422 M		<0.025 M	
Soil Organic Matter (SOM)	<0.35 %	TM132	4.41 #				5.12 #		8.4 #	2.83 #
pH	1 pH Units	TM133	6.83 M				8.38 M		7.44 M	8.43 M
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6 #				<0.6 #		<0.6 #	<0.6 #
Cyanide, Total	<1 mg/kg	TM153							<1 M	<1 M
Thiocyanate	<1 mg/kg	TM153							<1 M	<1 M
Antimony	<0.6 mg/kg	TM181							<6 #	1.69 #
Arsenic	<0.6 mg/kg	TM181	8.1 M				10.2 M		13.1 M	7.03 M
Barium	<0.6 mg/kg	TM181	103 #				152 #		145 #	91.8 #
Beryllium	<0.01 mg/kg	TM181	0.717				1.3 M		2.3	0.962
Cadmium	<0.02 mg/kg	TM181	0.578 M				0.848 M		2.92 M	0.551 M
Chromium	<0.9 mg/kg	TM181	16 M				18 M		10.9 M	26.1 M
Copper	<1.4 mg/kg	TM181	20.2 M				48.7 M		34.5 M	24.5 M
Lead	<0.7 mg/kg	TM181	37 M				52 M		48 M	27.7 M
Mercury	<0.14 mg/kg	TM181	0.203 M				<0.14 M		0.249 M	0.226 M
Nickel	<0.2 mg/kg	TM181	15.7 M				26.5 M		34.5 M	21 M
Selenium	<1 mg/kg	TM181	<1 #				1.15 #		<10 #	1.01 #
Vanadium	<0.2 mg/kg	TM181	22.7 #				23.9 #		30.5 #	37.8 #
Zinc	<1.9 mg/kg	TM181	86.6 M				179 M		424 M	111 M
Boron, water soluble	<1 mg/kg	TM222	<1 M				1.9 M		7.4 M	<1 M

SDG:	100927-62	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100308

Semi Volatile Organic Compounds

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH2
			Depth (m)	2.00 - 3.00	0.65	2.00 - 2.30
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	22/09/2010	24/09/2010	24/09/2010
			Date Received	25/09/2010	25/09/2010	25/09/2010
			SDG Ref	100927-62	100927-62	100927-62
			Lab Sample No.(s)	2154247	2154254	2154257
			AGS Reference			
Phenol	<100 µg/kg	TM157		<100	<100	<100
Pentachlorophenol	<100 µg/kg	TM157		<100	<100	<100
n-Nitroso-n-dipropylamine	<100 µg/kg	TM157		<100	<100	<100
Nitrobenzene	<100 µg/kg	TM157		<100	<100	<100
Isophorone	<100 µg/kg	TM157		<100	<100	<100
Hexachloroethane	<100 µg/kg	TM157		<100	<100	<100
Hexachlorocyclopentadiene	<100 µg/kg	TM157		<100	<100	<100
Hexachlorobutadiene	<100 µg/kg	TM157		<100	<100	<100
Hexachlorobenzene	<100 µg/kg	TM157		<100	<100	<100
n-Dioctyl phthalate	<100 µg/kg	TM157		<100	<100	<100
Dimethyl phthalate	<100 µg/kg	TM157		<100	<100	<100
Diethyl phthalate	<100 µg/kg	TM157		<100	<100	<100
n-Dibutyl phthalate	<100 µg/kg	TM157		<100	<100	<100
Dibenzofuran	<100 µg/kg	TM157		<100	17200	<100
Carbazole	<100 µg/kg	TM157		<100	5640	<100
Butylbenzyl phthalate	<100 µg/kg	TM157		<100	<100	<100
bis(2-Ethylhexyl) phthalate	<100 µg/kg	TM157		<100	778	754
bis(2-Chloroethoxy)methane	<100 µg/kg	TM157		<100	<100	<100
bis(2-Chloroethyl)ether	<100 µg/kg	TM157		<100	<100	<100
Azobenzene	<100 µg/kg	TM157		<100	<100	<100
4-Nitrophenol	<100 µg/kg	TM157		<100	<100	<100
4-Nitroaniline	<100 µg/kg	TM157		<100	<100	<100
4-Methylphenol	<100 µg/kg	TM157		<100	<100	<100
4-Chlorophenylphenylether	<100 µg/kg	TM157		<100	<100	<100
4-Chloroaniline	<100 µg/kg	TM157		<100	<100	<100
4-Chloro-3-methylphenol	<100 µg/kg	TM157		<100	<100	<100
4-Bromophenylphenylether	<100 µg/kg	TM157		<100	<100	<100
3-Nitroaniline	<100 µg/kg	TM157		<100	<100	<100
2-Nitrophenol	<100 µg/kg	TM157		<100	<100	<100
2-Nitroaniline	<100 µg/kg	TM157		<100	<100	<100
2-Methylphenol	<100 µg/kg	TM157		<100	<100	<100
1,2,4-Trichlorobenzene	<100 µg/kg	TM157		<100	<100	<100
2-Chlorophenol	<100 µg/kg	TM157		<100	<100	<100
2,6-Dinitrotoluene	<100 µg/kg	TM157		<100	<100	<100
2,4-Dinitrotoluene	<100 µg/kg	TM157		<100	367	<100
2,4-Dimethylphenol	<100 µg/kg	TM157		<100	<100	<100
2,4-Dichlorophenol	<100 µg/kg	TM157		<100	<100	<100
2,4,6-Trichlorophenol	<100 µg/kg	TM157		<100	<100	<100
2,4,5-Trichlorophenol	<100 µg/kg	TM157		<100	<100	<100

ALcontrol Laboratories Analytical Services

SDG:	100927-62	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100308

Semi Volatile Organic Compounds

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH2
			Depth (m)	2.00 - 3.00	0.65	2.00 - 2.30
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	22/09/2010	24/09/2010	24/09/2010
			Date Received	25/09/2010	25/09/2010	25/09/2010
			SDG Ref	100927-62	100927-62	100927-62
			Lab Sample No.(s)	2154247	2154254	2154257
			AGS Reference			
1,4-Dichlorobenzene	<100 µg/kg	TM157		<100	<100	<100
1,3-Dichlorobenzene	<100 µg/kg	TM157		<100	<100	<100
1,2-Dichlorobenzene	<100 µg/kg	TM157		<100	<100	<100
2-Chloronaphthalene	<100 µg/kg	TM157		<100	<100	<100
2-Methylnaphthalene	<100 µg/kg	TM157		<100	5410	247
Acenaphthylene	<100 µg/kg	TM157		<100	229	<100
Acenaphthene	<100 µg/kg	TM157		<100	32500	<100
Anthracene	<100 µg/kg	TM157		<100	9860	<100
Benzo(a)anthracene	<100 µg/kg	TM157		<100	3330	<100
Benzo(b)fluoranthene	<100 µg/kg	TM157		<100	1530	<100
Benzo(k)fluoranthene	<100 µg/kg	TM157		<100	1410	<100
Benzo(a)pyrene	<100 µg/kg	TM157		<100	1550	<100
Benzo(g,h,i)perylene	<100 µg/kg	TM157		<100	603	<100
Chrysene	<100 µg/kg	TM157		<100	3530	152
Fluoranthene	<100 µg/kg	TM157		<100	20500	261
Fluorene	<100 µg/kg	TM157		<100	15700	<100
Indeno(1,2,3-cd)pyrene	<100 µg/kg	TM157		<100	537	<100
Phenanthrene	<100 µg/kg	TM157		<100	41800	383
Pyrene	<100 µg/kg	TM157		<100	15400	237
Naphthalene	<100 µg/kg	TM157		<100	8640	123
Dibenzo(a,h)anthracene	<100 µg/kg	TM157		<100	137	<100

SDG:	100927-62	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100308

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	BH2	BH2
			Depth (m)	0.65	2.00 - 2.30
			Sample Type	Soil/Solid	Soil/Solid
			Date Sampled	24/09/2010	24/09/2010
			Date Received	25/09/2010	25/09/2010
			SDG Ref	100927-62	100927-62
			Lab Sample No.(s)	2154254	2154257
			AGS Reference		
Aliphatics >C12-C16	<100 µg/kg	TM173		59300	20200
Aliphatics >C16-C21	<100 µg/kg	TM173		141000	15300
Aliphatics >C21-C35	<100 µg/kg	TM173		142000	37500
Aliphatics >C35-C44	<100 µg/kg	TM173		16700	6260
Aromatics >EC12-EC16	<100 µg/kg	TM173		203000	20000
Aromatics >EC16-EC21	<100 µg/kg	TM173		374000	43400
Aromatics >EC21-EC35	<100 µg/kg	TM173		291000	124000
Aromatics >EC35-EC44	<100 µg/kg	TM173		45500	38100
Aromatics >EC40-EC44	<100 µg/kg	TM173		15000	12700
Total Aliphatics >C12-C44	<100 µg/kg	TM173		358000	79200
Total Aromatics >EC12-EC44	<100 µg/kg	TM173		913000	225000
Total Aliphatics >C5-35	<100 µg/kg	TM173		344000	72900
Total Aliphatics >C5-C44	<100 µg/kg	TM173		361000	79200
Total Aromatics >C5-35	<100 µg/kg	TM173		869000	187000
Total Aromatics >C6-C44	<100 µg/kg	TM173		914000	225000
Total Aliphatics & Aromatics >C5-35	<100 µg/kg	TM173		1210000	260000
Total Aliphatics & Aromatics >C5-C44	<100 µg/kg	TM173		1280000	304000
GRO Surrogate % recovery**	%	TM089		16	15
GRO >C5-C12	<44 µg/kg	TM089		4080	<44
Methyl tertiary butyl ether (MTBE)	<5 µg/kg	TM089		<5 #	<5 #
Benzene	<10 µg/kg	TM089		<10 M	<10 M
Toluene	<2 µg/kg	TM089		74.1 M	<2 M
Ethylbenzene	<3 µg/kg	TM089		4.56 M	<3 M
m,p-Xylene	<6 µg/kg	TM089		<6 M	<6 M
o-Xylene	<3 µg/kg	TM089		<3 M	<3 M
Aliphatics >C5-C6	<10 µg/kg	TM089		12.5	<10
Aliphatics >C6-C8	<10 µg/kg	TM089		45.6	<10
Aliphatics >C8-C10	<10 µg/kg	TM089		1070	<10
Aliphatics >C10-C12	<10 µg/kg	TM089		1300	<10
Total Aliphatics >C5-C12	<10 µg/kg	TM089		2420	<10
Aromatics >EC5-EC7	<10 µg/kg	TM089		<10	<10
Aromatics >EC7-EC8	<10 µg/kg	TM089		74.1	<10
Aromatics >EC8-EC10	<10 µg/kg	TM089		718	<10
Aromatics >EC10-EC12	<10 µg/kg	TM089		864	<10
Total Aromatics >EC5-EC12	<10 µg/kg	TM089		1660	<10
m,p,o-Xylene	<10 µg/kg	TM089		<10	<10
BTEX, Total	<10 µg/kg	TM089		78.7	<10

SDG:	100927-62	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100308

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH2
			Depth (m)	2.00 - 3.00	0.65	2.00 - 2.30
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	22/09/2010	24/09/2010	24/09/2010
			Date Received	25/09/2010	25/09/2010	25/09/2010
			SDG Ref	100927-62	100927-62	100927-62
			Lab Sample No.(s)	2154247	2154254	2154257
			AGS Reference			
Dibromofluoromethane**	%	TM116		108	74.9	113
Toluene-d8**	%	TM116		101	77.6	94.9
4-Bromofluorobenzene**	%	TM116		101	155	133
Dichlorodifluoromethane	<4 µg/kg	TM116		<4 M	<4 M	<4 M
Chloromethane	<7 µg/kg	TM116		<7 #	<7 #	<7 #
Vinyl Chloride	<10 µg/kg	TM116		<10 #	<10 #	<10 #
Bromomethane	<13 µg/kg	TM116		<13 M	<13 M	<13 M
Chloroethane	<14 µg/kg	TM116		<14 M	<14 M	<14 M
Trichlorofluorormethane	<6 µg/kg	TM116		<6 M	<6 M	<6 M
1.1-Dichloroethene	<10 µg/kg	TM116		<10 #	<10 #	<10 #
Carbon Disulphide	<7 µg/kg	TM116		<7 M	72 M	<7 M
Dichloromethane	<10 µg/kg	TM116		<10 #	58.5 #	<10 #
Methyl Tertiary Butyl Ether	<11 µg/kg	TM116		<11 M	<11 M	<11 M
trans-1-2-Dichloroethene	<11 µg/kg	TM116		<11 M	<11 M	<11 M
1.1-Dichloroethane	<8 µg/kg	TM116		<8 M	<8 M	<8 M
cis-1-2-Dichloroethene	<5 µg/kg	TM116		<5 M	<5 M	<5 M
2.2-Dichloropropane	<12 µg/kg	TM116		<12 M	<12 M	<12 M
Bromochloromethane	<14 µg/kg	TM116		<14 M	<14 M	<14 M
Chloroform	<8 µg/kg	TM116		<8 M	<8 M	<8 M
1.1.1-Trichloroethane	<7 µg/kg	TM116		<7 M	<7 M	<7 M
1.1-Dichloropropene	<11 µg/kg	TM116		<11 M	<11 M	<11 M
Carbontetrachloride	<14 µg/kg	TM116		<14 M	<14 M	<14 M
1.2-Dichloroethane	<5 µg/kg	TM116		<5 M	<5 M	<5 M
Benzene	<9 µg/kg	TM116		<9 M	22.8 M	<9 M
Trichloroethene	<9 µg/kg	TM116		<9 M	<9 M	<9 M
1.2-Dichloropropane	<12 µg/kg	TM116		<12 M	<12 M	<12 M
Dibromomethane	<9 µg/kg	TM116		<9 M	<9 M	<9 M
Bromodichloromethane	<7 µg/kg	TM116		<7 M	<7 M	<7 M
cis-1-3-Dichloropropene	<14 µg/kg	TM116		<14 M	<14 M	<14 M
Toluene	<5 µg/kg	TM116		<5 M	693 M	7.53 M
trans-1-3-Dichloropropene	<14 µg/kg	TM116		<14	<14	<14
1.1.2-Trichloroethane	<10 µg/kg	TM116		<10 M	<10 M	<10 M
1.3-Dichloropropane	<7 µg/kg	TM116		<7 #	<7 #	<7 #
Tetrachloroethene	<5 µg/kg	TM116		<5 M	26.1 M	<5 M
Dibromochloromethane	<13 µg/kg	TM116		<13 M	<13 M	<13 M
1.2-Dibromoethane	<12 µg/kg	TM116		<12 M	<12 M	<12 M
Chorobenzene	<5 µg/kg	TM116		<5 M	<5 M	<5 M
1.1.1.2-Tetrachloroethane	<10 µg/kg	TM116		<10 M	<10 M	<10 M
Ethylbenzene	<4 µg/kg	TM116		<4 M	52.6 M	13.6 M

SDG:	100927-62	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100308

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Customer Sample Ref.	BH1	BH2	BH2
Depth (m)	2.00 - 3.00	0.65	2.00 - 2.30
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	22/09/2010	24/09/2010	24/09/2010
Date Received	25/09/2010	25/09/2010	25/09/2010
SDG Ref	100927-62	100927-62	100927-62
Lab Sample No.(s)	2154247	2154254	2154257
AGS Reference			

Component	LOD/Units	Method			
p/m-Xylene	<14 µg/kg	TM116	<14 #	67.4 #	<14 #
o-Xylene	<10 µg/kg	TM116	<10 M	65.3 M	<10 M
Styrene	<10 µg/kg	TM116	<10 M	<10 M	<10 M
Bromoform	<10 µg/kg	TM116	<10 M	<10 M	<10 M
Isopropylbenzene	<5 µg/kg	TM116	<5 M	195 M	<5 M
1.1.2.2-Tetrachloroethane	<10 µg/kg	TM116	<10 #	<10 #	<10 #
1.2.3-Trichloropropane	<17 µg/kg	TM116	<17 M	<17 M	<17 M
Bromobenzene	<10 µg/kg	TM116	<10 M	<10 M	<10 M
Propylbenzene	<11 µg/kg	TM116	<11 M	<11 M	<11 M
2-Chlorotoluene	<9 µg/kg	TM116	<9 M	<9 M	<9 M
1.3.5-Trimethylbenzene	<8 µg/kg	TM116	<8 #	<8 #	<8 #
4-Chlorotoluene	<12 µg/kg	TM116	<12 M	<12 M	<12 M
tert-Butylbenzene	<12 µg/kg	TM116	<12 #	<12 #	<12 #
1.2.4-Trimethylbenzene	<9 µg/kg	TM116	<9 #	<9 #	<9 #
sec-Butylbenzene	<10 µg/kg	TM116	<10 M	<10 M	<10 M
4-Isopropyltoluene	<11 µg/kg	TM116	<11 M	1070 M	<11 M
1.3-Dichlorobenzene	<6 µg/kg	TM116	<6 M	<6 M	<6 M
1.4-Dichlorobenzene	<5 µg/kg	TM116	<5 M	<5 M	<5 M
n-Butylbenzene	<10 µg/kg	TM116	<10 M	<10 M	<10 M
1.2-Dichlorobenzene	<12 µg/kg	TM116	<12 M	<12 M	<12 M
1.2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M	<14 M	<14 M
Tert-amyl methyl ether	<15 µg/kg	TM116	<15	<15	<15
1.2.4-Trichlorobenzene	<6 µg/kg	TM116	<6 #	<6 #	<6 #
Hexachlorobutadiene	<12 µg/kg	TM116	<12	<12	<12
Naphthalene	<13 µg/kg	TM116	<13 M	4760 M	<13 M
1.2.3-Trichlorobenzene	<6 µg/kg	TM116	<6 M	<6 M	<6 M

Validated

ALcontrol Laboratories Analytical Services

SDG:	100927-62	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100308

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	BH3	HP1	WS10	WS11	WS11	WS11
			Depth (m)	1.00 - 1.35	0.70	0.65		0.30	0.65
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	24/09/2010	22/09/2010	23/09/2010	23/09/2010	23/09/2010	23/09/2010
			Date Received	25/09/2010	25/09/2010	25/09/2010	25/09/2010	25/09/2010	25/09/2010
			SDG Ref	100927-62	100927-62	100927-62	100927-62	100927-62	100927-62
			Lab Sample No.(s)	2154263	2154265	2154290	2154300	2154298	2154296
			AGS Reference						
Asbestos Containing Material Screen	-	TM001							No ACM Detected
Phenols, Total monohydric	<0.025 mg/kg	TM062 (S)							<0.025 M
Soil Organic Matter (SOM)	<0.35 %	TM132		6.57 #	7.5 #	0.465 #	5.53 #	7.91 #	7.02 #
pH	1 pH Units	TM133		8.29 M	5.78 M	8.63 M	7.01 M	7.32 M	7.84 M
Chromium, Hexavalent	<0.6 mg/kg	TM151		<0.6 #	<0.6 #	<0.6 #	<0.6 #	<1.2 #	<1.2 #
Cyanide, Total	<1 mg/kg	TM153							<1 M
Thiocyanate	<1 mg/kg	TM153							<1 M
Arsenic	<0.6 mg/kg	TM181		9.97 M	7.32 M	4.69 M	10.7 M	9.52 M	14.2 M
Barium	<0.6 mg/kg	TM181		113 #	65.6 #	41.9 #	145 #	152 #	185 #
Beryllium	<0.01 mg/kg	TM181		1.43	0.697	0.322	1.51	1.87	1.84
Cadmium	<0.02 mg/kg	TM181		0.829 M	0.662 M	0.2 M	0.932 M	1.36 M	1.29 M
Chromium	<0.9 mg/kg	TM181		17 M	14.1 M	9.72 M	20 M	18.4 M	17.6 M
Copper	<1.4 mg/kg	TM181		39.8 M	27.6 M	11.2 M	42.8 M	45.9 M	41.2 M
Lead	<0.7 mg/kg	TM181		35.2 M	70.8 M	15.3 M	42.9 M	84.8 M	83 M
Mercury	<0.14 mg/kg	TM181		0.328 M	0.268 M	0.382 M	0.161 M	0.206 M	<0.14 M
Nickel	<0.2 mg/kg	TM181		36.5 M	15.9 M	8.32 M	35.7 M	45.5 M	34.3 M
Selenium	<1 mg/kg	TM181		<1 #	1.19 #	<1 #	1.13 #	1.66 #	1.42 #
Vanadium	<0.2 mg/kg	TM181		22.3 #	20.2 #	11.5 #	27.2 #	28.7 #	28.7 #
Zinc	<1.9 mg/kg	TM181		187 M	117 M	31.2 M	222 M	336 M	307 M
Boron, water soluble	<1 mg/kg	TM222		5.58 M	3.11 M	<1 M	<1 M	1.59 M	3.95 M

SDG:	100927-62	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100308

Semi Volatile Organic Compounds

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	BH3	WS11
			Depth (m)	1.00 - 1.35	
			Sample Type	Soil/Solid	Soil/Solid
			Date Sampled	24/09/2010	23/09/2010
			Date Received	25/09/2010	25/09/2010
			SDG Ref	100927-62	100927-62
			Lab Sample No.(s)	2154263	2154300
			AGS Reference		
Phenol	<100 µg/kg	TM157		<100	<100
Pentachlorophenol	<100 µg/kg	TM157		<100	<100
n-Nitroso-n-dipropylamine	<100 µg/kg	TM157		<100	<100
Nitrobenzene	<100 µg/kg	TM157		<100	<100
Isophorone	<100 µg/kg	TM157		<100	<100
Hexachloroethane	<100 µg/kg	TM157		<100	<100
Hexachlorocyclopentadiene	<100 µg/kg	TM157		<100	<100
Hexachlorobutadiene	<100 µg/kg	TM157		<100	<100
Hexachlorobenzene	<100 µg/kg	TM157		<100	<100
n-Dioctyl phthalate	<100 µg/kg	TM157		<100	<100
Dimethyl phthalate	<100 µg/kg	TM157		<100	<100
Diethyl phthalate	<100 µg/kg	TM157		<100	<100
n-Dibutyl phthalate	<100 µg/kg	TM157		<100	<100
Dibenzofuran	<100 µg/kg	TM157		144	<100
Carbazole	<100 µg/kg	TM157		<100	<100
Butylbenzyl phthalate	<100 µg/kg	TM157		<100	<100
bis(2-Ethylhexyl) phthalate	<100 µg/kg	TM157		<100	<100
bis(2-Chloroethoxy)methane	<100 µg/kg	TM157		<100	<100
bis(2-Chloroethyl)ether	<100 µg/kg	TM157		<100	<100
Azobenzene	<100 µg/kg	TM157		<100	<100
4-Nitrophenol	<100 µg/kg	TM157		<100	<100
4-Nitroaniline	<100 µg/kg	TM157		<100	<100
4-Methylphenol	<100 µg/kg	TM157		<100	<100
4-Chlorophenylphenylether	<100 µg/kg	TM157		<100	<100
4-Chloroaniline	<100 µg/kg	TM157		<100	<100
4-Chloro-3-methylphenol	<100 µg/kg	TM157		<100	<100
4-Bromophenylphenylether	<100 µg/kg	TM157		<100	<100
3-Nitroaniline	<100 µg/kg	TM157		<100	<100
2-Nitrophenol	<100 µg/kg	TM157		<100	<100
2-Nitroaniline	<100 µg/kg	TM157		<100	<100
2-Methylphenol	<100 µg/kg	TM157		<100	<100
1,2,4-Trichlorobenzene	<100 µg/kg	TM157		<100	<100
2-Chlorophenol	<100 µg/kg	TM157		<100	<100
2,6-Dinitrotoluene	<100 µg/kg	TM157		<100	<100
2,4-Dinitrotoluene	<100 µg/kg	TM157		<100	<100
2,4-Dimethylphenol	<100 µg/kg	TM157		<100	<100
2,4-Dichlorophenol	<100 µg/kg	TM157		<100	<100
2,4,6-Trichlorophenol	<100 µg/kg	TM157		<100	<100
2,4,5-Trichlorophenol	<100 µg/kg	TM157		<100	<100

SDG:	100927-62	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100308

Semi Volatile Organic Compounds

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	BH3	WS11
			Depth (m)	1.00 - 1.35	
			Sample Type	Soil/Solid	Soil/Solid
			Date Sampled	24/09/2010	23/09/2010
			Date Received	25/09/2010	25/09/2010
			SDG Ref	100927-62	100927-62
			Lab Sample No.(s)	2154263	2154300
			AGS Reference		
1,4-Dichlorobenzene	<100 µg/kg	TM157		<100	<100
1,3-Dichlorobenzene	<100 µg/kg	TM157		<100	<100
1,2-Dichlorobenzene	<100 µg/kg	TM157		<100	<100
2-Chloronaphthalene	<100 µg/kg	TM157		<100	<100
2-Methylnaphthalene	<100 µg/kg	TM157		316	201
Acenaphthylene	<100 µg/kg	TM157		<100	<100
Acenaphthene	<100 µg/kg	TM157		<100	<100
Anthracene	<100 µg/kg	TM157		<100	<100
Benzo(a)anthracene	<100 µg/kg	TM157		<100	<100
Benzo(b)fluoranthene	<100 µg/kg	TM157		<100	<100
Benzo(k)fluoranthene	<100 µg/kg	TM157		<100	<100
Benzo(a)pyrene	<100 µg/kg	TM157		<100	<100
Benzo(g,h,i)perylene	<100 µg/kg	TM157		<100	<100
Chrysene	<100 µg/kg	TM157		<100	<100
Fluoranthene	<100 µg/kg	TM157		151	125
Fluorene	<100 µg/kg	TM157		<100	<100
Indeno(1,2,3-cd)pyrene	<100 µg/kg	TM157		<100	<100
Phenanthrene	<100 µg/kg	TM157		397	279
Pyrene	<100 µg/kg	TM157		134	<100
Naphthalene	<100 µg/kg	TM157		149	<100
Dibenzo(a,h)anthracene	<100 µg/kg	TM157		<100	<100

SDG:	100927-62	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100308

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	BH3	WS11
			Depth (m)	1.00 - 1.35	
			Sample Type	Soil/Solid	Soil/Solid
			Date Sampled	24/09/2010	23/09/2010
			Date Received	25/09/2010	25/09/2010
			SDG Ref	100927-62	100927-62
			Lab Sample No.(s)	2154263	2154300
			AGS Reference		
Aliphatics >C12-C16	<100 µg/kg	TM173		22500	23100
Aliphatics >C16-C21	<100 µg/kg	TM173		58600	17800
Aliphatics >C21-C35	<100 µg/kg	TM173		34600	44500
Aliphatics >C35-C44	<100 µg/kg	TM173		5110	10800
Aromatics >EC12-EC16	<100 µg/kg	TM173		26400	24700
Aromatics >EC16-EC21	<100 µg/kg	TM173		53500	34900
Aromatics >EC21-EC35	<100 µg/kg	TM173		103000	87000
Aromatics >EC35-EC44	<100 µg/kg	TM173		34200	33300
Aromatics >EC40-EC44	<100 µg/kg	TM173		12300	13500
Total Aliphatics >C12-C44	<100 µg/kg	TM173		121000	96200
Total Aromatics >EC12-EC44	<100 µg/kg	TM173		217000	180000
Total Aliphatics >C5-35	<100 µg/kg	TM173		116000	85300
Total Aliphatics >C5-C44	<100 µg/kg	TM173		121000	96200
Total Aromatics >C5-35	<100 µg/kg	TM173		183000	147000
Total Aromatics >C6-C44	<100 µg/kg	TM173		217000	180000
Total Aliphatics & Aromatics >C5-35	<100 µg/kg	TM173		299000	232000
Total Aliphatics & Aromatics >C5-C44	<100 µg/kg	TM173		338000	276000
GRO Surrogate % recovery**	%	TM089		32	27
GRO >C5-C12	<44 µg/kg	TM089		117	<44
Methyl tertiary butyl ether (MTBE)	<5 µg/kg	TM089		<5 #	<5 #
Benzene	<10 µg/kg	TM089		<10 M	<10 M
Toluene	<2 µg/kg	TM089		3.54 M	2.42 M
Ethylbenzene	<3 µg/kg	TM089		5.9 M	4.84 M
m,p-Xylene	<6 µg/kg	TM089		<6 M	<6 M
o-Xylene	<3 µg/kg	TM089		<3 M	<3 M
Aliphatics >C5-C6	<10 µg/kg	TM089		<10	<10
Aliphatics >C6-C8	<10 µg/kg	TM089		14.2	<10
Aliphatics >C8-C10	<10 µg/kg	TM089		20.1	<10
Aliphatics >C10-C12	<10 µg/kg	TM089		30.7	<10
Total Aliphatics >C5-C12	<10 µg/kg	TM089		68.4	<10
Aromatics >EC5-EC7	<10 µg/kg	TM089		<10	<10
Aromatics >EC7-EC8	<10 µg/kg	TM089		<10	<10
Aromatics >EC8-EC10	<10 µg/kg	TM089		22.4	<10
Aromatics >EC10-EC12	<10 µg/kg	TM089		20.1	<10
Total Aromatics >EC5-EC12	<10 µg/kg	TM089		48.4	<10
m,p,o-Xylene	<10 µg/kg	TM089		<10	<10
BTEX, Total	<10 µg/kg	TM089		<10	<10

SDG:	100927-62	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100308

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	BH3	WS11
			Depth (m)	1.00 - 1.35	
			Sample Type	Soil/Solid	Soil/Solid
			Date Sampled	24/09/2010	23/09/2010
			Date Received	25/09/2010	25/09/2010
			SDG Ref	100927-62	100927-62
			Lab Sample No.(s)	2154263	2154300
			AGS Reference		
Dibromofluoromethane**	%	TM116		88.6	96.5
Toluene-d8**	%	TM116		93.4	86.5
4-Bromofluorobenzene**	%	TM116		145	149
Dichlorodifluoromethane	<4 µg/kg	TM116		<4 M	<4 M
Chloromethane	<7 µg/kg	TM116		<7 #	<7 #
Vinyl Chloride	<10 µg/kg	TM116		<10 #	<10 #
Bromomethane	<13 µg/kg	TM116		<13 M	<13 M
Chloroethane	<14 µg/kg	TM116		<14 M	<14 M
Trichlorofluorormethane	<6 µg/kg	TM116		<6 M	<6 M
1.1-Dichloroethene	<10 µg/kg	TM116		<10 #	<10 #
Carbon Disulphide	<7 µg/kg	TM116		42 M	<7 M
Dichloromethane	<10 µg/kg	TM116		27.5 #	19.9 #
Methyl Tertiary Butyl Ether	<11 µg/kg	TM116		<11 M	<11 M
trans-1-2-Dichloroethene	<11 µg/kg	TM116		<11 M	<11 M
1.1-Dichloroethane	<8 µg/kg	TM116		<8 M	<8 M
cis-1-2-Dichloroethene	<5 µg/kg	TM116		<5 M	<5 M
2.2-Dichloropropane	<12 µg/kg	TM116		<12 M	<12 M
Bromochloromethane	<14 µg/kg	TM116		<14 M	<14 M
Chloroform	<8 µg/kg	TM116		<8 M	<8 M
1.1.1-Trichloroethane	<7 µg/kg	TM116		<7 M	<7 M
1.1-Dichloropropene	<11 µg/kg	TM116		<11 M	<11 M
Carbontetrachloride	<14 µg/kg	TM116		<14 M	<14 M
1.2-Dichloroethane	<5 µg/kg	TM116		<5 M	<5 M
Benzene	<9 µg/kg	TM116		15.2 M	12.4 M
Trichloroethene	<9 µg/kg	TM116		<9 M	<9 M
1.2-Dichloropropane	<12 µg/kg	TM116		<12 M	<12 M
Dibromomethane	<9 µg/kg	TM116		<9 M	<9 M
Bromodichloromethane	<7 µg/kg	TM116		<7 M	<7 M
cis-1-3-Dichloropropene	<14 µg/kg	TM116		<14 M	<14 M
Toluene	<5 µg/kg	TM116		16.5 M	11.4 M
trans-1-3-Dichloropropene	<14 µg/kg	TM116		<14	<14
1.1.2-Trichloroethane	<10 µg/kg	TM116		<10 M	<10 M
1.3-Dichloropropane	<7 µg/kg	TM116		<7 #	<7 #
Tetrachloroethene	<5 µg/kg	TM116		18.8 M	25 M
Dibromochloromethane	<13 µg/kg	TM116		<13 M	<13 M
1.2-Dibromoethane	<12 µg/kg	TM116		<12 M	<12 M
Chorobenzene	<5 µg/kg	TM116		<5 M	<5 M
1.1.1.2-Tetrachloroethane	<10 µg/kg	TM116		<10 M	<10 M
Ethylbenzene	<4 µg/kg	TM116		30.7 M	32.7 M

SDG:	100927-62	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100308

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	BH3	WS11
			Depth (m)	1.00 - 1.35	
			Sample Type	Soil/Solid	Soil/Solid
			Date Sampled	24/09/2010	23/09/2010
			Date Received	25/09/2010	25/09/2010
			SDG Ref	100927-62	100927-62
			Lab Sample No.(s)	2154263	2154300
			AGS Reference		
p/m-Xylene	<14 µg/kg	TM116		20.2 #	<14 #
o-Xylene	<10 µg/kg	TM116		<10 M	<10 M
Styrene	<10 µg/kg	TM116		<10 M	<10 M
Bromoform	<10 µg/kg	TM116		<10 M	<10 M
Isopropylbenzene	<5 µg/kg	TM116		<5 M	<5 M
1.1.2.2-Tetrachloroethane	<10 µg/kg	TM116		<10 #	<10 #
1.2.3-Trichloropropane	<17 µg/kg	TM116		<17 M	<17 M
Bromobenzene	<10 µg/kg	TM116		<10 M	<10 M
Propylbenzene	<11 µg/kg	TM116		<11 M	<11 M
2-Chlorotoluene	<9 µg/kg	TM116		<9 M	<9 M
1.3.5-Trimethylbenzene	<8 µg/kg	TM116		<8 #	<8 #
4-Chlorotoluene	<12 µg/kg	TM116		<12 M	<12 M
tert-Butylbenzene	<12 µg/kg	TM116		<12 #	<12 #
1.2.4-Trimethylbenzene	<9 µg/kg	TM116		<9 #	<9 #
sec-Butylbenzene	<10 µg/kg	TM116		<10 M	<10 M
4-Isopropyltoluene	<11 µg/kg	TM116		<11 M	<11 M
1.3-Dichlorobenzene	<6 µg/kg	TM116		<6 M	<6 M
1.4-Dichlorobenzene	<5 µg/kg	TM116		<5 M	<5 M
n-Butylbenzene	<10 µg/kg	TM116		<10 M	<10 M
1.2-Dichlorobenzene	<12 µg/kg	TM116		<12 M	<12 M
1.2-Dibromo-3-chloropropane	<14 µg/kg	TM116		<14 M	<14 M
Tert-amyl methyl ether	<15 µg/kg	TM116		<15	<15
1.2.4-Trichlorobenzene	<6 µg/kg	TM116		<6 #	<6 #
Hexachlorobutadiene	<12 µg/kg	TM116		<12	<12
Naphthalene	<13 µg/kg	TM116		<13 M	<13 M
1.2.3-Trichlorobenzene	<6 µg/kg	TM116		<6 M	<6 M

Validated

ALcontrol Laboratories Analytical Services

SDG:	100927-62	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100308

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	Depth (m)	Sample Type	Date Sampled	Date Received	SDG Ref	Lab Sample No.(s)	AGS Reference
			WS11	2.50 - 3.00	Soil/Solid	23/09/2010	25/09/2010	100927-62	2154297	
Asbestos Containing Material Screen	-	TM001	No ACM Detected							
Phenols, Total monohydric	<0.025 mg/kg	TM062 (S)								
Soil Organic Matter (SOM)	<0.35 %	TM132								
pH	1 pH Units	TM133								
Chromium, Hexavalent	<0.6 mg/kg	TM151								
Cyanide, Total	<1 mg/kg	TM153								
Thiocyanate	<1 mg/kg	TM153								
Antimony	<0.6 mg/kg	TM181								
Arsenic	<0.6 mg/kg	TM181								
Barium	<0.6 mg/kg	TM181								
Beryllium	<0.01 mg/kg	TM181								
Cadmium	<0.02 mg/kg	TM181								
Chromium	<0.9 mg/kg	TM181								
Copper	<1.4 mg/kg	TM181								
Lead	<0.7 mg/kg	TM181								
Mercury	<0.14 mg/kg	TM181								
Nickel	<0.2 mg/kg	TM181								
Selenium	<1 mg/kg	TM181								
Vanadium	<0.2 mg/kg	TM181								
Zinc	<1.9 mg/kg	TM181								
Boron, water soluble	<1 mg/kg	TM222								

Component	LOD/Units	Method	WS7	WS7	WS8	WS9	WS9
				0.30	0.30	0.30	0.65
			Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			22/09/2010	22/09/2010	23/09/2010	23/09/2010	23/09/2010
			25/09/2010	25/09/2010	25/09/2010	25/09/2010	25/09/2010
			100927-62	100927-62	100927-62	100927-62	100927-62
			2154273	2154269	2154278	2154281	2154282
Asbestos Containing Material Screen	-	TM001				No ACM Detected	
Phenols, Total monohydric	<0.025 mg/kg	TM062 (S)				<0.025 M	
Soil Organic Matter (SOM)	<0.35 %	TM132	6.45 #	2.95 #	1.45 #	4.57 #	0.465 #
pH	1 pH Units	TM133	7.38 M	7.78 M	7.66 M	8.38 M	7.82 M
Chromium, Hexavalent	<0.6 mg/kg	TM151	<1.2 #	<0.6 #	<0.6 #	<0.6 #	<0.6 #
Cyanide, Total	<1 mg/kg	TM153				<1 M	
Thiocyanate	<1 mg/kg	TM153				<1 M	
Antimony	<0.6 mg/kg	TM181				1.56 #	
Arsenic	<0.6 mg/kg	TM181	8.35 M	7.55 M	6.22 M	8.81 M	6.41 M
Barium	<0.6 mg/kg	TM181	158 #	105 #	76.2 #	128 #	87 #
Beryllium	<0.01 mg/kg	TM181	0.845	1.01	0.576	1.22	0.952
Cadmium	<0.02 mg/kg	TM181	0.647 M	0.579 M	0.314 M	0.644 M	0.371 M
Chromium	<0.9 mg/kg	TM181	23.8 M	21.4 M	15.1 M	25.3 M	26.3 M
Copper	<1.4 mg/kg	TM181	42.3 M	28 M	14.7 M	26.2 M	19 M
Lead	<0.7 mg/kg	TM181	52.6 M	20.3 M	17.5 M	27.8 M	10.3 M
Mercury	<0.14 mg/kg	TM181	0.212 M	0.155 M	0.24 M	0.428 M	0.364 M
Nickel	<0.2 mg/kg	TM181	18.6 M	23.8 M	13.8 M	28.6 M	26.1 M
Selenium	<1 mg/kg	TM181	<1 #	<1 #	<1 #	1.06 #	1.2 #
Vanadium	<0.2 mg/kg	TM181	25.7 #	27.3 #	17.9 #	27.5 #	27 #
Zinc	<1.9 mg/kg	TM181	143 M	90.7 M	39.9 M	124 M	48.5 M
Boron, water soluble	<1 mg/kg	TM222	2.16 M	1.23 M	<1 M	1.86 M	1.55 M

SDG:	100927-62	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100308

Semi Volatile Organic Compounds

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	WS11	WS9
			Depth (m)	2.50 - 3.00	0.30
			Sample Type	Soil/Solid	Soil/Solid
			Date Sampled	23/09/2010	23/09/2010
			Date Received	25/09/2010	25/09/2010
			SDG Ref	100927-62	100927-62
			Lab Sample No.(s)	2154297	2154281
			AGS Reference		
Phenol	<100 µg/kg	TM157		<100	<100
Pentachlorophenol	<100 µg/kg	TM157		<100	<100
n-Nitroso-n-dipropylamine	<100 µg/kg	TM157		<100	<100
Nitrobenzene	<100 µg/kg	TM157		<100	<100
Isophorone	<100 µg/kg	TM157		<100	<100
Hexachloroethane	<100 µg/kg	TM157		<100	<100
Hexachlorocyclopentadiene	<100 µg/kg	TM157		<100	<200
Hexachlorobutadiene	<100 µg/kg	TM157		<100	<100
Hexachlorobenzene	<100 µg/kg	TM157		<100	<100
n-Dioctyl phthalate	<100 µg/kg	TM157		<100	<100
Dimethyl phthalate	<100 µg/kg	TM157		<100	<100
Diethyl phthalate	<100 µg/kg	TM157		<100	<100
n-Dibutyl phthalate	<100 µg/kg	TM157		<100	<100
Dibenzofuran	<100 µg/kg	TM157		<100	<100
Carbazole	<100 µg/kg	TM157		<100	<100
Butylbenzyl phthalate	<100 µg/kg	TM157		<100	<100
bis(2-Ethylhexyl) phthalate	<100 µg/kg	TM157		231	<100
bis(2-Chloroethoxy)methane	<100 µg/kg	TM157		<100	<100
bis(2-Chloroethyl)ether	<100 µg/kg	TM157		<100	<100
Azobenzene	<100 µg/kg	TM157		<100	<100
4-Nitrophenol	<100 µg/kg	TM157		<100	<100
4-Nitroaniline	<100 µg/kg	TM157		<100	<100
4-Methylphenol	<100 µg/kg	TM157		<100	<100
4-Chlorophenylphenylether	<100 µg/kg	TM157		<100	<100
4-Chloroaniline	<100 µg/kg	TM157		<100	<100
4-Chloro-3-methylphenol	<100 µg/kg	TM157		<100	<100
4-Bromophenylphenylether	<100 µg/kg	TM157		<100	<100
3-Nitroaniline	<100 µg/kg	TM157		<100	<100
2-Nitrophenol	<100 µg/kg	TM157		<100	<100
2-Nitroaniline	<100 µg/kg	TM157		<100	<100
2-Methylphenol	<100 µg/kg	TM157		<100	<100
1,2,4-Trichlorobenzene	<100 µg/kg	TM157		<100	<100
2-Chlorophenol	<100 µg/kg	TM157		<100	<100
2,6-Dinitrotoluene	<100 µg/kg	TM157		<100	<100
2,4-Dinitrotoluene	<100 µg/kg	TM157		<100	<100
2,4-Dimethylphenol	<100 µg/kg	TM157		<100	<100
2,4-Dichlorophenol	<100 µg/kg	TM157		<100	<100
2,4,6-Trichlorophenol	<100 µg/kg	TM157		<100	<100
2,4,5-Trichlorophenol	<100 µg/kg	TM157		<100	<100

SDG:	100927-62	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100308

Semi Volatile Organic Compounds

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	WS11	WS9
			Depth (m)	2.50 - 3.00	0.30
			Sample Type	Soil/Solid	Soil/Solid
			Date Sampled	23/09/2010	23/09/2010
			Date Received	25/09/2010	25/09/2010
			SDG Ref	100927-62	100927-62
			Lab Sample No.(s)	2154297	2154281
			AGS Reference		
1,4-Dichlorobenzene	<100 µg/kg	TM157		<100	<100
1,3-Dichlorobenzene	<100 µg/kg	TM157		<100	<100
1,2-Dichlorobenzene	<100 µg/kg	TM157		<100	<100
2-Chloronaphthalene	<100 µg/kg	TM157		<100	<100
2-Methylnaphthalene	<100 µg/kg	TM157		150	<100
Acenaphthylene	<100 µg/kg	TM157		<100	<100
Acenaphthene	<100 µg/kg	TM157		<100	<100
Anthracene	<100 µg/kg	TM157		<100	<100
Benzo(a)anthracene	<100 µg/kg	TM157		<100	<100
Benzo(b)fluoranthene	<100 µg/kg	TM157		<100	<100
Benzo(k)fluoranthene	<100 µg/kg	TM157		<100	<100
Benzo(a)pyrene	<100 µg/kg	TM157		<100	<100
Benzo(g,h,i)perylene	<100 µg/kg	TM157		<100	<100
Chrysene	<100 µg/kg	TM157		<100	<100
Fluoranthene	<100 µg/kg	TM157		<100	164
Fluorene	<100 µg/kg	TM157		<100	<100
Indeno(1,2,3-cd)pyrene	<100 µg/kg	TM157		<100	<100
Phenanthrene	<100 µg/kg	TM157		<100	242
Pyrene	<100 µg/kg	TM157		<100	146
Naphthalene	<100 µg/kg	TM157		<100	<100
Dibenzo(a,h)anthracene	<100 µg/kg	TM157		<100	<100

SDG:	100927-62	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100308

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	WS11	WS9
			Depth (m)	2.50 - 3.00	0.30
			Sample Type	Soil/Solid	Soil/Solid
			Date Sampled	23/09/2010	23/09/2010
			Date Received	25/09/2010	25/09/2010
			SDG Ref	100927-62	100927-62
			Lab Sample No.(s)	2154297	2154281
			AGS Reference		
Aliphatics >C12-C16	<100 µg/kg	TM173		6020	7990
Aliphatics >C16-C21	<100 µg/kg	TM173		4940	9510
Aliphatics >C21-C35	<100 µg/kg	TM173		13200	47000
Aliphatics >C35-C44	<100 µg/kg	TM173		1210	9040
Aromatics >EC12-EC16	<100 µg/kg	TM173		8750	7580
Aromatics >EC16-EC21	<100 µg/kg	TM173		9650	17100
Aromatics >EC21-EC35	<100 µg/kg	TM173		19500	53800
Aromatics >EC35-EC44	<100 µg/kg	TM173		3950	18500
Aromatics >EC40-EC44	<100 µg/kg	TM173		951	6610
Total Aliphatics >C12-C44	<100 µg/kg	TM173		25300	73500
Total Aromatics >EC12-EC44	<100 µg/kg	TM173		41800	97000
Total Aliphatics >C5-35	<100 µg/kg	TM173		24500	64500
Total Aliphatics >C5-C44	<100 µg/kg	TM173		25700	73500
Total Aromatics >C5-35	<100 µg/kg	TM173		38200	78500
Total Aromatics >C6-C44	<100 µg/kg	TM173		42100	97000
Total Aliphatics & Aromatics >C5-35	<100 µg/kg	TM173		62700	143000
Total Aliphatics & Aromatics >C5-C44	<100 µg/kg	TM173		67800	171000
GRO Surrogate % recovery**	%	TM089		66	73
GRO >C5-C12	<44 µg/kg	TM089		641	<44
Methyl tertiary butyl ether (MTBE)	<5 µg/kg	TM089		<5 #	<5 #
Benzene	<10 µg/kg	TM089		<10 M	<10 M
Toluene	<2 µg/kg	TM089		4.72 M	<2 M
Ethylbenzene	<3 µg/kg	TM089		15.3 M	<3 M
m,p-Xylene	<6 µg/kg	TM089		<6 M	<6 M
o-Xylene	<3 µg/kg	TM089		3.54 M	<3 M
Aliphatics >C5-C6	<10 µg/kg	TM089		<10	<10
Aliphatics >C6-C8	<10 µg/kg	TM089		16.5	<10
Aliphatics >C8-C10	<10 µg/kg	TM089		198	<10
Aliphatics >C10-C12	<10 µg/kg	TM089		156	<10
Total Aliphatics >C5-C12	<10 µg/kg	TM089		376	<10
Aromatics >EC5-EC7	<10 µg/kg	TM089		<10	<10
Aromatics >EC7-EC8	<10 µg/kg	TM089		<10	<10
Aromatics >EC8-EC10	<10 µg/kg	TM089		156	<10
Aromatics >EC10-EC12	<10 µg/kg	TM089		104	<10
Total Aromatics >EC5-EC12	<10 µg/kg	TM089		266	<10
m,p,o-Xylene	<10 µg/kg	TM089		<10	<10
BTEX, Total	<10 µg/kg	TM089		23.6	<10

SDG:	100927-62	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100308

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	WS11	WS9
			Depth (m)	2.50 - 3.00	0.30
			Sample Type	Soil/Solid	Soil/Solid
			Date Sampled	23/09/2010	23/09/2010
			Date Received	25/09/2010	25/09/2010
			SDG Ref	100927-62	100927-62
			Lab Sample No.(s)	2154297	2154281
			AGS Reference		
Dibromofluoromethane**	%	TM116		101	99.4
Toluene-d8**	%	TM116		79.9	94.9
4-Bromofluorobenzene**	%	TM116		163	130
Dichlorodifluoromethane	<4 µg/kg	TM116		<4 M	<4 M
Chloromethane	<7 µg/kg	TM116		<7 #	<7 #
Vinyl Chloride	<10 µg/kg	TM116		<10 #	<10 #
Bromomethane	<13 µg/kg	TM116		<13 M	<13 M
Chloroethane	<14 µg/kg	TM116		<14 M	<14 M
Trichlorofluorormethane	<6 µg/kg	TM116		<6 M	<6 M
1.1-Dichloroethene	<10 µg/kg	TM116		<10 #	<10 #
Carbon Disulphide	<7 µg/kg	TM116		47.1 M	<7 M
Dichloromethane	<10 µg/kg	TM116		58.5 #	<10 #
Methyl Tertiary Butyl Ether	<11 µg/kg	TM116		<11 M	<11 M
trans-1-2-Dichloroethene	<11 µg/kg	TM116		<11 M	<11 M
1.1-Dichloroethane	<8 µg/kg	TM116		<8 M	<8 M
cis-1-2-Dichloroethene	<5 µg/kg	TM116		<5 M	<5 M
2.2-Dichloropropane	<12 µg/kg	TM116		<12 M	<12 M
Bromochloromethane	<14 µg/kg	TM116		<14 M	<14 M
Chloroform	<8 µg/kg	TM116		<8 M	<8 M
1.1.1-Trichloroethane	<7 µg/kg	TM116		<7 M	<7 M
1.1-Dichloropropene	<11 µg/kg	TM116		<11 M	<11 M
Carbontetrachloride	<14 µg/kg	TM116		<14 M	<14 M
1.2-Dichloroethane	<5 µg/kg	TM116		<5 M	<5 M
Benzene	<9 µg/kg	TM116		13.6 M	<9 M
Trichloroethene	<9 µg/kg	TM116		<9 M	<9 M
1.2-Dichloropropane	<12 µg/kg	TM116		<12 M	<12 M
Dibromomethane	<9 µg/kg	TM116		<9 M	<9 M
Bromodichloromethane	<7 µg/kg	TM116		<7 M	<7 M
cis-1-3-Dichloropropene	<14 µg/kg	TM116		<14 M	<14 M
Toluene	<5 µg/kg	TM116		15.4 M	<5 M
trans-1-3-Dichloropropene	<14 µg/kg	TM116		<14	<14
1.1.2-Trichloroethane	<10 µg/kg	TM116		<10 M	<10 M
1.3-Dichloropropane	<7 µg/kg	TM116		<7 #	<7 #
Tetrachloroethene	<5 µg/kg	TM116		23.6 M	<5 M
Dibromochloromethane	<13 µg/kg	TM116		<13 M	<13 M
1.2-Dibromoethane	<12 µg/kg	TM116		<12 M	<12 M
Chorobenzene	<5 µg/kg	TM116		<5 M	<5 M
1.1.1.2-Tetrachloroethane	<10 µg/kg	TM116		<10 M	<10 M
Ethylbenzene	<4 µg/kg	TM116		38.7 M	<4 M

SDG:	100927-62	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100308

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Customer Sample Ref.	WS11	WS9
Depth (m)	2.50 - 3.00	0.30
Sample Type	Soil/Solid	Soil/Solid
Date Sampled	23/09/2010	23/09/2010
Date Received	25/09/2010	25/09/2010
SDG Ref	100927-62	100927-62
Lab Sample No.(s)	2154297	2154281
AGS Reference		

Component	LOD/Units	Method		
p/m-Xylene	<14 µg/kg	TM116	25.8 #	<14 #
o-Xylene	<10 µg/kg	TM116	<10 M	<10 M
Styrene	<10 µg/kg	TM116	<10 M	<10 M
Bromoform	<10 µg/kg	TM116	<10 M	<10 M
Isopropylbenzene	<5 µg/kg	TM116	<5 M	<5 M
1.1.2.2-Tetrachloroethane	<10 µg/kg	TM116	<10 #	<10 #
1.2.3-Trichloropropane	<17 µg/kg	TM116	<17 M	<17 M
Bromobenzene	<10 µg/kg	TM116	<10 M	<10 M
Propylbenzene	<11 µg/kg	TM116	<11 M	<11 M
2-Chlorotoluene	<9 µg/kg	TM116	<9 M	<9 M
1.3.5-Trimethylbenzene	<8 µg/kg	TM116	<8 #	<8 #
4-Chlorotoluene	<12 µg/kg	TM116	<12 M	<12 M
tert-Butylbenzene	<12 µg/kg	TM116	<12 #	<12 #
1.2.4-Trimethylbenzene	<9 µg/kg	TM116	<9 #	<9 #
sec-Butylbenzene	<10 µg/kg	TM116	<10 M	<10 M
4-Isopropyltoluene	<11 µg/kg	TM116	<11 M	<11 M
1.3-Dichlorobenzene	<6 µg/kg	TM116	<6 M	<6 M
1.4-Dichlorobenzene	<5 µg/kg	TM116	<5 M	<5 M
n-Butylbenzene	<10 µg/kg	TM116	<10 M	<10 M
1.2-Dichlorobenzene	<12 µg/kg	TM116	<12 M	<12 M
1.2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M	<14 M
Tert-amyl methyl ether	<15 µg/kg	TM116	<15	<15
1.2.4-Trichlorobenzene	<6 µg/kg	TM116	<6 #	<6 #
Hexachlorobutadiene	<12 µg/kg	TM116	<12	<12
Naphthalene	<13 µg/kg	TM116	<13 M	<13 M
1.2.3-Trichlorobenzene	<6 µg/kg	TM116	<6 M	<6 M

Table of Results - Appendix

SDG Number : 100927-62 **Client :** H_GRONTMIJ_SOL **Client Ref :**

REPORT KEY

Results expressed as (e.g.) 1.03E-07 is equivalent to 1.03x10-7

NDP	No Determination Possible	#	ISO 17025 Accredited	*	Subcontracted Test	M	MCERTS Accredited
NFD	No Fibres Detected	PFD	Possible Fibres Detected	»	Result previously reported (Incremental reports only)	EC	Equivalent Carbon (Aromatics C8-C35)

Note: Method detection limits are not always achievable due to various circumstances beyond our control

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
PM001		Preparation of Samples for Metals Analysis		
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material		
TM001	In - house Method	Determination of asbestos containing material by screening on solids		
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC		
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)		
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS		
TM132	In - house Method	ELTRA CS800 Operators Guide		
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter		
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser		
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the 'Skalar SANS+ System' Segmented Flow Analyser		
TM157	HP 6890 Gas Chromatograph (GC) system and HP 5973 Mass Selective Detector (MSD).	Determination of SVOC in Soils by GC-MS extracted by sonication in DCM/Acetone		
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID		
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES		
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer		

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

APPENDIX

APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH_4 by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. Results relate only to the items tested
13. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 – 130 %.
14. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).
16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
18. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
19. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKE	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM	LIQUID/LIQUID SHAKE	GC MS
TRIAZINE HERBS	DCM	LIQUID/LIQUID SHAKE	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	NONE	DIRECT INJECTION	GC FID

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

ALcontrol Laboratories

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Grontmij
Radcliffe House
3rd Floor
Blenheim Court, Lode lane
Solihull
West Midlands
B912AA

Attention: Gareth Taylor

CERTIFICATE OF ANALYSIS

Date:	18 October 2010		
Customer:	H_GRONTMIJ_SOL-27		
Sample Delivery Group (SDG):	100923-110	**Report No.:**	100345
Your Reference:			
Location:	Stagborough		

We received 25 samples on Thursday September 23, 2010 and 10 of these samples were scheduled for analysis which was completed on Monday October 18, 2010. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Iain Swinton

Operations Director - Land UK & Ireland

mCERTS
UKAS TESTING
1291
GROUP

Validated

ALcontrol Laboratories Analytical Services

SDG:	100923-110	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100345

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
2129825	WS1			20/09/2010
2129814	WS1		0.30	20/09/2010
2129807	WS1		0.65	20/09/2010
2129832	WS1		2.10 - 2.30	20/09/2010
2129842	WS2			20/09/2010
2129685	WS2		0.30	20/09/2010
2129798	WS2		0.60	20/09/2010
2129795	WS2		1.50 - 1.70	20/09/2010
2129690	WS3			20/09/2010
2129848	WS3		0.35	20/09/2010
2129702	WS3		0.65	20/09/2010
2129709	WS3		1.20 - 1.50	20/09/2010
2129904	WS3		1.20 - 1.50	20/09/2010
2129721	WS4			21/09/2010
2129749	WS4		0.35	21/09/2010
2129715	WS4		0.65	21/09/2010
2129728	WS4		1.65 - 1.85	21/09/2010
2129733	WS4		3.50 - 3.80	21/09/2010
2129740	WS5			21/09/2010
2129746	WS5		0.30	21/09/2010
2129763	WS5		0.65	21/09/2010
2129771	WS5		1.30 - 1.55	21/09/2010
2129776	WS6			21/09/2010
2129757	WS6		0.35	21/09/2010
2129785	WS6		0.70	21/09/2010

Only received samples which have had analysis scheduled will be shown on the following pages.

Validated

ALcontrol Laboratories Analytical Services

SDG:	100923-110	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100345

SOLID

Results Legend

X Test

N No Determination Possible

			Lab Sample No(s)	2129702	2129709	2129721	2129728	2129733	2129746	2129757	2129798	2129814	2129825
			Customer Sample Ref.	WS3	WS3	WS4	WS4	WS4	WS5	WS6	WS2	WS1	WS1
			AGS Ref.										
			Depth (m)	0.65	1.20 - 1.50		1.65 - 1.85	3.50 - 3.80	0.30	0.35	0.60	0.30	
			Container	250g Amber Jar	400g Tub	60g VOC	20ml Glass Vial used in volatile	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	60g VOC	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub
Asbestos Containing Material Screen	All	NDPs: 0 Tests: 2			X																				X
Boron Water Soluble	All	NDPs: 0 Tests: 9		X				X		X		X		X		X		X		X		X		X	
CEN Readings	All	NDPs: 0 Tests: 1					X																		
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2			X																		X		
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1					X																		
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0 Tests: 4		X			X			X													X		
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 4		X			X			X													X		
GRO by GC-FID (S)	All	NDPs: 0 Tests: 4				X	X					X										X			
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 9			X			X		X		X		X		X		X		X		X			X
Mercury Dissolved	All	NDPs: 0 Tests: 1					X																		
Metals by iCap-OES (Soil)	Antimony	NDPs: 0 Tests: 2		X																			X		
	Arsenic	NDPs: 0 Tests: 9		X				X		X		X		X		X		X		X		X		X	
	Barium	NDPs: 0 Tests: 9		X				X		X		X		X		X		X		X		X		X	
	Beryllium	NDPs: 0 Tests: 9		X				X		X		X		X		X		X		X		X		X	
	Cadmium	NDPs: 0 Tests: 9		X				X		X		X		X		X		X		X		X		X	
	Chromium	NDPs: 0 Tests: 9		X				X		X		X		X		X		X		X		X		X	

Validated

ALcontrol Laboratories Analytical Services

SDG:	100923-110	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100345

SOLID

Results Legend

X — Test

N — No Determination Possible

			Lab Sample No(s)	2129702	2129709	2129721	2129728	2129733	2129746	2129757	2129798	2129814	2129825
			Customer Sample Ref.	WS3	WS3	WS4	WS4	WS4	WS5	WS6	WS2	WS1	WS1
			AGS Ref.										
			Depth (m)	0.65	1.20 - 1.50		1.65 - 1.85	3.50 - 3.80	0.30	0.35	0.60	0.30	
			Container	250g Amber Jar	400g Tub	60g VOC	20ml Glass Vial used in volatile	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	60g VOC	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	60g VOC	250g Amber Jar	400g Tub
Metals by iCap-OES (Soil)	Copper	NDPs: 0 Tests: 9		X				X	X	X		X		X	X	X	X	X		X	
	Lead	NDPs: 0 Tests: 9		X				X	X	X		X		X	X	X	X	X		X	
	Mercury	NDPs: 0 Tests: 9		X				X	X	X		X		X	X	X	X	X		X	
	Nickel	NDPs: 0 Tests: 9		X				X	X	X		X		X	X	X	X	X		X	
	Selenium	NDPs: 0 Tests: 9		X				X	X	X		X		X	X	X	X	X		X	
	Vanadium	NDPs: 0 Tests: 9		X				X	X	X		X		X	X	X	X	X		X	
	Zinc	NDPs: 0 Tests: 9		X				X	X	X		X		X	X	X	X	X		X	
pH	All	NDPs: 0 Tests: 9			X				X	X	X		X		X	X	X	X	X		X	X
Sample description	All	NDPs: 0 Tests: 10		X			X	X	X	X		X		X	X	X	X	X		X	
Semi Volatile Organic Compounds	All	NDPs: 0 Tests: 4		X			X			X								X				
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 1					X															
Total Organic Carbon	All	NDPs: 0 Tests: 9		X				X	X	X		X		X	X	X	X	X		X	
TPH by IR Oils and Greases	All	NDPs: 0 Tests: 1					X															
TPH CWG GC (S)	All	NDPs: 0 Tests: 4		X			X			X								X				
VOC MS (S)	All	NDPs: 0 Tests: 4				X	X				X									X		
VOC MS (W)	All	NDPs: 0 Tests: 1					X															

Validated

ALcontrol Laboratories Analytical Services

SDG:	100923-110	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100345

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Grain size	Inclusions	Inclusions 2
2129702	WS3	0.65	Light Brown	Loamy Sand	0.1 - 2 mm	Stones	None
2129709	WS3	1.20 - 1.50	Dark Brown	Sand	0.1 - 2 mm	Stones	None
2129721	WS4		Dark Brown	Top Soil	0.063 - 0.1 mm	Stones	Vegetation
2129728	WS4	1.65 - 1.85	Light Brown	Sandy Clay	0.1 - 2 mm	Stones	None
2129733	WS4	3.50 - 3.80	Dark Brown	Sand	0.1 - 2 mm	Stones	None
2129746	WS5	0.30	Light Brown	Clay Loam	0.063 - 0.1 mm	Stones	None
2129757	WS6	0.35	Light Brown	Sandy Loam	0.1 - 2 mm	Stones	None
2129798	WS2	0.60	Light Brown	Clay Loam	0.063 - 0.1 mm	Stones	None
2129814	WS1	0.30	Light Brown	Silty Clay Loam	0.063 - 0.1 mm	Stones	None
2129825	WS1		Dark Brown	Sandy Loam	0.1 - 2 mm	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Validated

ALcontrol Laboratories Analytical Services

SDG:	100923-110	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100345

Test Completion Dates

Lab Sample No(s)	2129702	2129709	2129721	2129728	2129733	2129746	2129757	2129798	2129814	2129825
Customer Sample Ref.	WS3	WS3	WS4	WS4	WS4	WS5	WS6	WS2	WS1	WS1
AGS Ref.										
Depth	0.65	1.20 - 1.50		1.65 - 1.85	3.50 - 3.80	0.30	0.35	0.60	0.30	
Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Asbestos Containing Material Screen	11/10/2010									11/10/2010
Boron Water Soluble	13/10/2010		13/10/2010	13/10/2010	12/10/2010	13/10/2010	12/10/2010	12/10/2010	12/10/2010	12/10/2010
CEN 2:1 Leachate (1 Stage)		11/10/2010								
CEN Readings		13/10/2010								
Cyanide Comp/Free/Total/Thiocyanate	12/10/2010								12/10/2010	
Dissolved Metals by ICP-MS		14/10/2010								
EPH CWG (Aliphatic) GC (S)	13/10/2010	13/10/2010			13/10/2010				13/10/2010	
EPH CWG (Aromatic) GC (S)	13/10/2010	13/10/2010			13/10/2010				13/10/2010	
GRO by GC-FID (S)	18/10/2010	13/10/2010			15/10/2010				12/10/2010	
Hexavalent Chromium (s)	13/10/2010		13/10/2010	13/10/2010	13/10/2010	13/10/2010	13/10/2010	13/10/2010	13/10/2010	13/10/2010
Mercury Dissolved		14/10/2010								
Metals by iCap-OES (Soil)	14/10/2010		14/10/2010	14/10/2010	14/10/2010	14/10/2010	15/10/2010	15/10/2010	15/10/2010	14/10/2010
pH	12/10/2010		12/10/2010	12/10/2010	12/10/2010	12/10/2010	12/10/2010	12/10/2010	12/10/2010	12/10/2010
Sample description	11/10/2010	11/10/2010	11/10/2010	11/10/2010	11/10/2010	11/10/2010	11/10/2010	11/10/2010	11/10/2010	11/10/2010
Semi Volatile Organic Compounds	13/10/2010	13/10/2010			13/10/2010				13/10/2010	
SVOC MS (W) - Aqueous		15/10/2010								
Total Organic Carbon	13/10/2010		13/10/2010	13/10/2010	12/10/2010	13/10/2010	12/10/2010	12/10/2010	12/10/2010	12/10/2010
TPH by IR Oils and Greases		14/10/2010								
TPH CWG GC (S)	18/10/2010	13/10/2010			15/10/2010				13/10/2010	
VOC MS (S)	15/10/2010	15/10/2010			18/10/2010				15/10/2010	
VOC MS (W)		13/10/2010								

Validated

ALcontrol Laboratories Analytical Services

SDG:	100923-110	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100345

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	WS1	WS1	WS2	WS3	WS3	WS4
			Depth (m)		0.30	0.60	0.65	1.20 - 1.50	
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	20/09/2010	20/09/2010	20/09/2010	20/09/2010	20/09/2010	21/09/2010
			Date Received	23/09/2010	23/09/2010	23/09/2010	23/09/2010	23/09/2010	23/09/2010
			SDG Ref	100923-110	100923-110	100923-110	100923-110	100923-110	100923-110
			Lab Sample No.(s)	2129825	2129814	2129798	2129702	2129709	2129721
			AGS Reference						
Moisture	%	PM114						11.1	
Moisture content ratio	%	PM114						12.4	
Dry matter content ratio	%	PM114						89	
Asbestos Containing Material Screen	-	TM001		No ACM Detected			No ACM Detected		
Soil Organic Matter (SOM)	<0.35 %	TM132		2.78 #	2.26 #	7.78 #	1.1 #		8.86 #
pH	1 pH Units	TM133		6.67 M	7.93 M	5.21 M	7.03 M		7.26 M
Chromium, Hexavalent	<0.6 mg/kg	TM151		<0.6 #	<0.6 #	<0.6 #	<0.6 #		<0.6 #
Cyanide, Total	<1 mg/kg	TM153			<1 M		<1 M		
Thiocyanate	<1 mg/kg	TM153			<1 M		<1 M		
Antimony	<0.6 mg/kg	TM181			1.67 #		<0.6 #		
Arsenic	<0.6 mg/kg	TM181		6.3 M	5.4 M	10.5 M	6.52 M		8.29 M
Barium	<0.6 mg/kg	TM181		70.6 #	61.3 #	167 #	42.7 #		161 #
Beryllium	<0.01 mg/kg	TM181		0.677	0.599	1.46	0.606 M		1.05 M
Cadmium	<0.02 mg/kg	TM181		0.501 M	0.445 M	0.827 M	0.362 M		0.917 M
Chromium	<0.9 mg/kg	TM181		12.7 M	13.9 M	17.6 M	17.9 M		14.9 M
Copper	<1.4 mg/kg	TM181		19.5 M	21.5 M	35.8 M	9.17 M		44.4 M
Lead	<0.7 mg/kg	TM181		29.8 M	20.2 M	38.5 M	16.7 M		127 M
Mercury	<0.14 mg/kg	TM181		<0.14 M	<0.14 M	<0.14 M	<0.14 M		<0.14 M
Nickel	<0.2 mg/kg	TM181		13.8 M	15.1 M	37.1 M	12.9 M		17 M
Selenium	<1 mg/kg	TM181		<1 #	<1 #	1.96 #	1.12 #		1.05 #
Vanadium	<0.2 mg/kg	TM181		20.9 #	15.7 #	27.9 #	22.5 #		19.2 #
Zinc	<1.9 mg/kg	TM181		68.3 M	57.4 M	107 M	47.4 M		212 M
Boron, water soluble	<1 mg/kg	TM222		<1 M	<1 M	1.41 M	<1 M		<1 M

SDG:	100923-110	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100345

Semi Volatile Organic Compounds

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	WS1	WS3	WS3
			Depth (m)	0.30	0.65	1.20 - 1.50
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	20/09/2010	20/09/2010	20/09/2010
			Date Received	23/09/2010	23/09/2010	23/09/2010
			SDG Ref	100923-110	100923-110	100923-110
			Lab Sample No.(s)	2129814	2129702	2129709
			AGS Reference			
Phenol	<100 µg/kg	TM157		<100	<100	<100
Pentachlorophenol	<100 µg/kg	TM157		<100	<100	<100
n-Nitroso-n-dipropylamine	<100 µg/kg	TM157		<100	<100	<100
Nitrobenzene	<100 µg/kg	TM157		<100	<100	<100
Isophorone	<100 µg/kg	TM157		<100	<100	<100
Hexachloroethane	<100 µg/kg	TM157		<100	<100	<100
Hexachlorocyclopentadiene	<100 µg/kg	TM157		<100	<200	<100
Hexachlorobutadiene	<100 µg/kg	TM157		<100	<100	<100
Hexachlorobenzene	<100 µg/kg	TM157		<100	<100	<100
n-Dioctyl phthalate	<100 µg/kg	TM157		<100	<100	<100
Dimethyl phthalate	<100 µg/kg	TM157		<100	<100	<100
Diethyl phthalate	<100 µg/kg	TM157		<100	<100	<100
n-Dibutyl phthalate	<100 µg/kg	TM157		<100	<100	<100
Dibenzofuran	<100 µg/kg	TM157		<100	343	<100
Carbazole	<100 µg/kg	TM157		<100	<100	<100
Butylbenzyl phthalate	<100 µg/kg	TM157		<100	<100	<100
bis(2-Ethylhexyl) phthalate	<100 µg/kg	TM157		<100	<100	115
bis(2-Chloroethoxy)methane	<100 µg/kg	TM157		<100	<100	<100
bis(2-Chloroethyl)ether	<100 µg/kg	TM157		<100	<100	<100
Azobenzene	<100 µg/kg	TM157		<100	<100	<100
4-Nitrophenol	<100 µg/kg	TM157		<100	<100	<100
4-Nitroaniline	<100 µg/kg	TM157		<100	<100	<100
4-Methylphenol	<100 µg/kg	TM157		<100	<100	<100
4-Chlorophenylphenylether	<100 µg/kg	TM157		<100	<100	<100
4-Chloroaniline	<100 µg/kg	TM157		<100	<100	<100
4-Chloro-3-methylphenol	<100 µg/kg	TM157		<100	<100	<100
4-Bromophenylphenylether	<100 µg/kg	TM157		<100	<100	<100
3-Nitroaniline	<100 µg/kg	TM157		<100	<100	<100
2-Nitrophenol	<100 µg/kg	TM157		<100	<100	<100
2-Nitroaniline	<100 µg/kg	TM157		<100	<100	<100
2-Methylphenol	<100 µg/kg	TM157		<100	<100	<100
1,2,4-Trichlorobenzene	<100 µg/kg	TM157		<100	<100	<100
2-Chlorophenol	<100 µg/kg	TM157		<100	<100	<100
2,6-Dinitrotoluene	<100 µg/kg	TM157		<100	<100	<100
2,4-Dinitrotoluene	<100 µg/kg	TM157		<100	<100	<100
2,4-Dimethylphenol	<100 µg/kg	TM157		<100	<100	<100
2,4-Dichlorophenol	<100 µg/kg	TM157		<100	<100	<100
2,4,6-Trichlorophenol	<100 µg/kg	TM157		<100	<100	<100
2,4,5-Trichlorophenol	<100 µg/kg	TM157		<100	<100	<100

ALcontrol Laboratories Analytical Services

SDG: 100923-110
Job: H_GRONTMIJ_SOL-27
Client Reference:
Location: Stagborough

Customer: Grontmij
Attention: Gareth Taylor
Order No.:
Report No: 100345

Semi Volatile Organic Compounds

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Customer Sample Ref.			WS1	WS3	WS3
Depth (m)			0.30	0.65	1.20 - 1.50
Sample Type			Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled			20/09/2010	20/09/2010	20/09/2010
Date Received			23/09/2010	23/09/2010	23/09/2010
SDG Ref			100923-110	100923-110	100923-110
Lab Sample No.(s)			2129814	2129702	2129709
AGS Reference					
Component	**LOD/Units**	**Method**			
1,4-Dichlorobenzene	<100 µg/kg	TM157	<100	<100	<100
1,3-Dichlorobenzene	<100 µg/kg	TM157	<100	<100	<100
1,2-Dichlorobenzene	<100 µg/kg	TM157	<100	<100	<100
2-Chloronaphthalene	<100 µg/kg	TM157	<100	<100	<100
2-Methylnaphthalene	<100 µg/kg	TM157	<100	227	<100
Acenaphthylene	<100 µg/kg	TM157	<100	<100	<100
Acenaphthene	<100 µg/kg	TM157	<100	585	<100
Anthracene	<100 µg/kg	TM157	<100	<100	<100
Benzo(a)anthracene	<100 µg/kg	TM157	<100	<100	<100
Benzo(b)fluoranthene	<100 µg/kg	TM157	<100	<100	<100
Benzo(k)fluoranthene	<100 µg/kg	TM157	<100	<100	<100
Benzo(a)pyrene	<100 µg/kg	TM157	<100	<100	<100
Benzo(g,h,i)perylene	<100 µg/kg	TM157	<100	<100	<100
Chrysene	<100 µg/kg	TM157	<100	<100	<100
Fluoranthene	<100 µg/kg	TM157	<100	<100	<100
Fluorene	<100 µg/kg	TM157	<100	278	<100
Indeno(1,2,3-cd)pyrene	<100 µg/kg	TM157	<100	<100	<100
Phenanthrene	<100 µg/kg	TM157	<100	257	<100
Pyrene	<100 µg/kg	TM157	<100	<100	<100
Naphthalene	<100 µg/kg	TM157	<100	290	<100
Dibenzo(a,h)anthracene	<100 µg/kg	TM157	<100	<100	<100

SDG:	100923-110	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100345

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	WS1	WS3	WS3
			Depth (m)	0.30	0.65	1.20 - 1.50
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	20/09/2010	20/09/2010	20/09/2010
			Date Received	23/09/2010	23/09/2010	23/09/2010
			SDG Ref	100923-110	100923-110	100923-110
			Lab Sample No.(s)	2129814	2129702	2129709
			AGS Reference			
Aliphatics >C12-C16	<100 µg/kg	TM173		4460	6220	472
Aliphatics >C16-C21	<100 µg/kg	TM173		6150	1670	117
Aliphatics >C21-C35	<100 µg/kg	TM173		12600	4390	3880
Aliphatics >C35-C44	<100 µg/kg	TM173		1910	<100	<100
Aromatics >EC12-EC16	<100 µg/kg	TM173		6820	406	<100
Aromatics >EC16-EC21	<100 µg/kg	TM173		10400	<100	<100
Aromatics >EC21-EC35	<100 µg/kg	TM173		20100	<100	6850
Aromatics >EC35-EC44	<100 µg/kg	TM173		9700	<100	<100
Aromatics >EC40-EC44	<100 µg/kg	TM173		4260	<100	<100
Total Aliphatics >C12-C44	<100 µg/kg	TM173		25100	12300	4460
Total Aromatics >EC12-EC44	<100 µg/kg	TM173		47000	406	6850
Total Aliphatics >C5-35	<100 µg/kg	TM173		23200	12300	4470
Total Aliphatics >C5-C44	<100 µg/kg	TM173		25100	12300	4470
Total Aromatics >C5-35	<100 µg/kg	TM173		37300	406	6850
Total Aromatics >C6-C44	<100 µg/kg	TM173		47000	406	6850
Total Aliphatics & Aromatics >C5-35	<100 µg/kg	TM173		60600	12700	11300
Total Aliphatics & Aromatics >C5-C44	<100 µg/kg	TM173		72200	12700	11300
GRO Surrogate % recovery**	%	TM089		99	124	121
GRO >C5-C12	<44 µg/kg	TM089		<44	<44	<44
Methyl tertiary butyl ether (MTBE)	<5 µg/kg	TM089		<5 #	<5 #	<5
Benzene	<10 µg/kg	TM089		<10 M	<10 M	<10
Toluene	<2 µg/kg	TM089		<2 M	<2 M	<2
Ethylbenzene	<3 µg/kg	TM089		3.26 M	<3 M	<3
m,p-Xylene	<6 µg/kg	TM089		<6 M	<6 M	<6
o-Xylene	<3 µg/kg	TM089		<3 M	<3 M	<3
Aliphatics >C5-C6	<10 µg/kg	TM089		<10	<10	<10
Aliphatics >C6-C8	<10 µg/kg	TM089		<10	<10	<10
Aliphatics >C8-C10	<10 µg/kg	TM089		<10	<10	<10
Aliphatics >C10-C12	<10 µg/kg	TM089		<10	<10	<10
Total Aliphatics >C5-C12	<10 µg/kg	TM089		16.3	<10	<10
Aromatics >EC5-EC7	<10 µg/kg	TM089		<10	<10	<10
Aromatics >EC7-EC8	<10 µg/kg	TM089		<10	<10	<10
Aromatics >EC8-EC10	<10 µg/kg	TM089		<10	<10	<10
Aromatics >EC10-EC12	<10 µg/kg	TM089		<10	<10	<10
Total Aromatics >EC5-EC12	<10 µg/kg	TM089		13	<10	<10
m,p,o-Xylene	<10 µg/kg	TM089		<10	<10	<10
BTEX, Total	<10 µg/kg	TM089		<10	<10	<10

SDG:	100923-110	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100345

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Customer Sample Ref.	WS1	WS3	WS3
Depth (m)	0.30	0.65	1.20 - 1.50
Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
Date Sampled	20/09/2010	20/09/2010	20/09/2010
Date Received	23/09/2010	23/09/2010	23/09/2010
SDG Ref	100923-110	100923-110	100923-110
Lab Sample No.(s)	2129814	2129702	2129709
AGS Reference			

Component	LOD/Units	Method			
Dibromofluoromethane**	%	TM116	108	105	99.5
Toluene-d8**	%	TM116	93.3	96.4	99.8
4-Bromofluorobenzene**	%	TM116	110	109	97.6
Dichlorodifluoromethane	<4 µg/kg	TM116	<4 M	<4 M	<4
Chloromethane	<7 µg/kg	TM116	<7 #	<7 #	<7
Vinyl Chloride	<10 µg/kg	TM116	<10 #	<10 #	<10
Bromomethane	<13 µg/kg	TM116	<13 M	<13 M	<13
Chloroethane	<14 µg/kg	TM116	<14 M	<14 M	<14
Trichlorofluorormethane	<6 µg/kg	TM116	<6 M	<6 M	<6
1.1-Dichloroethene	<10 µg/kg	TM116	<10 #	<10 #	<10
Carbon Disulphide	<7 µg/kg	TM116	<7 M	<7 M	<7
Dichloromethane	<10 µg/kg	TM116	<10 #	<10 #	<10
Methyl Tertiary Butyl Ether	<11 µg/kg	TM116	<11 M	<11 M	<11
trans-1-2-Dichloroethene	<11 µg/kg	TM116	<11 M	<11 M	<11
1.1-Dichloroethane	<8 µg/kg	TM116	<8 M	<8 M	<8
cis-1-2-Dichloroethene	<5 µg/kg	TM116	<5 M	<5 M	<5
2.2-Dichloropropane	<12 µg/kg	TM116	<12 M	<12 M	<12
Bromochloromethane	<14 µg/kg	TM116	<14 M	<14 M	<14
Chloroform	<8 µg/kg	TM116	<8 M	<8 M	<8
1.1.1-Trichloroethane	<7 µg/kg	TM116	<7 M	<7 M	<7
1.1-Dichloropropene	<11 µg/kg	TM116	<11 M	<11 M	<11
Carbontetrachloride	<14 µg/kg	TM116	<14 M	<14 M	<14
1.2-Dichloroethane	<5 µg/kg	TM116	<5 M	<5 M	<5
Benzene	<9 µg/kg	TM116	<9 M	<9 M	<9
Trichloroethene	<9 µg/kg	TM116	<9 M	<9 M	<9
1.2-Dichloropropane	<12 µg/kg	TM116	<12 M	<12 M	<12
Dibromomethane	<9 µg/kg	TM116	<9 M	<9 M	<9
Bromodichloromethane	<7 µg/kg	TM116	<7 M	<7 M	<7
cis-1-3-Dichloropropene	<14 µg/kg	TM116	<14 M	<14 M	<14
Toluene	<5 µg/kg	TM116	<5 M	<5 M	<5
trans-1-3-Dichloropropene	<14 µg/kg	TM116	<14	<14	<14
1.1.2-Trichloroethane	<10 µg/kg	TM116	<10 M	<10 M	<10
1.3-Dichloropropane	<7 µg/kg	TM116	<7 #	<7 #	<7
Tetrachloroethene	<5 µg/kg	TM116	<5 M	<5 M	<5
Dibromochloromethane	<13 µg/kg	TM116	<13 M	<13 M	<13
1.2-Dibromoethane	<12 µg/kg	TM116	<12 M	<12 M	<12
Chorobenzene	<5 µg/kg	TM116	<5 M	<5 M	<5
1.1.1.2-Tetrachloroethane	<10 µg/kg	TM116	<10 M	<10 M	<10
Ethylbenzene	<4 µg/kg	TM116	<4 M	<4 M	<4

SDG:	100923-110	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100345

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	WS1	WS3	WS3
			Depth (m)	0.30	0.65	1.20 - 1.50
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	20/09/2010	20/09/2010	20/09/2010
			Date Received	23/09/2010	23/09/2010	23/09/2010
			SDG Ref	100923-110	100923-110	100923-110
			Lab Sample No.(s)	2129814	2129702	2129709
			AGS Reference			
p/m-Xylene	<14 µg/kg	TM116		<14 #	<14 #	<14
o-Xylene	<10 µg/kg	TM116		<10 M	<10 M	<10
Styrene	<10 µg/kg	TM116		<10 M	<10 M	<10
Bromoform	<10 µg/kg	TM116		<10 M	<10 M	<10
Isopropylbenzene	<5 µg/kg	TM116		<5 M	<5 M	<5
1.1.2.2-Tetrachloroethane	<10 µg/kg	TM116		<10 #	<10 #	<10
1.2.3-Trichloropropane	<17 µg/kg	TM116		<17 M	<17 M	<17
Bromobenzene	<10 µg/kg	TM116		<10 M	<10 M	<10
Propylbenzene	<11 µg/kg	TM116		<11 M	<11 M	<11
2-Chlorotoluene	<9 µg/kg	TM116		<9 M	<9 M	<9
1.3.5-Trimethylbenzene	<8 µg/kg	TM116		<8 #	<8 #	<8
4-Chlorotoluene	<12 µg/kg	TM116		<12 M	<12 M	<12
tert-Butylbenzene	<12 µg/kg	TM116		<12 #	<12 #	<12
1.2.4-Trimethylbenzene	<9 µg/kg	TM116		<9 #	<9 #	<9
sec-Butylbenzene	<10 µg/kg	TM116		<10 M	<10 M	<10
4-Isopropyltoluene	<11 µg/kg	TM116		<11 M	<11 M	<11
1.3-Dichlorobenzene	<6 µg/kg	TM116		<6 M	<6 M	<6
1.4-Dichlorobenzene	<5 µg/kg	TM116		<5 M	<5 M	<5
n-Butylbenzene	<10 µg/kg	TM116		<10 M	<10 M	<10
1.2-Dichlorobenzene	<12 µg/kg	TM116		<12 M	<12 M	<12
1.2-Dibromo-3-chloropropane	<14 µg/kg	TM116		<14 M	<14 M	<14
Tert-amyl methyl ether	<15 µg/kg	TM116		<15	<15	<15
1.2.4-Trichlorobenzene	<6 µg/kg	TM116		<6 #	<6 #	<6
Hexachlorobutadiene	<12 µg/kg	TM116		<12	<12	<12
Naphthalene	<13 µg/kg	TM116		<13 M	<13 M	<13
1.2.3-Trichlorobenzene	<6 µg/kg	TM116		<6 M	<6 M	<6

Validated

ALcontrol Laboratories Analytical Services

SDG:	100923-110	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100345

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	WS4	WS4	WS5	WS6
			Depth (m)	1.65 - 1.85	3.50 - 3.80	0.30	0.35
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	21/09/2010	21/09/2010	21/09/2010	21/09/2010
			Date Received	23/09/2010	23/09/2010	23/09/2010	23/09/2010
			SDG Ref	100923-110	100923-110	100923-110	100923-110
			Lab Sample No.(s)	2129728	2129733	2129746	2129757
			AGS Reference				
Soil Organic Matter (SOM)	<0.35 %	TM132		<0.35 #	8.14 #	4.74 #	4.05 #
pH	1 pH Units	TM133		8.42 M	8.27 M	6.12 M	7.93 M
Chromium, Hexavalent	<0.6 mg/kg	TM151		<0.6 #	<0.6 #	<0.6 #	<1.2 #
Arsenic	<0.6 mg/kg	TM181		30.8 M	12.1 M	9 M	3.13 M
Barium	<0.6 mg/kg	TM181		361 #	342 #	166 #	174 #
Beryllium	<0.01 mg/kg	TM181		11 M	6.08	1.52 M	0.224
Cadmium	<0.02 mg/kg	TM181		3.86 M	0.925 M	0.883 M	0.237 M
Chromium	<0.9 mg/kg	TM181		32.7 M	23.2 M	18.6 M	8.61 M
Copper	<1.4 mg/kg	TM181		114 M	85.4 M	31.3 M	12.1 M
Lead	<0.7 mg/kg	TM181		186 M	29.1 M	35.5 M	16 M
Mercury	<0.14 mg/kg	TM181		<0.14 M	<0.14 M	<0.14 M	<0.14 M
Nickel	<0.2 mg/kg	TM181		116 M	81.2 M	35.2 M	6.68 M
Selenium	<1 mg/kg	TM181		1.61 #	1.2 #	1.89 #	<1 #
Vanadium	<0.2 mg/kg	TM181		102 #	75.6 #	27.1 #	11.6 #
Zinc	<1.9 mg/kg	TM181		1380 M	262 M	212 M	37.7 M
Boron, water soluble	<1 mg/kg	TM222		3.56 M	4.97 M	2.16 M	<1 M

SDG:	100923-110	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100345

Semi Volatile Organic Compounds

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Customer Sample Ref.			WS4
Depth (m)			3.50 - 3.80
Sample Type			Soil/Solid
Date Sampled			21/09/2010
Date Received			23/09/2010
SDG Ref			100923-110
Lab Sample No.(s)			2129733
AGS Reference			
Component	**LOD/Units**	**Method**	
Phenol	<100 µg/kg	TM157	<100
Pentachlorophenol	<100 µg/kg	TM157	<100
n-Nitroso-n-dipropylamine	<100 µg/kg	TM157	<100
Nitrobenzene	<100 µg/kg	TM157	<100
Isophorone	<100 µg/kg	TM157	<100
Hexachloroethane	<100 µg/kg	TM157	<100
Hexachlorocyclopentadiene	<100 µg/kg	TM157	<100
Hexachlorobutadiene	<100 µg/kg	TM157	<100
Hexachlorobenzene	<100 µg/kg	TM157	<100
n-Dioctyl phthalate	<100 µg/kg	TM157	<100
Dimethyl phthalate	<100 µg/kg	TM157	<100
Diethyl phthalate	<100 µg/kg	TM157	<100
n-Dibutyl phthalate	<100 µg/kg	TM157	<100
Dibenzofuran	<100 µg/kg	TM157	<100
Carbazole	<100 µg/kg	TM157	<100
Butylbenzyl phthalate	<100 µg/kg	TM157	<100
bis(2-Ethylhexyl) phthalate	<100 µg/kg	TM157	1580
bis(2-Chloroethoxy)methane	<100 µg/kg	TM157	<100
bis(2-Chloroethyl)ether	<100 µg/kg	TM157	<100
Azobenzene	<100 µg/kg	TM157	<100
4-Nitrophenol	<100 µg/kg	TM157	<100
4-Nitroaniline	<100 µg/kg	TM157	<100
4-Methylphenol	<100 µg/kg	TM157	<100
4-Chlorophenylphenylether	<100 µg/kg	TM157	<100
4-Chloroaniline	<100 µg/kg	TM157	<100
4-Chloro-3-methylphenol	<100 µg/kg	TM157	<100
4-Bromophenylphenylether	<100 µg/kg	TM157	<100
3-Nitroaniline	<100 µg/kg	TM157	<100
2-Nitrophenol	<100 µg/kg	TM157	<100
2-Nitroaniline	<100 µg/kg	TM157	<100
2-Methylphenol	<100 µg/kg	TM157	<100
1,2,4-Trichlorobenzene	<100 µg/kg	TM157	<100
2-Chlorophenol	<100 µg/kg	TM157	<100
2,6-Dinitrotoluene	<100 µg/kg	TM157	<100
2,4-Dinitrotoluene	<100 µg/kg	TM157	<100
2,4-Dimethylphenol	<100 µg/kg	TM157	<100
2,4-Dichlorophenol	<100 µg/kg	TM157	<100
2,4,6-Trichlorophenol	<100 µg/kg	TM157	<100
2,4,5-Trichlorophenol	<100 µg/kg	TM157	<100

SDG:	100923-110	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100345

Semi Volatile Organic Compounds

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	WS4
			Depth (m)	3.50 - 3.80
			Sample Type	Soil/Solid
			Date Sampled	21/09/2010
			Date Received	23/09/2010
			SDG Ref	100923-110
			Lab Sample No.(s)	2129733
			AGS Reference	
1,4-Dichlorobenzene	<100 µg/kg	TM157		<100
1,3-Dichlorobenzene	<100 µg/kg	TM157		<100
1,2-Dichlorobenzene	<100 µg/kg	TM157		<100
2-Chloronaphthalene	<100 µg/kg	TM157		<100
2-Methylnaphthalene	<100 µg/kg	TM157		<100
Acenaphthylene	<100 µg/kg	TM157		<100
Acenaphthene	<100 µg/kg	TM157		<100
Anthracene	<100 µg/kg	TM157		<100
Benzo(a)anthracene	<100 µg/kg	TM157		<100
Benzo(b)fluoranthene	<100 µg/kg	TM157		<100
Benzo(k)fluoranthene	<100 µg/kg	TM157		<100
Benzo(a)pyrene	<100 µg/kg	TM157		<100
Benzo(g,h,i)perylene	<100 µg/kg	TM157		<100
Chrysene	<100 µg/kg	TM157		<100
Fluoranthene	<100 µg/kg	TM157		127
Fluorene	<100 µg/kg	TM157		<100
Indeno(1,2,3-cd)pyrene	<100 µg/kg	TM157		<100
Phenanthrene	<100 µg/kg	TM157		249
Pyrene	<100 µg/kg	TM157		<100
Naphthalene	<100 µg/kg	TM157		<100
Dibenzo(a,h)anthracene	<100 µg/kg	TM157		<100

SDG:	100923-110	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100345

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref. WS4	
			Depth (m)	3.50 - 3.80
			Sample Type	Soil/Solid
			Date Sampled	21/09/2010
			Date Received	23/09/2010
			SDG Ref	100923-110
			Lab Sample No.(s)	2129733
			AGS Reference	
Aliphatics >C12-C16	<100 µg/kg	TM173	6800	
Aliphatics >C16-C21	<100 µg/kg	TM173	7580	
Aliphatics >C21-C35	<100 µg/kg	TM173	18700	
Aliphatics >C35-C44	<100 µg/kg	TM173	1880	
Aromatics >EC12-EC16	<100 µg/kg	TM173	12300	
Aromatics >EC16-EC21	<100 µg/kg	TM173	29200	
Aromatics >EC21-EC35	<100 µg/kg	TM173	60600	
Aromatics >EC35-EC44	<100 µg/kg	TM173	11100	
Aromatics >EC40-EC44	<100 µg/kg	TM173	3150	
Total Aliphatics >C12-C44	<100 µg/kg	TM173	35000	
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	113000	
Total Aliphatics >C5-35	<100 µg/kg	TM173	33200	
Total Aliphatics >C5-C44	<100 µg/kg	TM173	35100	
Total Aromatics >C5-35	<100 µg/kg	TM173	102000	
Total Aromatics >C6-C44	<100 µg/kg	TM173	113000	
Total Aliphatics & Aromatics >C5-35	<100 µg/kg	TM173	135000	
Total Aliphatics & Aromatics >C5-C44	<100 µg/kg	TM173	148000	
GRO Surrogate % recovery**	%	TM089	34	
GRO >C5-C12	<44 µg/kg	TM089	116	
Methyl tertiary butyl ether (MTBE)	<5 µg/kg	TM089	<5 #	
Benzene	<10 µg/kg	TM089	<10 M	
Toluene	<2 µg/kg	TM089	3.69 M	
Ethylbenzene	<3 µg/kg	TM089	4.92 M	
m,p-Xylene	<6 µg/kg	TM089	<6 M	
o-Xylene	<3 µg/kg	TM089	<3 M	
Aliphatics >C5-C6	<10 µg/kg	TM089	<10	
Aliphatics >C6-C8	<10 µg/kg	TM089	11.1	
Aliphatics >C8-C10	<10 µg/kg	TM089	29.5	
Aliphatics >C10-C12	<10 µg/kg	TM089	23.4	
Total Aliphatics >C5-C12	<10 µg/kg	TM089	66.4	
Aromatics >EC5-EC7	<10 µg/kg	TM089	<10	
Aromatics >EC7-EC8	<10 µg/kg	TM089	<10	
Aromatics >EC8-EC10	<10 µg/kg	TM089	28.3	
Aromatics >EC10-EC12	<10 µg/kg	TM089	16	
Total Aromatics >EC5-EC12	<10 µg/kg	TM089	49.2	
m,p,o-Xylene	<10 µg/kg	TM089	<10	
BTEX, Total	<10 µg/kg	TM089	<10	

SDG:	100923-110	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100345

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref. WS4
			Depth (m) 3.50 - 3.80
			Sample Type Soil/Solid
			Date Sampled 21/09/2010
			Date Received 23/09/2010
			SDG Ref 100923-110
			Lab Sample No.(s) 2129733
			AGS Reference
Dibromofluoromethane**	%	TM116	113
Toluene-d8**	%	TM116	72.3
4-Bromofluorobenzene**	%	TM116	153
Dichlorodifluoromethane	<4 µg/kg	TM116	<4 M
Chloromethane	<7 µg/kg	TM116	<7 #
Vinyl Chloride	<10 µg/kg	TM116	<10 #
Bromomethane	<13 µg/kg	TM116	<13 M
Chloroethane	<14 µg/kg	TM116	<14 M
Trichlorofluorormethane	<6 µg/kg	TM116	<6 M
1.1-Dichloroethene	<10 µg/kg	TM116	<10 #
Carbon Disulphide	<7 µg/kg	TM116	<7 M
Dichloromethane	<10 µg/kg	TM116	90.4 #
Methyl Tertiary Butyl Ether	<11 µg/kg	TM116	<11 M
trans-1-2-Dichloroethene	<11 µg/kg	TM116	<11 M
1.1-Dichloroethane	<8 µg/kg	TM116	<8 M
cis-1-2-Dichloroethene	<5 µg/kg	TM116	<5 M
2.2-Dichloropropane	<12 µg/kg	TM116	<12 M
Bromochloromethane	<14 µg/kg	TM116	<14 M
Chloroform	<8 µg/kg	TM116	13.6 M
1.1.1-Trichloroethane	<7 µg/kg	TM116	<7 M
1.1-Dichloropropene	<11 µg/kg	TM116	<11 M
Carbontetrachloride	<14 µg/kg	TM116	<14 M
1.2-Dichloroethane	<5 µg/kg	TM116	<5 M
Benzene	<9 µg/kg	TM116	23.7 M
Trichloroethene	<9 µg/kg	TM116	<9 M
1.2-Dichloropropane	<12 µg/kg	TM116	<12 M
Dibromomethane	<9 µg/kg	TM116	<9 M
Bromodichloromethane	<7 µg/kg	TM116	<7 M
cis-1-3-Dichloropropene	<14 µg/kg	TM116	<14 M
Toluene	<5 µg/kg	TM116	13.9 M
trans-1-3-Dichloropropene	<14 µg/kg	TM116	<14
1.1.2-Trichloroethane	<10 µg/kg	TM116	<10 M
1.3-Dichloropropane	<7 µg/kg	TM116	<7 #
Tetrachloroethene	<5 µg/kg	TM116	<5 M
Dibromochloromethane	<13 µg/kg	TM116	<13 M
1.2-Dibromoethane	<12 µg/kg	TM116	<12 M
Chorobenzene	<5 µg/kg	TM116	<5 M
1.1.1.2-Tetrachloroethane	<10 µg/kg	TM116	<10 M
Ethylbenzene	<4 µg/kg	TM116	12.3 M

SDG:	100923-110	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100345

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Customer Sample Ref.	WS4
Depth (m)	3.50 - 3.80
Sample Type	Soil/Solid
Date Sampled	21/09/2010
Date Received	23/09/2010
SDG Ref	100923-110
Lab Sample No.(s)	2129733
AGS Reference	

Component	LOD/Units	Method	
p/m-Xylene	<14 µg/kg	TM116	<14 #
o-Xylene	<10 µg/kg	TM116	<10 M
Styrene	<10 µg/kg	TM116	<10 M
Bromoform	<10 µg/kg	TM116	<10 M
Isopropylbenzene	<5 µg/kg	TM116	<5 M
1.1.2.2-Tetrachloroethane	<10 µg/kg	TM116	<10 #
1.2.3-Trichloropropane	<17 µg/kg	TM116	<17 M
Bromobenzene	<10 µg/kg	TM116	<10 M
Propylbenzene	<11 µg/kg	TM116	<11 M
2-Chlorotoluene	<9 µg/kg	TM116	<9 M
1.3.5-Trimethylbenzene	<8 µg/kg	TM116	<8 #
4-Chlorotoluene	<12 µg/kg	TM116	<12 M
tert-Butylbenzene	<12 µg/kg	TM116	<12 #
1.2.4-Trimethylbenzene	<9 µg/kg	TM116	<9 #
sec-Butylbenzene	<10 µg/kg	TM116	<10 M
4-Isopropyltoluene	<11 µg/kg	TM116	<11 M
1.3-Dichlorobenzene	<6 µg/kg	TM116	<6 M
1.4-Dichlorobenzene	<5 µg/kg	TM116	<5 M
n-Butylbenzene	<10 µg/kg	TM116	<10 M
1.2-Dichlorobenzene	<12 µg/kg	TM116	<12 M
1.2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M
Tert-amyl methyl ether	<15 µg/kg	TM116	<15
1.2.4-Trichlorobenzene	<6 µg/kg	TM116	<6 #
Hexachlorobutadiene	<12 µg/kg	TM116	<12
Naphthalene	<13 µg/kg	TM116	<13 M
1.2.3-Trichlorobenzene	<6 µg/kg	TM116	<6 M

CEN 2:1 ONE STAGE BATCH TEST

REF-CEN12457-3

Client Reference		**Client Location**	Stagborough
Mass Sample taken (kg)	0.197	**Moisture Content Ratio (%)**	12.4
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	89.0
Particle Size <4mm	>95%		

Case				
SDG	100923-110			
Lab Sample Number(s)	2129709			
Sampled Date	20-Sep-2010			
Customer Sample Ref.	WS3			
Depth (m)	1.20 - 1.50			

Solid Waste Analysis

Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	<0.01	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis

	Conc^{n} in 2:1 eluate (mg/l) C_2		2:1 conc^{n} leached (mg/kg) $A2_2$		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.000228	<0.00012	0.000456	<0.0012	-	-	-
Barium	-	-	-	-	-	-	-
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	-	-	-
Chromium	0.00049	<0.00022	0.00098	<0.0022	-	-	-
Copper	0.000885	<0.00085	0.00177	<0.0085	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	-	-	-
Molybdenum	-	-	-	-	-	-	-
Nickel	0.000836	<0.00015	0.00167	<0.0015	-	-	-
Lead	0.000331	<0.00002	0.000662	<0.0002	-	-	-
Antimony	-	-	-	-	-	-	-
Selenium	<0.00039	<0.00039	<0.00078	<0.0039	-	-	-
Zinc	0.00268	<0.00041	0.00536	<0.0041	-	-	-
Chloride	-	-	-	-	-	-	-
Fluoride	-	-	-	-	-	-	-
Sulphate (soluble)	-	-	-	-	-	-	-
Total Dissolved Solids	-	-	-	-	-	-	-
Total Monohydric Phenols (W)	-	-	-	-	-	-	-
Dissolved Organic Carbon	-	-	-	-	-	-	-

Leach Test Information

Date Prepared	11-Oct-2010
pH (pH Units)	6.79
Conductivity (µS/cm)	99.70
Temperature (ºC)	21.80
Volume Leachant (Litres)	0.328
Volume of Eluate VE1 (Litres)	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable

Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation

Mcerts Certification does not apply to leachates

CEN 2:1 ONE STAGE BATCH TEST

REF-CEN12457-3

Client Reference		**Client Location**	Stagborough
Mass Sample taken (kg)	0.197	**Moisture Content Ratio (%)**	12.4
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	89.0
Particle Size <4mm	>95%		

Case				
SDG	100923-110			
Lab Sample Number(s)	2129709			
Sampled Date	20-Sep-2010			
Customer Sample Ref.	WS3			
Depth (m)	1.20 - 1.50			

Solid Waste Analysis

Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	<0.01	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**Conc^{n} in 2:1 eluate (mg/l) C_2**		**2:1 conc^{n} leached (mg/kg) $A2_2$**		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
1,1,1,2-Tetrachloroethane	<0.0013	<0.0013	<0.0026	<0.013	-	-	-
1,1,1-Trichloroethane	<0.0013	<0.0013	<0.0026	<0.013	-	-	-
1,1,2,2-Tetrachloroethane	<0.0052	<0.0052	<0.0104	<0.052	-	-	-
1,1,2-Trichloroethane	<0.0022	<0.0022	<0.0044	<0.022	-	-	-
1,1-Dichloroethane	<0.0012	<0.0012	<0.0024	<0.012	-	-	-
1,1-Dichloroethene	<0.0012	<0.0012	<0.0024	<0.012	-	-	-
1,1-Dichloropropene	<0.0013	<0.0013	<0.0026	<0.013	-	-	-
1,2,3-Trichlorobenzene	<0.0031	<0.0031	<0.0062	<0.031	-	-	-
1,2,3-Trichloropropane	<0.0078	<0.0078	<0.0156	<0.078	-	-	-
1,2,4-Trichlorobenzene	<0.0023	<0.0023	<0.0046	<0.023	-	-	-
1,2,4-Trimethylbenzene	<0.0017	<0.0017	<0.0034	<0.017	-	-	-
1,2-Dibromo-3-Chloropropane	<0.0098	<0.0098	<0.0196	<0.098	-	-	-
1,2-Dibromoethane	<0.0023	<0.0023	<0.0046	<0.023	-	-	-
1,2-Dichlorobenzene	<0.0037	<0.0037	<0.0074	<0.037	-	-	-
1,2-Dichloroethane	<0.0033	<0.0033	<0.0066	<0.033	-	-	-
1,2-Dichloropropane	<0.003	<0.003	<0.006	<0.03	-	-	-
1,3,5-Trichlorobenzene	<0.01	<0.01	<0.02	<0.1	-	-	-
1,3,5-Trimethylbenzene	<0.0018	<0.0018	<0.0036	<0.018	-	-	-
1,3-Dichlorobenzene	<0.0022	<0.0022	<0.0044	<0.022	-	-	-

Leach Test Information

Date Prepared	11-Oct-2010
pH (pH Units)	6.79
Conductivity (µS/cm)	99.70
Temperature (°C)	21.80
Volume Leachant (Litres)	0.328
Volume of Eluate VE1 (Litres)	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable

Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation

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CEN 2:1 ONE STAGE BATCH TEST

REF-CEN12457-3

Client Reference		**Client Location**	Stagborough
Mass Sample taken (kg)	0.197	**Moisture Content Ratio (%)**	12.4
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	89.0
Particle Size <4mm	>95%		

Case				
SDG	100923-110			
Lab Sample Number(s)	2129709			
Sampled Date	20-Sep-2010			
Customer Sample Ref.	WS3			
Depth (m)	1.20 - 1.50			

Solid Waste Analysis

Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	<0.01	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**Conc^{n} in 2:1 eluate (mg/l) C_2**		**2:1 conc^{n} leached (mg/kg) $A2_2$**		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
1,3-Dichloropropane	<0.0022	<0.0022	<0.0044	<0.022	-	-	-
1,4-Dichlorobenzene	<0.0027	<0.0027	<0.0054	<0.027	-	-	-
2,2-Dichloropropane	<0.0038	<0.0038	<0.0076	<0.038	-	-	-
2,4,5-Trichlorophenol	<0.001	<0.001	<0.002	<0.01	-	-	-
2,4,6-Trichlorophenol	<0.001	<0.001	<0.002	<0.01	-	-	-
2,4-Dichlorophenol	<0.001	<0.001	<0.002	<0.01	-	-	-
2,4-Dimethylphenol	<0.001	<0.001	<0.002	<0.01	-	-	-
2,4-Dinitrotoluene	<0.001	<0.001	<0.002	<0.01	-	-	-
2,6-Dinitrotoluene	<0.001	<0.001	<0.002	<0.01	-	-	-
2-Chloronaphthalene	<0.001	<0.001	<0.002	<0.01	-	-	-
2-Chlorophenol	<0.001	<0.001	<0.002	<0.01	-	-	-
2-Chlorotoluene	<0.0019	<0.0019	<0.0038	<0.019	-	-	-
2-Methylnaphthalene	<0.001	<0.001	<0.002	<0.01	-	-	-
2-Methylphenol	<0.001	<0.001	<0.002	<0.01	-	-	-
2-Nitroaniline	<0.001	<0.001	<0.002	<0.01	-	-	-
2-Nitrophenol	<0.001	<0.001	<0.002	<0.01	-	-	-
3-Nitroaniline	<0.001	<0.001	<0.002	<0.01	-	-	-
4-Bromofluorobenzene	-	-	-	-	-	-	-
4-Bromophenylphenylether	<0.001	<0.001	<0.002	<0.01	-	-	-

Leach Test Information

Date Prepared	11-Oct-2010
pH (pH Units)	6.79
Conductivity (µS/cm)	99.70
Temperature (°C)	21.80
Volume Leachant (Litres)	0.328
Volume of Eluate VE1 (Litres)	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable

Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation

Mcerts Certification does not apply to leachates

CEN 2:1 ONE STAGE BATCH TEST

REF-CEN12457-3

Client Reference		**Client Location**	Stagborough
Mass Sample taken (kg)	0.197	**Moisture Content Ratio (%)**	12.4
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	89.0
Particle Size <4mm	>95%		

Case				
SDG	100923-110			
Lab Sample Number(s)	2129709			
Sampled Date	20-Sep-2010			
Customer Sample Ref.	WS3			
Depth (m)	1.20 - 1.50			

Solid Waste Analysis

Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	<0.01	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**Conc^{n} in 2:1 eluate (mg/l) C_2**		**2:1 conc^{n} leached (mg/kg) $A2_2$**		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
4-Chloro-3-methylphenol	<0.001	<0.001	<0.002	<0.01	-	-	-
4-Chloroaniline	<0.001	<0.001	<0.002	<0.01	-	-	-
4-Chlorophenylphenylether	<0.001	<0.001	<0.002	<0.01	-	-	-
4-Chlorotoluene	<0.0019	<0.0019	<0.0038	<0.019	-	-	-
4-Isopropyltoluene	<0.0026	<0.0026	<0.0052	<0.026	-	-	-
4-Methylphenol	<0.001	<0.001	<0.002	<0.01	-	-	-
4-Nitroaniline	<0.001	<0.001	<0.002	<0.01	-	-	-
4-Nitrophenol	<0.001	<0.001	<0.002	<0.01	-	-	-
Acenaphthene	<0.001	<0.001	<0.002	<0.01	-	-	-
Acenaphthylene	<0.001	<0.001	<0.002	<0.01	-	-	-
Anthracene	<0.001	<0.001	<0.002	<0.01	-	-	-
Azobenzene	<0.001	<0.001	<0.002	<0.01	-	-	-
Benzene	<0.0013	<0.0013	<0.0026	<0.013	-	-	-
Benzo(a)anthracene	<0.001	<0.001	<0.002	<0.01	-	-	-
Benzo(a)pyrene	<0.001	<0.001	<0.002	<0.01	-	-	-
Benzo(b)fluoranthene	<0.001	<0.001	<0.002	<0.01	-	-	-
Benzo(ghi)perylene	<0.001	<0.001	<0.002	<0.01	-	-	-
Benzo(k)fluoranthene	<0.001	<0.001	<0.002	<0.01	-	-	-
Bis(2-chloroethoxy)methane	<0.001	<0.001	<0.002	<0.01	-	-	-

Leach Test Information

Date Prepared	11-Oct-2010
pH (pH Units)	6.79
Conductivity (µS/cm)	99.70
Temperature (°C)	21.80
Volume Leachant (Litres)	0.328
Volume of Eluate VE1 (Litres)	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable

Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation

Mcerts Certification does not apply to leachates

CEN 2:1 ONE STAGE BATCH TEST

REF-CEN12457-3

Client Reference		**Client Location**	Stagborough
Mass Sample taken (kg)	0.197	**Moisture Content Ratio (%)**	12.4
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	89.0
Particle Size <4mm	>95%		

Case				
SDG	100923-110			
Lab Sample Number(s)	2129709			
Sampled Date	20-Sep-2010			
Customer Sample Ref.	WS3			
Depth (m)	1.20 - 1.50			

Solid Waste Analysis

Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	<0.01	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**Conc^n in 2:1 eluate (mg/l) C_2**		**2:1 conc^n leached (mg/kg) $A2_2$**		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Bis(2-chloroethyl)ether	<0.001	<0.001	<0.002	<0.01	-	-	-
Bis(2-ethylhexyl) phthalate	<0.002	<0.002	<0.004	<0.02	-	-	-
Boron	0.0689	<0.0094	0.138	<0.094	-	-	-
Bromobenzene	<0.002	<0.002	<0.004	<0.02	-	-	-
Bromochloromethane	<0.0019	<0.0019	<0.0038	<0.019	-	-	-
Bromodichloromethane	<0.0009	<0.0009	<0.0018	<0.009	-	-	-
Bromoform	<0.003	<0.003	<0.006	<0.03	-	-	-
Bromomethane	<0.002	<0.002	<0.004	<0.02	-	-	-
Butylbenzyl phthalate	<0.001	<0.001	<0.002	<0.01	-	-	-
Carbazole	<0.001	<0.001	<0.002	<0.01	-	-	-
Carbon Disulphide	<0.0013	<0.0013	<0.0026	<0.013	-	-	-
Carbontetrachloride	<0.0014	<0.0014	<0.0028	<0.014	-	-	-
Chlorobenzene	<0.0035	<0.0035	<0.007	<0.035	-	-	-
Chloroethane	<0.0025	<0.0025	<0.005	<0.025	-	-	-
Chloroform	<0.0018	<0.0018	<0.0036	<0.018	-	-	-
Chloromethane	<0.009	<0.009	<0.018	<0.09	-	-	-
Chrysene	<0.001	<0.001	<0.002	<0.01	-	-	-
Cis-1,2-Dichloroethene	<0.0023	<0.0023	<0.0046	<0.023	-	-	-
Cis-1,3-Dichloropropene	<0.0019	<0.0019	<0.0038	<0.019	-	-	-

Leach Test Information

Date Prepared	11-Oct-2010
pH (pH Units)	6.79
Conductivity (µS/cm)	99.70
Temperature (°C)	21.80
Volume Leachant (Litres)	0.328
Volume of Eluate VE1 (Litres)	

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Case				
SDG	100923-110			
Lab Sample Number(s)	2129709			
Sampled Date	20-Sep-2010			
Customer Sample Ref.	WS3			
Depth (m)	1.20 - 1.50			

Solid Waste Analysis

Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	<0.01	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**Conc^n in 2:1 eluate (mg/l) C_2**		**2:1 conc^n leached (mg/kg) $A2_2$**		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Dibenzo(a,h)anthracene	<0.001	<0.001	<0.002	<0.01	-	-	-
Dibenzofuran	<0.001	<0.001	<0.002	<0.01	-	-	-
Dibromochloromethane	<0.0017	<0.0017	<0.0034	<0.017	-	-	-
Dibromofluoromethane	-	-	-	-	-	-	-
Dibromomethane	<0.0027	<0.0027	<0.0054	<0.027	-	-	-
Dichlorodifluoromethane	<0.007	<0.007	<0.014	<0.07	-	-	-
Dichloromethane	<0.0037	<0.0037	<0.0074	<0.037	-	-	-
Diethyl phthalate	<0.001	<0.001	<0.002	<0.01	-	-	-
Dimethyl phthalate	<0.001	<0.001	<0.002	<0.01	-	-	-
Di-n-butyl phthalate	<0.001	<0.001	<0.002	<0.01	-	-	-
Di-n-Octyl phthalate	<0.005	<0.005	<0.01	<0.05	-	-	-
Ethylbenzene	<0.0025	<0.0025	<0.005	<0.025	-	-	-
Fluoranthene	<0.001	<0.001	<0.002	<0.01	-	-	-
Fluorene	<0.001	<0.001	<0.002	<0.01	-	-	-
Hexachlorobenzene	<0.001	<0.001	<0.002	<0.01	-	-	-
Hexachlorobutadiene	<0.0025	<0.0025	<0.005	<0.025	-	-	-
Hexachlorocyclopentadiene	<0.001	<0.001	<0.002	<0.01	-	-	-
Hexachloroethane	<0.001	<0.001	<0.002	<0.01	-	-	-
Indeno (1,2,3-cd) Pyrene	<0.001	<0.001	<0.002	<0.01	-	-	-

Leach Test Information

Date Prepared	11-Oct-2010
pH (pH Units)	6.79
Conductivity (µS/cm)	99.70
Temperature (°C)	21.80
Volume Leachant (Litres)	0.328
Volume of Eluate VE1 (Litres)	

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Mass Sample taken (kg)	0.197	**Moisture Content Ratio (%)**	12.4
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Case				
SDG	100923-110			
Lab Sample Number(s)	2129709			
Sampled Date	20-Sep-2010			
Customer Sample Ref.	WS3			
Depth (m)	1.20 - 1.50			

Solid Waste Analysis

Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	<0.01	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**Conc^{n} in 2:1 eluate (mg/l) C_2**		**2:1 conc^{n} leached (mg/kg) $A2_2$**		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Isophorone	<0.001	<0.001	<0.002	<0.01	-	-	-
Isopropylbenzene	<0.0014	<0.0014	<0.0028	<0.014	-	-	-
Naphthalene	<0.0035	<0.0035	<0.007	<0.035	-	-	-
n-Butylbenzene	<0.002	<0.002	<0.004	<0.02	-	-	-
Nitrobenzene	<0.001	<0.001	<0.002	<0.01	-	-	-
N-nitrosodi-n-propylamine	<0.001	<0.001	<0.002	<0.01	-	-	-
o-Xylene	<0.0017	<0.0017	<0.0034	<0.017	-	-	-
p/m-Xylene	<0.0025	<0.0025	<0.005	<0.025	-	-	-
Pentachlorophenol	<0.001	<0.001	<0.002	<0.01	-	-	-
Phenanthrene	<0.001	<0.001	<0.002	<0.01	-	-	-
Phenol	<0.001	<0.001	<0.002	<0.01	-	-	-
Propylbenzene	<0.0026	<0.0026	<0.0052	<0.026	-	-	-
Pyrene	<0.001	<0.001	<0.002	<0.01	-	-	-
Sec-Butylbenzene	<0.0017	<0.0017	<0.0034	<0.017	-	-	-
Styrene	<0.0012	<0.0012	<0.0024	<0.012	-	-	-
Tert-amyl methyl ether	<0.001	<0.001	<0.002	<0.01	-	-	-
Tert-butyl methyl ether	<0.0016	<0.0016	<0.0032	<0.016	-	-	-
Tert-Butylbenzene	<0.002	<0.002	<0.004	<0.02	-	-	-
Tetrachloroethene	<0.0015	<0.0015	<0.003	<0.015	-	-	-

Leach Test Information

Date Prepared	11-Oct-2010
pH (pH Units)	6.79
Conductivity (µS/cm)	99.70
Temperature (°C)	21.80
Volume Leachant (Litres)	0.328
Volume of Eluate VE1 (Litres)	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable

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CEN 2:1 ONE STAGE BATCH TEST

REF-CEN12457-3

Client Reference		**Client Location**	Stagborough
Mass Sample taken (kg)	0.197	**Moisture Content Ratio (%)**	12.4
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	89.0
Particle Size <4mm	>95%		

Case				
SDG	100923-110			
Lab Sample Number(s)	2129709			
Sampled Date	20-Sep-2010			
Customer Sample Ref.	WS3			
Depth (m)	1.20 - 1.50			

Solid Waste Analysis

Total Organic Carbon (%)	-	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	<0.01	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**Conc^{n} in 2:1 eluate (mg/l) C_2**		**2:1 conc^{n} leached (mg/kg) $A2_2$**		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Toluene	<0.0014	<0.0014	<0.0028	<0.014	-	-	-
Toluene-d8	-	-	-	-	-	-	-
TPH	<1	<1	<2	<1	-	-	-
Trans-1,2-Dichloroethene	<0.0019	<0.0019	<0.0038	<0.019	-	-	-
Trans-1,3-Dichloropropene	<0.0035	<0.0035	<0.007	<0.035	-	-	-
Trichloroethene	<0.0025	<0.0025	<0.005	<0.025	-	-	-
Trichlorofluoromethane	<0.0013	<0.0013	<0.0026	<0.013	-	-	-
Vanadium	0.000312	<0.00024	0.000624	<0.0024	-	-	-
Vinyl Chloride	<0.0012	<0.0012	<0.0024	<0.012	-	-	-

Leach Test Information

Date Prepared	11-Oct-2010
pH (pH Units)	6.79
Conductivity (µS/cm)	99.70
Temperature (°C)	21.80
Volume Leachant (Litres)	0.328
Volume of Eluate VE1 (Litres)	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable

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Mcerts Certification does not apply to leachates

Table of Results - Appendix

SDG Number : 100923-110 **Client :** H_GRONTMIJ_SOL **Client Ref :**

REPORT KEY

Results expressed as (e.g.) 1.03E-07 is equivalent to 1.03x10-7

NDP	No Determination Possible	#	ISO 17025 Accredited	*	Subcontracted Test	M	MCERTS Accredited
NFD	No Fibres Detected	PFD	Possible Fibres Detected	»	Result previously reported (Incremental reports only)	EC	Equivalent Carbon (Aromatics C8-C35)

Note: Method detection limits are not always achievable due to various circumstances beyond our control

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
PM001		Preparation of Samples for Metals Analysis		
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material		
PM114		Leaching Procedure for CEN Two Stage BatchTest 2:1/8:1 Cumulative		
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step		
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step		
TM001	In - house Method	Determination of asbestos containing material by screening on solids		
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)		
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS		
TM132	In - house Method	ELTRA CS800 Operators Guide		
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter		
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the 'Skalar SANS+ System' Segmented Flow Analyser		
TM157	HP 6890 Gas Chromatograph (GC) system and HP 5973 Mass Selective Detector (MSD).	Determination of SVOC in Soils by GC-MS extracted by sonication in DCM/Acetone		
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID		
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS		
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters		
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer		
TM235	The Determination of Hydrocarbon Oils in Waters by Solvent Extraction, Infra red Absorption and Gravimetry 1983, HMSO, London	Determination of Total Petroleum Hydrocarbons (TPH) in Waters By Infra-Red Spectroscopy		

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

Notification of Non-Conforming Work

SDG Number 100923-110
Client H_GRONTMIJ_SOL
Client Reference
Attention Gareth Taylor

Location Stagborough
Order No.
Report No. 100345
Date Received 23/09/2010 18:37:52

Sample Number	Customer Sample Ref.	Depth (m)	Matrix	Test Name	Component Name	Comment
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	Aliphatics >C10-C12	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	Aliphatics >C10-C12 raw	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	Aliphatics >C5-C6	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	Aliphatics >C5-C6 raw	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	Aliphatics >C6-C8	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	Aliphatics >C6-C8 raw	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	Aliphatics >C8-C10	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	Aliphatics >C8-C10 raw	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	Aromatics >EC10-EC12	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	Aromatics >EC10-EC12 raw	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	Aromatics >EC5-EC7	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	Aromatics >EC6-EC7 raw	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	Aromatics >EC7-EC8	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	Aromatics >EC7-EC8 raw	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	Aromatics >EC8 -EC10 raw	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	Aromatics >EC8-EC10	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	Benzene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	Benzene Uncorrected	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	BTEX, Total	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	Ethylbenzene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	Ethylbenzene Uncorrected	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	GRO >C10-C12	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	GRO >C5-C10	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	GRO >C5-C12	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	GRO >C5-C6	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	GRO >C6-C7	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	GRO >C6-C8	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	GRO >C7-C8	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	GRO >C8-C10	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	GRO Surrogate % recovery**	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	GRO TOT (C5-C12) Uncorrected	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	GRO_bandC (>C10-C12) raw	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	GRO_bandC (>C5-C6) raw	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	GRO_bandC (>C6-C7) raw	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	GRO_bandC (>C7-C8) raw	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	GRO_bandC (>C8-C10) raw	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	m & p Xylene Uncorrected	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	m,p,o-Xylene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	m,p-Xylene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	Methyl tertiary butyl ether (MTBE)	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	MTBE Uncorrected	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	o Xylene Uncorrected	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	o-Xylene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	TAME Uncorrected	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	tert-Amyl methyl ether (TAME)	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	Toluene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	Toluene Uncorrected	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	Total Aliphatics >C5-C12	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	Total Aliphatics C5-C12 raw	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	Total Aromatics >EC5-EC12	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	GRO by GC-FID (S)	Total Aromatics >EC6-EC12 raw	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	1,1,2-Trichloro-1,2,2-Trifluoroethane (TIC)	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	1.1.1.2-Tetrachloroethane	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	1.1.1-Trichloroethane	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	1.1.2.2-Tetrachloroethane	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	1.1.2-Trichloroethane	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	1.1-Dichloroethane	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	1.1-Dichloroethene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	1.1-Dichloropropene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	1.2.3-Trichlorobenzene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	1.2.3-Trichloropropane	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	1.2.4-Trichlorobenzene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	1.2.4-Trimethylbenzene	Volatile container not received

Sample Number	Customer Sample Ref.	Depth (m)	Matrix	Test Name	Component Name	Comment
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	1.2-Dibromo-3-chloropropane	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	1.2-Dibromoethane	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	1.2-Dichlorobenzene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	1.2-Dichloroethane	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	1.2-Dichloropropane	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	1.3.5-Trimethylbenzene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	1.3-Dichlorobenzene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	1.3-Dichloropropane	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	1.4-Dichlorobenzene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	2.2-Dichloropropane	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	2-Chlorotoluene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	4-Bromofluorobenzene**	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	4-Chlorotoluene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	4-Isopropyltoluene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Benzene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Bromobenzene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Bromochloromethane	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Bromodichloromethane	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Bromoform	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Bromomethane	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Carbon disulphide	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Carbontetrachloride	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Chlorobenzene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Chloroethane	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Chloroform	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Chloromethane	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Chorobenzene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	cis-1-2-Dichloroethene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	cis-1-3-Dichloropropene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Dibromochloromethane	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Dibromofluoromethane**	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Dibromomethane	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Dichlorodifluoromethane	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Dichloromethane	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Dilution	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Ethylbenzene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Hexachlorobutadiene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Isopropylbenzene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	LCS Reagent	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Methyl Tertiary Butyl Ether	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Naphthalene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	n-Butylbenzene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	o-Xylene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	p/m-Xylene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Propylbenzene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	sec-Butylbenzene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Styrene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Tert-amyl methyl ether	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	tert-Butylbenzene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Tetrachloroethene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	TIC Instructions	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Toluene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Toluene-d8**	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	trans-1-2-Dichloroethene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	trans-1-3-Dichloropropene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Trichloroethene	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Trichlorofluoromethane	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Trichlorofluorormethane	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	Vinyl Chloride	Volatile container not received
2129704	WS3	1.20 - 1.50	SOLID	VOC MS (S)	VOC TIC	Volatile container not received

APPENDIX

APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH_4 by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. Results relate only to the items tested
13. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 – 130 %.
14. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).
16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
18. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
19. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKE	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM	LIQUID/LIQUID SHAKE	GC MS
TRIAZINE HERBS	DCM	LIQUID/LIQUID SHAKE	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	NONE	DIRECT INJECTION	GC FID

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

ALcontrol Laboratories

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Radcliffe House
3rd Floor
Blenheim Court, Lode lane
Solihull
West Midlands
B912AA

Attention: Gareth Taylor

CERTIFICATE OF ANALYSIS

Date:	15 October 2010		
Customer:	H_GRONTMIJ_SOL-27		
Sample Delivery Group (SDG):	101006-33	**Report No.:**	100215
Your Reference:			
Location:	Stagborough		

We received 29 samples on Wednesday October 06, 2010 and 12 of these samples were scheduled for analysis which was completed on Friday October 15, 2010. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Iain Swinton

Operations Director - Land UK & Ireland

1291
GROUP

Validated

ALcontrol Laboratories Analytical Services

SDG:	101006-33	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100215

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
2192932	HP10			04/10/2010
2193052	HP10		0.30	04/10/2010
2193080	HP10		0.60	04/10/2010
2193172	HP11			04/10/2010
2192937	HP11		0.35	04/10/2010
2193098	HP11		0.65	04/10/2010
2192820	HP2		0.05	03/10/2010
2192875	HP2		0.30	03/10/2010
2193102	HP2		0.65	03/10/2010
2192975	HP3			03/10/2010
2192968	HP3		0.30	03/10/2010
2192894	HP3		0.65	03/10/2010
2192813	HP4			03/10/2010
2192862	HP4		0.30	03/10/2010
2192922	HP4		0.35	03/10/2010
2192746	HP4		0.65	03/10/2010
2192833	HP6			03/10/2010
2192827	HP6		0.30	03/10/2010
2193002	HP6		0.65	03/10/2010
2192800	HP7			03/10/2010
2192899	HP7		0.30	03/10/2010
2192768	HP7		0.60	03/10/2010
2192914	HP8			03/10/2010
2192841	HP8		0.30	03/10/2010
2192759	HP8		0.65	03/10/2010
2193148	HP9			04/10/2010
2193068	HP9		0.30	04/10/2010
2192906	HP9		0.65	04/10/2010
2193020	NO ID			

Only received samples which have had analysis scheduled will be shown on the following pages.

Validated

ALcontrol Laboratories Analytical Services

SDG:	101006-33	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100215

SOLID

Results Legend

X Test

N No Determination Possible

			Lab Sample No(s)	2192768	2192813	2192827	2192862	2192875	2192906	2192914	2192937	2192975	2193052	2193068	2193172
			Customer Sample Ref.	HP7	HP4	HP6	HP4	HP2	HP9	HP8	HP11	HP3	HP10	HP9	HP11
			AGS Ref.												
			Depth (m)	0.60		0.30	0.30	0.30	0.65		0.35		0.30	0.30	
			Container	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	1kg TUB	250g Amber Jar	60g VOC	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	1kg TUB	250g Amber Jar	1kg TUB	250g Amber Jar	250g Amber Jar	400g Tub
Asbestos Containing Material Screen	All	NDPs: 0 Tests: 1								X													
Boron Water Soluble	All	NDPs: 0 Tests: 12		X	X	X	X	X		X		X	X	X	X	X		X		X	X	X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1								X													
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0 Tests: 1										X											
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 1										X											
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1											X										
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 12		X		X		X		X	X		X		X		X	X		X			X
Metals by iCap-OES (Soil)	Antimony	NDPs: 0 Tests: 1								X													
	Arsenic	NDPs: 0 Tests: 12		X	X	X	X	X		X		X	X	X	X	X		X		X	X	X	
	Barium	NDPs: 0 Tests: 12		X	X	X	X	X		X		X	X	X	X	X		X		X	X	X	
	Beryllium	NDPs: 0 Tests: 12		X	X	X	X	X		X		X	X	X	X	X		X		X	X	X	
	Cadmium	NDPs: 0 Tests: 12		X	X	X	X	X		X		X	X	X	X	X		X		X	X	X	
	Chromium	NDPs: 0 Tests: 12		X	X	X	X	X		X		X	X	X	X	X		X		X	X	X	
	Copper	NDPs: 0 Tests: 12		X	X	X	X	X		X		X	X	X	X	X		X		X	X	X	
	Lead	NDPs: 0 Tests: 12		X	X	X	X	X		X		X	X	X	X	X		X		X	X	X	
	Mercury	NDPs: 0 Tests: 12		X	X	X	X	X		X		X	X	X	X	X		X		X	X	X	

Validated

ALcontrol Laboratories Analytical Services

SDG:	101006-33	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100215

SOLID

Results Legend

X Test

N No Determination Possible

			Lab Sample No(s)	2192768	2192813	2192827	2192862	2192875	2192906	2192914	2192937	2192975	2193052	2193068	2193172
			Customer Sample Ref.	HP7	HP4	HP6	HP4	HP2	HP9	HP8	HP11	HP3	HP10	HP9	HP11
			AGS Ref.												
			Depth (m)	0.60		0.30	0.30	0.30	0.65		0.35		0.30	0.30	
			Container	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	1kg TUB	250g Amber Jar	60g VOC	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	1kg TUB	250g Amber Jar	1kg TUB	250g Amber Jar	250g Amber Jar	400g Tub
Metals by iCap-OES (Soil)	Nickel	NDPs: 0 Tests: 12		X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Selenium	NDPs: 0 Tests: 12		X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Vanadium	NDPs: 0 Tests: 12		X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Zinc	NDPs: 0 Tests: 12		X	X	X	X	X	X	X	X	X	X	X	X	X	X
pH	All	NDPs: 0 Tests: 12		X		X		X		X		X		X	X	X		X		X		X		X	X	X		X
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1									X																			
Sample description	All	NDPs: 0 Tests: 12		X	X	X	X	X	X	X	X	X	X	X	X	X	X
Semi Volatile Organic Compounds	All	NDPs: 0 Tests: 1								X																				
Total Organic Carbon	All	NDPs: 0 Tests: 12		X	X	X	X	X	X	X	X	X	X	X	X	X	X
TPH CWG GC (S)	All	NDPs: 0 Tests: 1								X																				
VOC MS (S)	All	NDPs: 0 Tests: 1									X																			

Validated

ALcontrol Laboratories Analytical Services

SDG:	101006-33	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100215

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Grain size	Inclusions	Inclusions 2
2192768	HP7	0.60	Dark Brown	Sandy Loam	0.1 - 2 mm	Stones	N/A
2192813	HP4		Dark Brown	Sandy Clay	0.1 - 2 mm	Stones	Vegetation
2192827	HP6	0.30	Dark Brown	Sandy Clay	0.1 - 2 mm	Stones	N/A
2192862	HP4	0.30	Dark Brown	Sand	0.1 - 2 mm	Stones	N/A
2192875	HP2	0.30	Dark Brown	Sand	0.1 - 2 mm	Stones	N/A
2192906	HP9	0.65	Light Brown	Clay Loam	0.063 - 0.1 mm	Stones	None
2192914	HP8		Dark Brown	Sand	0.1 - 2 mm	Stones	N/A
2192937	HP11	0.35	Dark Brown	Sand	0.1 - 2 mm	Stones	N/A
2192975	HP3		Dark Brown	Sandy Clay	0.1 - 2 mm	Stones	Vegetation
2193052	HP10	0.30	Dark Brown	Sandy Clay	0.1 - 2 mm	Stones	Vegetation
2193068	HP9	0.30	Grey	Sandy Clay	0.1 - 2 mm	Stones	N/A
2193172	HP11		Dark Brown	Loamy Sand	0.1 - 2 mm	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Validated

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Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100216

Test Completion Dates

Lab Sample No(s)	2192768	2192813	2192827	2192862	2192875	2192906	2192914	2192937	2192975	2193052
Customer Sample Ref.	HP7	HP4	HP6	HP4	HP2	HP9	HP8	HP11	HP3	HP10
AGS Ref.										
Depth	0.60		0.30	0.30	0.30	0.65		0.35		0.30
Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Asbestos Containing Material Screen						11/10/2010				
Boron Water Soluble	12/10/2010	12/10/2010	12/10/2010	12/10/2010	12/10/2010	13/10/2010	12/10/2010	12/10/2010	12/10/2010	12/10/2010
Cyanide Comp/Free/Total/Thiocyanate						12/10/2010				
EPH CWG (Aliphatic) GC (S)						13/10/2010				
EPH CWG (Aromatic) GC (S)						13/10/2010				
GRO by GC-FID (S)						14/10/2010				
Hexavalent Chromium (s)	11/10/2010	11/10/2010	11/10/2010	11/10/2010	11/10/2010	13/10/2010	11/10/2010	11/10/2010	11/10/2010	13/10/2010
Metals by iCap-OES (Soil)	12/10/2010	12/10/2010	13/10/2010	12/10/2010	12/10/2010	14/10/2010	12/10/2010	12/10/2010	13/10/2010	12/10/2010
pH	12/10/2010	12/10/2010	12/10/2010	12/10/2010	12/10/2010	11/10/2010	12/10/2010	12/10/2010	12/10/2010	11/10/2010
Phenols by HPLC (S)						12/10/2010				
Sample description	08/10/2010	08/10/2010	08/10/2010	08/10/2010	08/10/2010	11/10/2010	08/10/2010	08/10/2010	08/10/2010	08/10/2010
Semi Volatile Organic Compounds						13/10/2010				
Total Organic Carbon	12/10/2010	12/10/2010	12/10/2010	12/10/2010	12/10/2010	13/10/2010	12/10/2010	12/10/2010	12/10/2010	12/10/2010
TPH CWG GC (S)						14/10/2010				
VOC MS (S)						15/10/2010				

Lab Sample No(s)	2193068	2193172
Customer Sample Ref.	HP9	HP11
AGS Ref.		
Depth	0.30	
Type	SOLID	SOLID
Boron Water Soluble	12/10/2010	12/10/2010
Hexavalent Chromium (s)	13/10/2010	11/10/2010
Metals by iCap-OES (Soil)	13/10/2010	13/10/2010
pH	11/10/2010	12/10/2010
Sample description	08/10/2010	08/10/2010
Total Organic Carbon	12/10/2010	12/10/2010

Validated

ALcontrol Laboratories Analytical Services

SDG:	101006-33	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100216

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	HP10	HP11	HP11	HP2	HP3	HP4
			Depth (m)	0.30		0.35	0.30		
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	04/10/2010	04/10/2010	04/10/2010	03/10/2010	03/10/2010	03/10/2010
			Date Received	06/10/2010	06/10/2010	06/10/2010	06/10/2010	06/10/2010	06/10/2010
			SDG Ref	101006-33	101006-33	101006-33	101006-33	101006-33	101006-33
			Lab Sample No.(s)	2193052	2193172	2192937	2192875	2192975	2192813
			AGS Reference						
Soil Organic Matter (SOM)	<0.35 %	TM132		5.41 #	8.38 #	4.84 #	1.55 #	5.64 #	7.12 #
pH	1 pH Units	TM133		7.68 M	7.24 M	7.25 M	7.77 M	5.86 M	7.11 M
Chromium, Hexavalent	<0.6 mg/kg	TM151		<0.6 #	<0.6 #	<0.6 #	<0.6 #	<0.6 #	<0.6 #
Arsenic	<0.6 mg/kg	TM181		11.2 M	11.4 M	10.7 M	5.18 M	9.92 M	10.8 M
Barium	<0.6 mg/kg	TM181		206 #	109 #	140 #	105 #	99.9 #	177 #
Beryllium	<0.01 mg/kg	TM181		1.21	1.08	1.07	0.663	1.21	1.83
Cadmium	<0.02 mg/kg	TM181		0.994 M	0.852 M	0.784 M	0.485 M	0.64 M	1.13 M
Chromium	<0.9 mg/kg	TM181		32 M	16.3 M	16.6 M	13.1 M	19.9 M	21.8 M
Copper	<1.4 mg/kg	TM181		31.2 M	76.6 M	35.9 M	15.5 M	31.2 M	158 M
Lead	<0.7 mg/kg	TM181		37.9 M	89 M	57.4 M	19.2 M	52.1 M	134 M
Mercury	<0.14 mg/kg	TM181		0.37 M	0.308 M	0.469 M	0.456 M	0.19 M	0.215 M
Nickel	<0.2 mg/kg	TM181		28.9 M	24.2 M	21.8 M	13.2 M	23 M	32.1 M
Selenium	<1 mg/kg	TM181		1.39 #	1.42 #	1.04 #	<1 #	1.09 #	1.15 #
Vanadium	<0.2 mg/kg	TM181		26.7 #	22.6 #	23.4 #	17.1 #	24.5 #	27.4 #
Zinc	<1.9 mg/kg	TM181		167 M	218 M	153 M	54.1 M	136 M	242 M
Boron, water soluble	<1 mg/kg	TM222		<1 M	1.36 M	<1 M	<1 M	<1 M	<1 M

Validated

ALcontrol Laboratories Analytical Services

SDG: 101006-33
Job: H_GRONTMIJ_SOL-27
Client Reference:
Location: Stagborough

Customer: Grontmij
Attention: Gareth Taylor
Order No.:
Report No: 100216

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	HP4	HP6	HP7	HP8	HP9	HP9
			Depth (m)	0.30	0.30	0.60		0.30	0.65
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	03/10/2010	03/10/2010	03/10/2010	03/10/2010	04/10/2010	04/10/2010
			Date Received	06/10/2010	06/10/2010	06/10/2010	06/10/2010	06/10/2010	06/10/2010
			SDG Ref	101006-33	101006-33	101006-33	101006-33	101006-33	101006-33
			Lab Sample No.(s)	2192862	2192827	2192768	2192914	2193068	2192906
			AGS Reference						
Asbestos Containing Material Screen	-	TM001							No ACM Detected
Phenols, Total monohydric	<0.025 mg/kg	TM062 (S)							<0.025 M
Soil Organic Matter (SOM)	<0.35 %	TM132		1.5 #	3.28 #	6.02 #	1.84 #	7.79 #	7.05 #
pH	1 pH Units	TM133		7.39 M	8.15 M	6.72 M	6.73 M	7.01 M	7.56 M
Chromium, Hexavalent	<0.6 mg/kg	TM151		<0.6 #	<0.6 #	<0.6 #	<0.6 #	<0.6 #	<0.6 #
Cyanide, Total	<1 mg/kg	TM153							<1 M
Thiocyanate	<1 mg/kg	TM153							<1 M
Antimony	<0.6 mg/kg	TM181							<0.6 #
Arsenic	<0.6 mg/kg	TM181		5.91 M	6.9 M	9.73 M	25.1 M	9.84 M	12.2 M
Barium	<0.6 mg/kg	TM181		53.3 #	130 #	141 #	75.2 #	116 #	119 #
Beryllium	<0.01 mg/kg	TM181		0.574	0.94	1.73	0.792	1.47	2.47 M
Cadmium	<0.02 mg/kg	TM181		0.361 M	0.572 M	1.4 M	0.562 M	1.03 M	0.912 M
Chromium	<0.9 mg/kg	TM181		15.4 M	15 M	20.6 M	14.1 M	17.2 M	24.3 M
Copper	<1.4 mg/kg	TM181		14.5 M	21.4 M	41 M	15.2 M	38.3 M	41.1 M
Lead	<0.7 mg/kg	TM181		19.2 M	28.6 M	49.9 M	25 M	43.7 M	48.6 M
Mercury	<0.14 mg/kg	TM181		0.484 M	<0.14 M	0.215 M	0.496 M	0.231 M	<0.14 M
Nickel	<0.2 mg/kg	TM181		13.2 M	22.6 M	42.9 M	14.2 M	41.2 M	47.9 M
Selenium	<1 mg/kg	TM181		<1 #	<1 #	1.84 #	<1 #	1.12 #	1.06 #
Vanadium	<0.2 mg/kg	TM181		19.2 #	20.1 #	28.3 #	18.4 #	22.1 #	36.9 #
Zinc	<1.9 mg/kg	TM181		46.8 M	89.6 M	284 M	66 M	214 M	279 M
Boron, water soluble	<1 mg/kg	TM222		<1 M	1.14 M	2.56 M	<1 M	2.6 M	3.85 M

SDG:	101006-33	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
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Location:	Stagborough	**Report No:**	100216

Semi Volatile Organic Compounds

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	HP9
			Depth (m)	0.65
			Sample Type	Soil/Solid
			Date Sampled	04/10/2010
			Date Received	06/10/2010
			SDG Ref	101006-33
			Lab Sample No.(s)	2192906
			AGS Reference	
Phenol	<100 µg/kg	TM157		<100
Pentachlorophenol	<100 µg/kg	TM157		<100
n-Nitroso-n-dipropylamine	<100 µg/kg	TM157		<100
Nitrobenzene	<100 µg/kg	TM157		<100
Isophorone	<100 µg/kg	TM157		<100
Hexachloroethane	<100 µg/kg	TM157		<100
Hexachlorocyclopentadiene	<100 µg/kg	TM157		<100
Hexachlorobutadiene	<100 µg/kg	TM157		<100
Hexachlorobenzene	<100 µg/kg	TM157		<100
n-Dioctyl phthalate	<100 µg/kg	TM157		<100
Dimethyl phthalate	<100 µg/kg	TM157		<100
Diethyl phthalate	<100 µg/kg	TM157		<100
n-Dibutyl phthalate	<100 µg/kg	TM157		<100
Dibenzofuran	<100 µg/kg	TM157		197
Carbazole	<100 µg/kg	TM157		<100
Butylbenzyl phthalate	<100 µg/kg	TM157		<100
bis(2-Ethylhexyl) phthalate	<100 µg/kg	TM157		<100
bis(2-Chloroethoxy)methane	<100 µg/kg	TM157		<100
bis(2-Chloroethyl)ether	<100 µg/kg	TM157		<100
Azobenzene	<100 µg/kg	TM157		<100
4-Nitrophenol	<100 µg/kg	TM157		<100
4-Nitroaniline	<100 µg/kg	TM157		<100
4-Methylphenol	<100 µg/kg	TM157		<100
4-Chlorophenylphenylether	<100 µg/kg	TM157		<100
4-Chloroaniline	<100 µg/kg	TM157		<100
4-Chloro-3-methylphenol	<100 µg/kg	TM157		<100
4-Bromophenylphenylether	<100 µg/kg	TM157		<100
3-Nitroaniline	<100 µg/kg	TM157		<100
2-Nitrophenol	<100 µg/kg	TM157		<100
2-Nitroaniline	<100 µg/kg	TM157		<100
2-Methylphenol	<100 µg/kg	TM157		<100
1,2,4-Trichlorobenzene	<100 µg/kg	TM157		<100
2-Chlorophenol	<100 µg/kg	TM157		<100
2,6-Dinitrotoluene	<100 µg/kg	TM157		<100
2,4-Dinitrotoluene	<100 µg/kg	TM157		<100
2,4-Dimethylphenol	<100 µg/kg	TM157		<100
2,4-Dichlorophenol	<100 µg/kg	TM157		<100
2,4,6-Trichlorophenol	<100 µg/kg	TM157		<100
2,4,5-Trichlorophenol	<100 µg/kg	TM157		<100

Validated

ALcontrol Laboratories Analytical Services

SDG:	101006-33	**Customer:**	Grontmij
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Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100216

Semi Volatile Organic Compounds

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref.	HP9
			Depth (m)	0.65
			Sample Type	Soil/Solid
			Date Sampled	04/10/2010
			Date Received	06/10/2010
			SDG Ref	101006-33
			Lab Sample No.(s)	2192906
			AGS Reference	
1,4-Dichlorobenzene	<100 µg/kg	TM157		<100
1,3-Dichlorobenzene	<100 µg/kg	TM157		<100
1,2-Dichlorobenzene	<100 µg/kg	TM157		<100
2-Chloronaphthalene	<100 µg/kg	TM157		<100
2-Methylnaphthalene	<100 µg/kg	TM157		562
Acenaphthylene	<100 µg/kg	TM157		<100
Acenaphthene	<100 µg/kg	TM157		<100
Anthracene	<100 µg/kg	TM157		<100
Benzo(a)anthracene	<100 µg/kg	TM157		236
Benzo(b)fluoranthene	<100 µg/kg	TM157		228
Benzo(k)fluoranthene	<100 µg/kg	TM157		129
Benzo(a)pyrene	<100 µg/kg	TM157		167
Benzo(g,h,i)perylene	<100 µg/kg	TM157		175
Chrysene	<100 µg/kg	TM157		338
Fluoranthene	<100 µg/kg	TM157		506
Fluorene	<100 µg/kg	TM157		<100
Indeno(1,2,3-cd)pyrene	<100 µg/kg	TM157		<100
Phenanthrene	<100 µg/kg	TM157		862
Pyrene	<100 µg/kg	TM157		431
Naphthalene	<100 µg/kg	TM157		301
Dibenzo(a,h)anthracene	<100 µg/kg	TM157		<100

ALcontrol Laboratories Analytical Services

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Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100216

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref. HP9
			Depth (m) 0.65
			Sample Type Soil/Solid
			Date Sampled 04/10/2010
			Date Received 06/10/2010
			SDG Ref 101006-33
			Lab Sample No.(s) 2192906
			AGS Reference
Aliphatics >C12-C16	<100 µg/kg	TM173	18700
Aliphatics >C16-C21	<100 µg/kg	TM173	12600
Aliphatics >C21-C35	<100 µg/kg	TM173	23900
Aliphatics >C35-C44	<100 µg/kg	TM173	2280
Aromatics >EC12-EC16	<100 µg/kg	TM173	16500
Aromatics >EC16-EC21	<100 µg/kg	TM173	36300
Aromatics >EC21-EC35	<100 µg/kg	TM173	92600
Aromatics >EC35-EC44	<100 µg/kg	TM173	20900
Aromatics >EC40-EC44	<100 µg/kg	TM173	6020
Total Aliphatics >C12-C44	<100 µg/kg	TM173	57500
Total Aromatics >EC12-EC44	<100 µg/kg	TM173	166000
Total Aliphatics >C5-35	<100 µg/kg	TM173	55200
Total Aliphatics >C5-C44	<100 µg/kg	TM173	57500
Total Aromatics >C5-35	<100 µg/kg	TM173	145000
Total Aromatics >C6-C44	<100 µg/kg	TM173	166000
Total Aliphatics & Aromatics >C5-35	<100 µg/kg	TM173	201000
Total Aliphatics & Aromatics >C5-C44	<100 µg/kg	TM173	224000
GRO Surrogate % recovery**	%	TM089	15
GRO >C5-C12	<44 µg/kg	TM089	<44
Methyl tertiary butyl ether (MTBE)	<5 µg/kg	TM089	<5 #
Benzene	<10 µg/kg	TM089	<10 M
Toluene	<2 µg/kg	TM089	6.72 M
Ethylbenzene	<3 µg/kg	TM089	12.3 M
m,p-Xylene	<6 µg/kg	TM089	<6 M
o-Xylene	<3 µg/kg	TM089	<3 M
Aliphatics >C5-C6	<10 µg/kg	TM089	<10
Aliphatics >C6-C8	<10 µg/kg	TM089	<10
Aliphatics >C8-C10	<10 µg/kg	TM089	<10
Aliphatics >C10-C12	<10 µg/kg	TM089	<10
Total Aliphatics >C5-C12	<10 µg/kg	TM089	<10
Aromatics >EC5-EC7	<10 µg/kg	TM089	<10
Aromatics >EC7-EC8	<10 µg/kg	TM089	<10
Aromatics >EC8-EC10	<10 µg/kg	TM089	13.4
Aromatics >EC10-EC12	<10 µg/kg	TM089	<10
Total Aromatics >EC5-EC12	<10 µg/kg	TM089	23.5
m,p,o-Xylene	<10 µg/kg	TM089	<10
BTEX, Total	<10 µg/kg	TM089	19

SDG:	101006-33	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100216

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample Ref. HP9
			Depth (m) 0.65
			Sample Type Soil/Solid
			Date Sampled 04/10/2010
			Date Received 06/10/2010
			SDG Ref 101006-33
			Lab Sample No.(s) 2192906
			AGS Reference
Dibromofluoromethane**	%	TM116	99.1
Toluene-d8**	%	TM116	78.4
4-Bromofluorobenzene**	%	TM116	154
Dichlorodifluoromethane	<4 µg/kg	TM116	<4 M
Chloromethane	<7 µg/kg	TM116	<7 #
Vinyl Chloride	<10 µg/kg	TM116	<10 #
Bromomethane	<13 µg/kg	TM116	<13 M
Chloroethane	<14 µg/kg	TM116	<14 M
Trichlorofluorormethane	<6 µg/kg	TM116	<6 M
1.1-Dichloroethene	<10 µg/kg	TM116	<10 #
Carbon Disulphide	<7 µg/kg	TM116	<7 M
Dichloromethane	<10 µg/kg	TM116	<10 #
Methyl Tertiary Butyl Ether	<11 µg/kg	TM116	<11 M
trans-1-2-Dichloroethene	<11 µg/kg	TM116	<11 M
1.1-Dichloroethane	<8 µg/kg	TM116	<8 M
cis-1-2-Dichloroethene	<5 µg/kg	TM116	<5 M
2.2-Dichloropropane	<12 µg/kg	TM116	<12 M
Bromochloromethane	<14 µg/kg	TM116	<14 M
Chloroform	<8 µg/kg	TM116	<8 M
1.1.1-Trichloroethane	<7 µg/kg	TM116	<7 M
1.1-Dichloropropene	<11 µg/kg	TM116	<11 M
Carbontetrachloride	<14 µg/kg	TM116	<14 M
1.2-Dichloroethane	<5 µg/kg	TM116	<5 M
Benzene	<9 µg/kg	TM116	21.5 M
Trichloroethene	<9 µg/kg	TM116	<9 M
1.2-Dichloropropane	<12 µg/kg	TM116	<12 M
Dibromomethane	<9 µg/kg	TM116	<9 M
Bromodichloromethane	<7 µg/kg	TM116	<7 M
cis-1-3-Dichloropropene	<14 µg/kg	TM116	<14 M
Toluene	<5 µg/kg	TM116	23.7 M
trans-1-3-Dichloropropene	<14 µg/kg	TM116	<14
1.1.2-Trichloroethane	<10 µg/kg	TM116	<10 M
1.3-Dichloropropane	<7 µg/kg	TM116	<7 #
Tetrachloroethene	<5 µg/kg	TM116	6.7 M
Dibromochloromethane	<13 µg/kg	TM116	<13 M
1.2-Dibromoethane	<12 µg/kg	TM116	<12 M
Chorobenzene	<5 µg/kg	TM116	<5 M
1.1.1.2-Tetrachloroethane	<10 µg/kg	TM116	<10 M
Ethylbenzene	<4 µg/kg	TM116	69.1 M

SDG:	101006-33	**Customer:**	Grontmij
Job:	H_GRONTMIJ_SOL-27	**Attention:**	Gareth Taylor
Client Reference:		**Order No.:**	
Location:	Stagborough	**Report No:**	100216

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.

Customer Sample Ref.	HP9
Depth (m)	0.65
Sample Type	Soil/Solid
Date Sampled	04/10/2010
Date Received	06/10/2010
SDG Ref	101006-33
Lab Sample No.(s)	2192906
AGS Reference	

Component	LOD/Units	Method	
p/m-Xylene	<14 µg/kg	TM116	<14 #
o-Xylene	<10 µg/kg	TM116	<10 M
Styrene	<10 µg/kg	TM116	<10 M
Bromoform	<10 µg/kg	TM116	<10 M
Isopropylbenzene	<5 µg/kg	TM116	<5 M
1.1.2.2-Tetrachloroethane	<10 µg/kg	TM116	<10 #
1.2.3-Trichloropropane	<17 µg/kg	TM116	<17 M
Bromobenzene	<10 µg/kg	TM116	<10 M
Propylbenzene	<11 µg/kg	TM116	<11 M
2-Chlorotoluene	<9 µg/kg	TM116	<9 M
1.3.5-Trimethylbenzene	<8 µg/kg	TM116	<8 #
4-Chlorotoluene	<12 µg/kg	TM116	<12 M
tert-Butylbenzene	<12 µg/kg	TM116	<12 #
1.2.4-Trimethylbenzene	<9 µg/kg	TM116	<9 #
sec-Butylbenzene	<10 µg/kg	TM116	<10 M
4-Isopropyltoluene	<11 µg/kg	TM116	<11 M
1.3-Dichlorobenzene	<6 µg/kg	TM116	<6 M
1.4-Dichlorobenzene	<5 µg/kg	TM116	<5 M
n-Butylbenzene	<10 µg/kg	TM116	<10 M
1.2-Dichlorobenzene	<12 µg/kg	TM116	<12 M
1.2-Dibromo-3-chloropropane	<14 µg/kg	TM116	<14 M
Tert-amyl methyl ether	<15 µg/kg	TM116	<15
1.2.4-Trichlorobenzene	<6 µg/kg	TM116	<6 #
Hexachlorobutadiene	<12 µg/kg	TM116	<12
Naphthalene	<13 µg/kg	TM116	<13 M
1.2.3-Trichlorobenzene	<6 µg/kg	TM116	<6 M

Table of Results - Appendix

SDG Number : 101006-33 **Client :** H_GRONTMIJ_SOL **Client Ref :**

REPORT KEY

Results expressed as (e.g.) 1.03E-07 is equivalent to 1.03x10-7

NDP	No Determination Possible	#	ISO 17025 Accredited	*	Subcontracted Test	M	MCERTS Accredited
NFD	No Fibres Detected	PFD	Possible Fibres Detected	»	Result previously reported (Incremental reports only)	EC	Equivalent Carbon (Aromatics C8-C35)

Note: Method detection limits are not always achievable due to various circumstances beyond our control

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
PM001		Preparation of Samples for Metals Analysis		
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material		
TM001	In - house Method	Determination of asbestos containing material by screening on solids		
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC		
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)		
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS		
TM132	In - house Method	ELTRA CS800 Operators Guide		
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter		
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser		
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the 'Skalar SANS+ System' Segmented Flow Analyser		
TM157	HP 6890 Gas Chromatograph (GC) system and HP 5973 Mass Selective Detector (MSD).	Determination of SVOC in Soils by GC-MS extracted by sonication in DCM/Acetone		
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID		
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES		
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer		

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

APPENDIX

APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH_4 by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. Results relate only to the items tested
13. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 – 130 %.
14. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).
16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
18. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
19. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GS MS
SVOC	DCM	LIQUID/LIQUID SHAKE	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM	LIQUID/LIQUID SHAKE	GC MS
TRIAZINE HERBS	DCM	LIQUID/LIQUID SHAKE	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	NONE	DIRECT INJECTION	GC FID

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

ALcontrol Laboratories

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Website: www.alcontrol.com

Grontmij
Radcliffe House
3rd Floor
Blenheim Court, Lode lane
Solihull
West Midlands
B912AA

Attention: Gareth Taylor

Please note that these lab results relate to multiple sites - the relevant addresses to this site are those on Stagborough Way, Herondale, Stafford Lane and Swallowfields Drive.

CERTIFICATE OF ANALYSIS

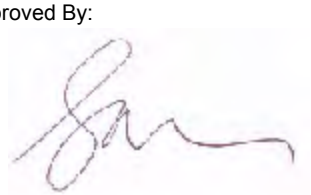
Date:	10 June 2011
Customer:	H_GRONTMIJ_SOL
Sample Delivery Group (SDG):	110602-58
Your Reference:	
Location:	Part 2a Assistance
Report No:	133432

We received 29 samples on Thursday June 02, 2011 and 25 of these samples were scheduled for analysis which was completed on Friday June 10, 2011. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	110602-58	**Location:**	Part 2a Assistance	**Order Number:**	
Job:	H_GRONTMIJ_SOL-54	**Customer:**	Grontmij	**Report Number:**	133432
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
3588820	1 NEWLANDS LANE FIVEWAYS		0.30	31/05/2011
3588809	10 WESTGATE			31/05/2011
3588808	11 GOODWOOD			31/05/2011
3588826	11 NEWLANDS COURT FIVEWAYS		0.30	31/05/2011
3588818	110 STAFFORD LANE			31/05/2011
3588805	121 ARMITAGE ROAD			31/05/2011
3588806	125 ARMITAGE ROAD			31/05/2011
3588811	2 SANDOWN			31/05/2011
3588819	21 HERONDALE			31/05/2011
3588807	3 SLADE VIEW RISE			31/05/2011
3588787	3A BLAKE CLOSE			31/05/2011
3588810	4 KEMPTON			31/05/2011
3588813	41 SWALLOWFIELDS			31/05/2011
3588822	5 NEWLANDS COURT FIVEWAYS		0.30	31/05/2011
3588814	73 STAGBOROUGH			31/05/2011
3588815	8 STAGBOROUGH WAY			31/05/2011
3588788	83 BLAKE CLOSE			31/05/2011
3588823	9 NEWLANDS COURT FIVEWAYS		0.30	31/05/2011
3588803	99 ARMITAGE ROAD			31/05/2011
3588802	FIVEWAYS 1 NEWLANDS LANE			31/05/2011
3588798	FIVEWAYS 11 NEWLANDS COURT			31/05/2011
3588799	FIVEWAYS 5 NEWLANDS COURT			31/05/2011
3588800	FIVEWAYS 9 NEWLANDS COURT			31/05/2011
3588795	VIEW ST. 32 FOSTERS AVE.			31/05/2011
3588793	VIEW ST. 53 VIEW ST.			31/05/2011
3588797	VIEW ST. 9 WARD ST.			31/05/2011
3588790	VIEW ST. WS2		1.20	31/05/2011
3588791	VIEW ST. WS3		1.10	31/05/2011
3588789	VIEW ST. WS4		1.60	31/05/2011

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

SDG:	110602-58	**Location:**	Part 2a Assistance	**Order Number:**	
Job:	H_GRONTMIJ_SOL-54	**Customer:**	Grontmij	**Report Number:**	133432
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

LIQUID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			3588802	FIVEWAYS 1			1l green glass bottle
			3588811	2 SANDOWN			1l green glass bottle
			3588790	VIEW ST. WS2		1.20	1l green glass bottle
			3588807	3 SLADE VIEW			Vial
			3588787	3A BLAKE CLOSE			1l green glass bottle
			3588791	VIEW ST. WS3		1.10	1l green glass bottle
			3588810	4 KEMPTON			1l green glass bottle
			3588789	VIEW ST. WS4		1.60	1l green glass bottle
			3588799	FIVEWAYS 5			Vial
			3588815	8 STAGBOROUGH			1l green glass bottle
			3588800	FIVEWAYS 9			1l green glass bottle
			3588797	VIEW ST. 9 WARD			1l green glass bottle
			3588809	10 WESTGATE			1l green glass bottle
			3588808	11 GOODWOOD			1l green glass bottle
			3588798	FIVEWAYS 11			1l green glass bottle
			3588819	21 HERONDALE			1l green glass bottle
			3588795	VIEW ST. 32			1l green glass bottle
			3588813	41			1l green glass bottle
			3588793	VIEW ST. 53 VIEW			1l green glass bottle
			3588814	73 STAGBOROUGH			1l green glass bottle
			3588788	83 BLAKE CLOSE			1l green glass bottle
			3588803	99 ARMITAGE			1l green glass bottle
			3588818	110 STAFFORD			1l green glass bottle
			3588805	121 ARMITAGE			1l green glass bottle
			3588806	125 ARMITAGE			1l green glass bottle
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 25	X X X X X X X X X X X X X X X X X X X X X X X X X				
Mercury Dissolved	All	NDPs: 0 Tests: 25	X X X X X X X X X X X X X X X X X X X X X X X X X				
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 25	X X X X X X X X X X X X X X X X X X X X X X X X X				
VOC MS (W)	All	NDPs: 0 Tests: 3	X X X				

CERTIFICATE OF ANALYSIS

SDG:	110602-58	**Location:**	Part 2a Assistance	**Order Number:**	
Job:	H_GRONTMIJ_SOL-54	**Customer:**	Grontmij	**Report Number:**	133432
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Non-conforming work.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	99 ARMITAGE ROAD	121 ARMITAGE ROAD	125 ARMITAGE ROAD	83 BLAKE CLOSE	3A BLAKE CLOSE	FIVEWAYS 5 NEWLANDS COURT
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	31/05/2011	31/05/2011	31/05/2011	31/05/2011	31/05/2011	31/05/2011
			Date Received	02/06/2011	02/06/2011	02/06/2011	02/06/2011	02/06/2011	02/06/2011
			SDG Ref	110602-58	110602-58	110602-58	110602-58	110602-58	110602-58
			Lab Sample No.(s)	3588803	3588805	3588806	3588788	3588787	3588799
			AGS Reference						
Antimony (diss.filt)	<0.16 µg/l	TM152		0.367 #	0.327 #	0.881 #	0.297 #	0.301 #	2.25 #
Arsenic (diss.filt)	<0.12 µg/l	TM152		3.67 #	5.16 #	3.97 #	2.1 #	1.42 #	2.13 #
Boron (diss.filt)	<9.4 µg/l	TM152		58.5 #	57.7 #	66.9 #	125 #	85.7 #	102 #
Cadmium (diss.filt)	<0.1 µg/l	TM152		<0.1 #	<0.1 #	<0.1 #	0.117 #	0.201 #	0.165 #
Chromium (diss.filt)	<0.22 µg/l	TM152		12.4 #	12.2 #	13.7 #	13.4 #	7.95 #	16.5 #
Copper (diss.filt)	<0.85 µg/l	TM152		288 #	9.02 #	5.51 #	24.7 #	740 #	266 #
Lead (diss.filt)	<0.02 µg/l	TM152		0.107 #	0.293 #	1.09 #	0.165 #	0.311 #	0.266 #
Nickel (diss.filt)	<0.15 µg/l	TM152		2.16 #	1.01 #	1.4 #	0.993 #	4.32 #	1.19 #
Zinc (diss.filt)	<0.41 µg/l	TM152		74.4 #	7.67 #	29.2 #	14.5 #	606 #	94.9 #
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #

CERTIFICATE OF ANALYSIS

SDG:	110602-58	**Location:**	Part 2a Assistance	**Order Number:**	
Job:	H_GRONTMIJ_SOL-54	**Customer:**	Grontmij	**Report Number:**	133432
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Non-conforming work.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	11 GOODWOOD	21 HERONDALE	4 KEMPTON	FIVEWAYS 9 NEWL ANDS COURT	FIVEWAYS 11 NEW LANDS COURT	FIVEWAYS 1 NEWL ANDS LANE
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	31/05/2011	31/05/2011	31/05/2011	31/05/2011	31/05/2011	31/05/2011
			Date Received	02/06/2011	02/06/2011	02/06/2011	02/06/2011	02/06/2011	02/06/2011
			SDG Ref	110602-58	110602-58	110602-58	110602-58	110602-58	110602-58
			Lab Sample No.(s)	3588808	3588819	3588810	3588800	3588798	3588802
			AGS Reference						
Antimony (diss.filt)	<0.16 µg/l	TM152		0.344 #	0.266 #	0.421 #	0.489 #	0.381 #	0.246 #
Arsenic (diss.filt)	<0.12 µg/l	TM152		1.85 #	2.08 #	2.03 #	2.22 #	1.94 #	2.06 #
Boron (diss.filt)	<9.4 µg/l	TM152		96.5 #	114 #	88.8 #	92.2 #	113 #	80.7 #
Cadmium (diss.filt)	<0.1 µg/l	TM152		<0.1 #	<0.1 #	<0.1 #	<0.1 #	0.101 #	<0.1 #
Chromium (diss.filt)	<0.22 µg/l	TM152		14.2 #	11.2 #	12.8 #	14.1 #	13.1 #	8.22 #
Copper (diss.filt)	<0.85 µg/l	TM152		49 #	96.6 #	32.7 #	176 #	48.5 #	73.3 #
Lead (diss.filt)	<0.02 µg/l	TM152		0.109 #	0.184 #	0.093 #	0.048 #	0.057 #	0.231 #
Nickel (diss.filt)	<0.15 µg/l	TM152		1.68 #	0.594 #	1.6 #	0.559 #	1.02 #	1.79 #
Zinc (diss.filt)	<0.41 µg/l	TM152		21.6 #	18 #	7.11 #	6.25 #	9.53 #	8.76 #
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #

CERTIFICATE OF ANALYSIS

SDG:	110602-58	**Location:**	Part 2a Assistance	**Order Number:**	
Job:	H_GRONTMIJ_SOL-54	**Customer:**	Grontmij	**Report Number:**	133432
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Non-conforming work.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	2 SANDOWN	3 SLADE VIEW RISE	110 STAFFORD LANE	73 STAGBOROUGH	8 STAGBOROUGH WAY	41 SWALLOWFIELDS
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	31/05/2011	31/05/2011	31/05/2011	31/05/2011	31/05/2011	31/05/2011
			Date Received	02/06/2011	02/06/2011	02/06/2011	02/06/2011	02/06/2011	02/06/2011
			SDG Ref	110602-58	110602-58	110602-58	110602-58	110602-58	110602-58
			Lab Sample No.(s)	3588811	3588807	3588818	3588814	3588815	3588813
			AGS Reference						
Antimony (diss.filt)	<0.16 µg/l	TM152		0.202 #	0.426 #	0.303 #	0.246 #	0.239 #	0.298 #
Arsenic (diss.filt)	<0.12 µg/l	TM152		1.92 #	1.85 #	2.03 #	2.32 #	2.03 #	2.16 #
Boron (diss.filt)	<9.4 µg/l	TM152		107 #	128 #	123 #	135 #	118 #	123 #
Cadmium (diss.filt)	<0.1 µg/l	TM152		0.201 #	<0.1 #	0.179 #	0.142 #	0.276 #	0.108 #
Chromium (diss.filt)	<0.22 µg/l	TM152		12.5 #	13.3 #	11.2 #	13.5 #	11.9 #	11.3 #
Copper (diss.filt)	<0.85 µg/l	TM152		118 #	175 #	120 #	19.2 #	91.2 #	9.23 #
Lead (diss.filt)	<0.02 µg/l	TM152		0.862 #	0.042 #	0.329 #	0.121 #	0.398 #	0.126 #
Nickel (diss.filt)	<0.15 µg/l	TM152		4.46 #	1.69 #	1.06 #	1.49 #	15.3 #	0.697 #
Zinc (diss.filt)	<0.41 µg/l	TM152		295 #	26 #	29.9 #	6.85 #	356 #	2.69 #
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #

CERTIFICATE OF ANALYSIS

SDG:	110602-58	**Location:**	Part 2a Assistance	**Order Number:**	
Job:	H_GRONTMIJ_SOL-54	**Customer:**	Grontmij	**Report Number:**	133432
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Non-conforming work.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	VIEW ST. 32 FOSTERS AVE.	VIEW ST. 53 VIEW ST.	VIEW ST. 9 WARD ST.	VIEW ST. WS2	VIEW ST. WS3	VIEW ST. WS4
			Depth (m)	.	.	.	1.20	1.10	1.60
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	31/05/2011	31/05/2011	31/05/2011	31/05/2011	31/05/2011	31/05/2011
			Date Received	02/06/2011	02/06/2011	02/06/2011	02/06/2011	02/06/2011	02/06/2011
			SDG Ref	110602-58	110602-58	110602-58	110602-58	110602-58	110602-58
			Lab Sample No.(s)	3588795	3588793	3588797	3588790	3588791	3588789
			AGS Reference						
Antimony (diss.filt)	<0.16 µg/l	TM152		0.449 #	0.697 #	0.236 #			
Arsenic (diss.filt)	<0.12 µg/l	TM152		1.71 #	1.88 #	3.17 #	0.535 #	1.1 #	0.912 #
Boron (diss.filt)	<9.4 µg/l	TM152		121 #	102 #	106 #	171 #	226 #	59.5 #
Cadmium (diss.filt)	<0.1 µg/l	TM152		0.179 #	0.381 #	0.149 #	0.605 #	<0.1 #	0.167 #
Chromium (diss.filt)	<0.22 µg/l	TM152		11.7 #	13.8 #	10 #	11.5 #	20.9 #	28.6 #
Copper (diss.filt)	<0.85 µg/l	TM152		302 #	644 #	361 #	2.24 #	3.42 #	<0.85 #
Lead (diss.filt)	<0.02 µg/l	TM152		4.37 #	0.103 #	0.23 #	0.072 #	0.16 #	0.05 #
Nickel (diss.filt)	<0.15 µg/l	TM152		4.71 #	1.66 #	3.73 #	3.9 #	3.3 #	3.91 #
Vanadium (diss.filt)	<0.24 µg/l	TM152					2.88 #	4.02 #	8.48 #
Zinc (diss.filt)	<0.41 µg/l	TM152		175 #	661 #	293 #	15.9 #	4.05 #	<0.41 #
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #

CERTIFICATE OF ANALYSIS

SDG:	110602-58	**Location:**	Part 2a Assistance	**Order Number:**	
Job:	H_GRONTMIJ_SOL-54	**Customer:**	Grontmij	**Report Number:**	133432
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Non-conforming work.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	10 WESTGATE
			Depth (m)	.
			Sample Type	Water(GW/SW)
			Date Sampled	31/05/2011
			Date Received	02/06/2011
			SDG Ref	110602-58
			Lab Sample No.(s)	3588809
			AGS Reference	
Antimony (diss.filt)	<0.16 µg/l	TM152		0.203 #
Arsenic (diss.filt)	<0.12 µg/l	TM152		2.18 #
Boron (diss.filt)	<9.4 µg/l	TM152		106 #
Cadmium (diss.filt)	<0.1 µg/l	TM152		<0.1 #
Chromium (diss.filt)	<0.22 µg/l	TM152		13.9 #
Copper (diss.filt)	<0.85 µg/l	TM152		27.6 #
Lead (diss.filt)	<0.02 µg/l	TM152		0.066 #
Nickel (diss.filt)	<0.15 µg/l	TM152		1.47 #
Zinc (diss.filt)	<0.41 µg/l	TM152		9.15 #
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01 #

CERTIFICATE OF ANALYSIS

SDG:	110602-58	**Location:**	Part 2a Assistance	**Order Number:**	
Job:	H_GRONTMIJ_SOL-54	**Customer:**	Grontmij	**Report Number:**	133432
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

PAH Spec MS - Aqueous (W)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Non-conforming work.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	99 ARMITAGE ROAD	121 ARMITAGE ROAD	125 ARMITAGE ROAD	83 BLAKE CLOSE	3A BLAKE CLOSE	FIVEWAYS 5 NEWLANDS COURT
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	31/05/2011	31/05/2011	31/05/2011	31/05/2011	31/05/2011	31/05/2011
			Date Received	02/06/2011	02/06/2011	02/06/2011	02/06/2011	02/06/2011	02/06/2011
			SDG Ref	110602-58	110602-58	110602-58	110602-58	110602-58	110602-58
			Lab Sample No.(s)	3588803	3588805	3588806	3588788	3588787	3588799
			AGS Reference						
Naphthalene (aq)	<0.1 µg/l	TM178		<0.1 #	<0.1 #	<0.1 #	0.11 #	<0.1 #	<0.1 #
Acenaphthene (aq)	<0.015 µg/l	TM178		<0.015 #	<0.015 #	<0.015 #	<0.015 #	<0.015 #	<0.015 #
Acenaphthylene (aq)	<0.011 µg/l	TM178		<0.011 #	<0.011 #	<0.011 #	<0.011 #	<0.011 #	<0.011 #
Fluoranthene (aq)	<0.017 µg/l	TM178		<0.017 #	<0.017 #	<0.017 #	<0.017 #	<0.017 #	<0.017 #
Anthracene (aq)	<0.015 µg/l	TM178		<0.015 #	<0.015 #	<0.015 #	<0.015 #	<0.015 #	<0.015 #
Phenanthrene (aq)	<0.022 µg/l	TM178		<0.022 #	<0.022 #	<0.022 #	<0.022 #	<0.022 #	<0.022 #
Fluorene (aq)	<0.014 µg/l	TM178		<0.014 #	<0.014 #	<0.014 #	<0.014 #	<0.014 #	<0.014 #
Chrysene (aq)	<0.013 µg/l	TM178		<0.013 #	<0.013 #	<0.013 #	<0.013 #	<0.013 #	<0.013 #
Pyrene (aq)	<0.015 µg/l	TM178		<0.015 #	<0.015 #	<0.015 #	<0.015 #	<0.015 #	<0.015 #
Benzo(a)anthracene (aq)	<0.017 µg/l	TM178		<0.017 #	<0.017 #	<0.017 #	<0.017 #	<0.017 #	<0.017 #
Benzo(b)fluoranthene (aq)	<0.023 µg/l	TM178		<0.023 #	<0.023 #	<0.023 #	<0.023 #	<0.023 #	<0.023 #
Benzo(k)fluoranthene (aq)	<0.027 µg/l	TM178		<0.027 #	<0.027 #	<0.027 #	<0.027 #	<0.027 #	<0.027 #
Benzo(a)pyrene (aq)	<0.009 µg/l	TM178		<0.009 #	<0.009 #	<0.009 #	<0.009 #	<0.009 #	<0.009 #
Dibenzo(a,h)anthracene (aq)	<0.016 µg/l	TM178		<0.016 #	<0.016 #	<0.016 #	<0.016 #	<0.016 #	<0.016 #
Benzo(g,h,i)perylene (aq)	<0.016 µg/l	TM178		<0.016 #	<0.016 #	<0.016 #	<0.016 #	<0.016 #	<0.016 #
Indeno(1,2,3-cd)pyrene (aq)	<0.014 µg/l	TM178		<0.014 #	<0.014 #	<0.014 #	<0.014 #	<0.014 #	<0.014 #
PAH, Total Detected USEPA 16 (aq)	µg/l	TM178		none detected	none detected	none detected	0.11	none detected	none detected

CERTIFICATE OF ANALYSIS

SDG:	110602-58	**Location:**	Part 2a Assistance	**Order Number:**	
Job:	H_GRONTMIJ_SOL-54	**Customer:**	Grontmij	**Report Number:**	133432
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

PAH Spec MS - Aqueous (W)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Non-conforming work.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	11 GOODWOOD	21 HERONDALE	4 KEMPTON	FIVEWAYS 9 NEWL ANDS COURT	FIVEWAYS 11 NEW LANDS COURT	FIVEWAYS 1 NEWL ANDS LANE
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	31/05/2011	31/05/2011	31/05/2011	31/05/2011	31/05/2011	31/05/2011
			Date Received	02/06/2011	02/06/2011	02/06/2011	02/06/2011	02/06/2011	02/06/2011
			SDG Ref	110602-58	110602-58	110602-58	110602-58	110602-58	110602-58
			Lab Sample No.(s)	3588808	3588819	3588810	3588800	3588798	3588802
			AGS Reference						
Naphthalene (aq)	<0.1 µg/l	TM178		<0.1 #	<0.1 #	<0.1 #	<0.1 #	0.121 #	<0.1 #
Acenaphthene (aq)	<0.015 µg/l	TM178		<0.015 #	<0.015 #	<0.015 #	<0.015 #	<0.015 #	<0.015 #
Acenaphthylene (aq)	<0.011 µg/l	TM178		<0.011 #	<0.011 #	<0.011 #	<0.011 #	<0.011 #	<0.011 #
Fluoranthene (aq)	<0.017 µg/l	TM178		<0.017 #	<0.017 #	<0.017 #	<0.017 #	<0.017 #	<0.017 #
Anthracene (aq)	<0.015 µg/l	TM178		<0.015 #	<0.015 #	<0.015 #	<0.015 #	<0.015 #	<0.015 #
Phenanthrene (aq)	<0.022 µg/l	TM178		<0.022 #	<0.022 #	<0.022 #	<0.022 #	<0.022 #	<0.022 #
Fluorene (aq)	<0.014 µg/l	TM178		<0.014 #	<0.014 #	<0.014 #	<0.014 #	<0.014 #	<0.014 #
Chrysene (aq)	<0.013 µg/l	TM178		<0.013 #	<0.013 #	<0.013 #	<0.013 #	<0.013 #	<0.013 #
Pyrene (aq)	<0.015 µg/l	TM178		<0.015 #	<0.015 #	<0.015 #	<0.015 #	<0.015 #	<0.015 #
Benzo(a)anthracene (aq)	<0.017 µg/l	TM178		<0.017 #	<0.017 #	<0.017 #	<0.017 #	<0.017 #	<0.017 #
Benzo(b)fluoranthene (aq)	<0.023 µg/l	TM178		<0.023 #	<0.023 #	<0.023 #	<0.023 #	<0.023 #	<0.023 #
Benzo(k)fluoranthene (aq)	<0.027 µg/l	TM178		<0.027 #	<0.027 #	<0.027 #	<0.027 #	<0.027 #	<0.027 #
Benzo(a)pyrene (aq)	<0.009 µg/l	TM178		<0.009 #	<0.009 #	<0.009 #	<0.009 #	<0.009 #	<0.009 #
Dibenzo(a,h)anthracene (aq)	<0.016 µg/l	TM178		<0.016 #	<0.016 #	<0.016 #	<0.016 #	<0.016 #	<0.016 #
Benzo(g,h,i)perylene (aq)	<0.016 µg/l	TM178		<0.016 #	<0.016 #	<0.016 #	<0.016 #	<0.016 #	<0.016 #
Indeno(1,2,3-cd)pyrene (aq)	<0.014 µg/l	TM178		<0.014 #	<0.014 #	<0.014 #	<0.014 #	<0.014 #	<0.014 #
PAH, Total Detected USEPA 16 (aq)	µg/l	TM178		none detected	none detected	none detected	none detected	0.121	none detected

CERTIFICATE OF ANALYSIS

SDG:	110602-58	**Location:**	Part 2a Assistance	**Order Number:**	
Job:	H_GRONTMIJ_SOL-54	**Customer:**	Grontmij	**Report Number:**	133432
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

PAH Spec MS - Aqueous (W)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Non-conforming work.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	2 SANDOWN	3 SLADE VIEW RISE	110 STAFFORD LANE	73 STAGBOROUGH	8 STAGBOROUGH WAY	41 SWALLOWFIELDS
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	31/05/2011	31/05/2011	31/05/2011	31/05/2011	31/05/2011	31/05/2011
			Date Received	02/06/2011	02/06/2011	02/06/2011	02/06/2011	02/06/2011	02/06/2011
			SDG Ref	110602-58	110602-58	110602-58	110602-58	110602-58	110602-58
			Lab Sample No.(s)	3588811	3588807	3588818	3588814	3588815	3588813
			AGS Reference						
Naphthalene (aq)	<0.1 µg/l	TM178		<0.1 #	0.103 #	0.131 #	<0.1 #	<0.1 #	<0.1 #
Acenaphthene (aq)	<0.015 µg/l	TM178		<0.015 #	<0.015 #	<0.015 #	<0.015 #	<0.015 #	<0.015 #
Acenaphthylene (aq)	<0.011 µg/l	TM178		<0.011 #	<0.011 #	<0.011 #	<0.011 #	<0.011 #	<0.011 #
Fluoranthene (aq)	<0.017 µg/l	TM178		<0.017 #	<0.017 #	<0.017 #	<0.017 #	<0.017 #	<0.017 #
Anthracene (aq)	<0.015 µg/l	TM178		<0.015 #	<0.015 #	<0.015 #	<0.015 #	<0.015 #	<0.015 #
Phenanthrene (aq)	<0.022 µg/l	TM178		<0.022 #	<0.022 #	<0.022 #	<0.022 #	<0.022 #	<0.022 #
Fluorene (aq)	<0.014 µg/l	TM178		<0.014 #	<0.014 #	<0.014 #	<0.014 #	<0.014 #	<0.014 #
Chrysene (aq)	<0.013 µg/l	TM178		<0.013 #	<0.013 #	<0.013 #	<0.013 #	<0.013 #	<0.013 #
Pyrene (aq)	<0.015 µg/l	TM178		<0.015 #	<0.015 #	<0.015 #	<0.015 #	<0.015 #	<0.015 #
Benzo(a)anthracene (aq)	<0.017 µg/l	TM178		<0.017 #	<0.017 #	<0.017 #	<0.017 #	<0.017 #	<0.017 #
Benzo(b)fluoranthene (aq)	<0.023 µg/l	TM178		<0.023 #	<0.023 #	<0.023 #	<0.023 #	<0.023 #	<0.023 #
Benzo(k)fluoranthene (aq)	<0.027 µg/l	TM178		<0.027 #	<0.027 #	<0.027 #	<0.027 #	<0.027 #	<0.027 #
Benzo(a)pyrene (aq)	<0.009 µg/l	TM178		<0.009 #	<0.009 #	<0.009 #	<0.009 #	<0.009 #	<0.009 #
Dibenzo(a,h)anthracene (aq)	<0.016 µg/l	TM178		<0.016 #	<0.016 #	<0.016 #	<0.016 #	<0.016 #	<0.016 #
Benzo(g,h,i)perylene (aq)	<0.016 µg/l	TM178		<0.016 #	<0.016 #	<0.016 #	<0.016 #	<0.016 #	<0.016 #
Indeno(1,2,3-cd)pyrene (aq)	<0.014 µg/l	TM178		<0.014 #	<0.014 #	<0.014 #	<0.014 #	<0.014 #	<0.014 #
PAH, Total Detected USEPA 16 (aq)	µg/l	TM178		none detected	0.103	0.131	none detected	none detected	none detected

CERTIFICATE OF ANALYSIS

SDG:	110602-58	**Location:**	Part 2a Assistance	**Order Number:**	
Job:	H_GRONTMIJ_SOL-54	**Customer:**	Grontmij	**Report Number:**	133432
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

PAH Spec MS - Aqueous (W)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Non-conforming work.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	VIEW ST. 32 FOSTERS AVE.	VIEW ST. 53 VIEW ST.	VIEW ST. 9 WARD ST.	VIEW ST. WS2	VIEW ST. WS3	VIEW ST. WS4
			Depth (m)	.	.	.	1.20	1.10	1.60
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	31/05/2011	31/05/2011	31/05/2011	31/05/2011	31/05/2011	31/05/2011
			Date Received	02/06/2011	02/06/2011	02/06/2011	02/06/2011	02/06/2011	02/06/2011
			SDG Ref	110602-58	110602-58	110602-58	110602-58	110602-58	110602-58
			Lab Sample No.(s)	3588795	3588793	3588797	3588790	3588791	3588789
			AGS Reference						
Naphthalene (aq)	<0.1 µg/l	TM178		0.104 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #
Acenaphthene (aq)	<0.015 µg/l	TM178		<0.015 #	<0.015 #	<0.015 #	<0.015 #	0.0225 #	0.0156 #
Acenaphthylene (aq)	<0.011 µg/l	TM178		<0.011 #	<0.011 #	<0.011 #	<0.011 #	0.0181 #	<0.011 #
Fluoranthene (aq)	<0.017 µg/l	TM178		<0.017 #	<0.017 #	<0.017 #	<0.017 #	0.981 #	0.465 #
Anthracene (aq)	<0.015 µg/l	TM178		<0.015 #	<0.015 #	<0.015 #	<0.015 #	0.0538 #	0.0302 #
Phenanthrene (aq)	<0.022 µg/l	TM178		<0.022 #	<0.022 #	<0.022 #	<0.022 #	0.217 #	0.13 #
Fluorene (aq)	<0.014 µg/l	TM178		<0.014 #	<0.014 #	<0.014 #	<0.014 #	<0.014 #	<0.014 #
Chrysene (aq)	<0.013 µg/l	TM178		<0.013 #	<0.013 #	<0.013 #	<0.013 #	0.935 #	0.434 #
Pyrene (aq)	<0.015 µg/l	TM178		<0.015 #	<0.015 #	<0.015 #	<0.015 #	1.11 #	0.559 #
Benzo(a)anthracene (aq)	<0.017 µg/l	TM178		<0.017 #	<0.017 #	<0.017 #	<0.017 #	0.565 #	0.283 #
Benzo(b)fluoranthene (aq)	<0.023 µg/l	TM178		<0.023 #	<0.023 #	<0.023 #	<0.023 #	0.625 #	0.279 #
Benzo(k)fluoranthene (aq)	<0.027 µg/l	TM178		<0.027 #	<0.027 #	<0.027 #	<0.027 #	0.815 #	0.33 #
Benzo(a)pyrene (aq)	<0.009 µg/l	TM178		<0.009 #	<0.009 #	<0.009 #	<0.009 #	0.916 #	0.352 #
Dibenzo(a,h)anthracene (aq)	<0.016 µg/l	TM178		<0.016 #	<0.016 #	<0.016 #	<0.016 #	0.112 #	0.0359 #
Benzo(g,h,i)perylene (aq)	<0.016 µg/l	TM178		<0.016 #	<0.016 #	<0.016 #	<0.016 #	0.689 #	0.198 #
Indeno(1,2,3-cd)pyrene (aq)	<0.014 µg/l	TM178		<0.014 #	<0.014 #	<0.014 #	<0.014 #	0.54 #	0.164 #
PAH, Total Detected USEPA 16 (aq)	µg/l	TM178		0.104	none detected	none detected	none detected	7.6	3.28

CERTIFICATE OF ANALYSIS

SDG:	110602-58	**Location:**	Part 2a Assistance	**Order Number:**	
Job:	H_GRONTMIJ_SOL-54	**Customer:**	Grontmij	**Report Number:**	133432
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

PAH Spec MS - Aqueous (W)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Non-conforming work.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	10 WESTGATE
			Depth (m)	.
			Sample Type	Water(GW/SW)
			Date Sampled	31/05/2011
			Date Received	02/06/2011
			SDG Ref	110602-58
			Lab Sample No.(s)	3588809
			AGS Reference	
Naphthalene (aq)	<0.1 µg/l	TM178		<0.1 #
Acenaphthene (aq)	<0.015 µg/l	TM178		<0.015 #
Acenaphthylene (aq)	<0.011 µg/l	TM178		<0.011 #
Fluoranthene (aq)	<0.017 µg/l	TM178		<0.017 #
Anthracene (aq)	<0.015 µg/l	TM178		<0.015 #
Phenanthrene (aq)	<0.022 µg/l	TM178		<0.022 #
Fluorene (aq)	<0.014 µg/l	TM178		<0.014 #
Chrysene (aq)	<0.013 µg/l	TM178		<0.013 #
Pyrene (aq)	<0.015 µg/l	TM178		<0.015 #
Benzo(a)anthracene (aq)	<0.017 µg/l	TM178		<0.017 #
Benzo(b)fluoranthene (aq)	<0.023 µg/l	TM178		<0.023 #
Benzo(k)fluoranthene (aq)	<0.027 µg/l	TM178		<0.027 #
Benzo(a)pyrene (aq)	<0.009 µg/l	TM178		<0.009 #
Dibenzo(a,h)anthracene (aq)	<0.016 µg/l	TM178		<0.016 #
Benzo(g,h,i)perylene (aq)	<0.016 µg/l	TM178		<0.016 #
Indeno(1,2,3-cd)pyrene (aq)	<0.014 µg/l	TM178		<0.014 #
PAH, Total Detected USEPA 16 (aq)	µg/l	TM178		none detected

CERTIFICATE OF ANALYSIS

SDG:	110602-58	**Location:**	Part 2a Assistance	**Order Number:**	
Job:	H_GRONTMIJ_SOL-54	**Customer:**	Grontmij	**Report Number:**	133432
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

VOC MS (W)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Non-conforming work.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	VIEW ST. WS2	VIEW ST. WS3	VIEW ST. WS4			
			Depth (m)	1.20	1.10	1.60			
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)			
			Date Sampled	31/05/2011	31/05/2011	31/05/2011			
			Date Received	02/06/2011	02/06/2011	02/06/2011			
			SDG Ref	110602-58	110602-58	110602-58			
			Lab Sample No.(s)	3588790	3588791	3588789			
			AGS Reference						
Toluene-d8**	%	TM208		98.2	99	99.3			
Methyl tertiary butyl ether (MTBE)	<1.6 µg/l	TM208		<1.6 #	<1.6 #	<1.6 #			
Benzene	<1.3 µg/l	TM208		<1.3 #	<1.3 #	<1.3 #			
Toluene	<1.4 µg/l	TM208		<1.4 #	<1.4 #	<1.4 #			
Ethylbenzene	<2.5 µg/l	TM208		<2.5 #	<2.5 #	<2.5 #			
m,p-Xylene	<2.5 µg/l	TM208		<2.5 #	<2.5 #	<2.5 #			
o-Xylene	<1.7 µg/l	TM208		<1.7 #	<1.7 #	<1.7 #			

CERTIFICATE OF ANALYSIS

SDG:	110602-58	**Location:**	Part 2a Assistance	**Order Number:**	
Job:	H_GRONTMIJ_SOL-54	**Customer:**	Grontmij	**Report Number:**	133432
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

Table of Results - Appendix

REPORT KEY

Results expressed as (e.g.) 1.03E-07 is equivalent to 1.03x10-7

NDP	No Determination Possible	#	ISO 17025 Accredited	*	Subcontracted Test	M	MCERTS Accredited
NFD	No Fibres Detected	PFD	Possible Fibres Detected	»	Result previously reported (Incremental reports only)	EC	Equivalent Carbon (Aromatics C8-C35)

Note: Method detection limits are not always achievable due to various circumstances beyond our control

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters		

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

CERTIFICATE OF ANALYSIS

SDG:	110602-58	**Location:**	Part 2a Assistance	**Order Number:**	
Job:	H_GRONTMIJ_SOL-54	**Customer:**	Grontmij	**Report Number:**	133432
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	3588803	3588805	3588806	3588788	3588808	3588787	3588799	3588800	3588798	3588802
Customer Sample Ref.	99 ARMITAGE ROAD	121 ARMITAGE ROAD	125 ARMITAGE ROAD	83 BLAKE CLOSE	11 GOODWOOD	3A BLAKE CLOSE	FIVEWAYS 5 NEWLANDS COURT	FIVEWAYS 9 NEWLANDS COURT	FIVEWAYS 11 NEWLANDS COURT	FIVEWAYS 1 NEWLANDS LANE
AGS Ref.										
Depth										
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
Dissolved Metals by ICP-MS	08-Jun-2011	08-Jun-2011	08-Jun-2011	08-Jun-2011	07-Jun-2011	08-Jun-2011	09-Jun-2011	09-Jun-2011	08-Jun-2011	08-Jun-2011
Mercury Dissolved	07-Jun-2011	07-Jun-2011	08-Jun-2011	07-Jun-2011	07-Jun-2011	08-Jun-2011	08-Jun-2011	08-Jun-2011	07-Jun-2011	08-Jun-2011
PAH Spec MS - Aqueous (W)	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011

Lab Sample No(s)	3588819	3588810	3588811	3588807	3588818	3588814	3588815	3588813	3588795	3588793
Customer Sample Ref.	21 HERONDALE	4 KEMPTON	2 SANDOWN	3 SLADE VIEW RISE	110 STAFFORD LANE	73 STAGBOROUGH	3 STAGBOROUGH WAY	41 SWALLOWFIELDS	VIEW ST. 32 FOSTERS AVE.	VIEW ST. 53 VIEW ST.
AGS Ref.										
Depth										
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
Dissolved Metals by ICP-MS	08-Jun-2011	08-Jun-2011	08-Jun-2011	08-Jun-2011	08-Jun-2011	08-Jun-2011	08-Jun-2011	08-Jun-2011	08-Jun-2011	09-Jun-2011
Mercury Dissolved	07-Jun-2011	08-Jun-2011	08-Jun-2011	07-Jun-2011	07-Jun-2011	08-Jun-2011	07-Jun-2011	07-Jun-2011	07-Jun-2011	08-Jun-2011
PAH Spec MS - Aqueous (W)	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011

Lab Sample No(s)	3588809	3588797	3588790	3588791	3588789
Customer Sample Ref.	10 WESTGATE	VIEW ST. 9 WARD ST.	VIEW ST. WS2	VIEW ST. WS3	VIEW ST. WS4
AGS Ref.					
Depth			1.20	1.10	1.60
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
Dissolved Metals by ICP-MS	07-Jun-2011	10-Jun-2011	08-Jun-2011	08-Jun-2011	09-Jun-2011
Mercury Dissolved	07-Jun-2011	07-Jun-2011	07-Jun-2011	07-Jun-2011	08-Jun-2011
PAH Spec MS - Aqueous (W)	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011
VOC MS (W)			09-Jun-2011	09-Jun-2011	09-Jun-2011

SDG:	110602-58	**Location:**	Part 2a Assistance	**Order Number:**	
Job:	H_GRONTMIJ_SOL-54	**Customer:**	Grontmij	**Report Number:**	133432
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

Appendix

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH4 by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.

7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample -similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP -No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.

11. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.

14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors
employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials -whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute themajor part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 -C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
SOLVENT EXTRACTABLE MATTER	D&C	DCM	SOXTHERM	GRAVIMETRIC
CYCLOHEXANE EXT. MATTER	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
THIN LAYER CHROMATOGRAPHY	D&C	DCM	SOXTHERM	IATROSCAN
ELEMENTAL SULPHUR	D&C	DCM	SOXTHERM	HPLC
PHENOLS BY GCMS	WET	DCM	SOXTHERM	GCMS
HERBICIDES	D&C	HEXANE/ACETONE	SOXTHERM	GCMS
PESTICIDES	D&C	HEXANE/ACETONE	SOXTHERM	GCMS
EPH (DRO)	D&C	HEXANE/ACETONE	END OVER END	GCFID
EPH (MIN OIL)	D&C	HEXANE/ACETONE	END OVER END	GCFID
EPH (CLEANED UP)	D&C	HEXANE/ACETONE	END OVER END	GCFID
EPH CWG BY GC	D&C	HEXANE/ACETONE	END OVER END	GCFID
PCB TOT / PCB CON	D&C	HEXANE/ACETONE	END OVER END	GCMS
POLYAROMATIC HYDROCARBONS (MS)	WET	HEXANE/ACETONE	MICROWAVE TM218.	GCMS
C8-C40 (C8-C40) EZ FLASH	WET	HEXANE/ACETONE	SHAKER	GCEZ
POLYAROMATIC HYDROCARBONS RAPID GC	WET	HEXANE/ACETONE	SHAKER	GCEZ
SEMI VOLATILE ORGANIC COMPOUNDS	WET	DCM/ACETONE	SONICATE	GCMS

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GCMS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GCMS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GCMS
SVOC	DCM	LIQUID/LIQUID SHAKE	GCMS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM	LIQUID/LIQUID SHAKE	GCMS
TRIAZINE HERBS	DCM	LIQUID/LIQUID SHAKE	GCMS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GCMS
TPH by INFRARED (IR)	TCE	LIQUID/LIQUID SHAKE	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID SHAKE	HPLC
GLYCOLS	NONE	DIRECT INJECTION	GCMS

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials or those identified as potentially asbestos containing during sample description which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -
Trace -Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

ALcontrol Laboratories

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Grontmij
Radcliffe House
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Blenheim Court, Lode lane
Solihull
West Midlands
B912AA

Attention: Gareth Taylor

CERTIFICATE OF ANALYSIS

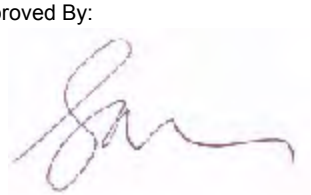
Date:	09 July 2011
Customer:	H_GRONTMIJ_SOL
Sample Delivery Group (SDG):	110622-95
Your Reference:	
Location:	Stagborough
Report No:	138581

We received 8 samples on Wednesday June 22, 2011 and 8 of these samples were scheduled for analysis which was completed on Saturday July 09, 2011. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	110622-95	**Location:**	Stagborough	**Order Number:**	
Job:	H_GRONTMIJ_SOL-27	**Customer:**	Grontmij	**Report Number:**	138581
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
3724065	S01		0.50	20/06/2011
3724067	S02		0.20	20/06/2011
3724068	S03		0.10	20/06/2011
3724069	S04		0.10	20/06/2011
3724070	S05		0.40	20/06/2011
3724072	SW01			20/06/2011
3724073	SW02			20/06/2011
3724074	SW03			20/06/2011

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

SDG:	110622-95	**Location:**	Stagborough	**Order Number:**	
Job:	H_GRONTMIJ_SOL-27	**Customer:**	Grontmij	**Report Number:**	138581
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

LIQUID

Results Legend

X Test

N No Determination Possible

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			3724072	SW01			1l green glass bottle
			3724073	SW02			1l green glass bottle
			3724074	SW03			1l green glass bottle
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 3	X	X	X		
Mercury Dissolved	All	NDPs: 0 Tests: 3	X	X	X		
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 3	X	X	X		
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 3	X	X	X		

CERTIFICATE OF ANALYSIS

SDG:	110622-95	**Location:**	Stagborough	**Order Number:**	
Job:	H_GRONTMIJ_SOL-27	**Customer:**	Grontmij	**Report Number:**	138581
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

SOLID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			3724065	S01		0.50	250g Amber Jar (AL
			3724067	S02		0.20	250g Amber Jar (AL
			3724068	S03		0.10	250g Amber Jar (AL
			3724069	S04		0.10	250g Amber Jar (AL
			3724070	S05		0.40	250g Amber Jar (AL
Metals by iCap-OES (Soil)	Arsenic	NDPs: 0 Tests: 5	X	X	X	X	X
	Boron	NDPs: 0 Tests: 5	X	X	X	X	X
	Cadmium	NDPs: 0 Tests: 5	X	X	X	X	X
	Chromium	NDPs: 0 Tests: 5	X	X	X	X	X
	Copper	NDPs: 0 Tests: 5	X	X	X	X	X
	Lead	NDPs: 0 Tests: 5	X	X	X	X	X
	Mercury	NDPs: 0 Tests: 5	X	X	X	X	X
	Nickel	NDPs: 0 Tests: 5	X	X	X	X	X
	Vanadium	NDPs: 0 Tests: 5	X	X	X	X	X
	Zinc	NDPs: 0 Tests: 5	X	X	X	X	X
PAH by GCMS	All	NDPs: 0 Tests: 5	X	X	X	X	X
Sample description	All	NDPs: 0 Tests: 5	X	X	X	X	X

CERTIFICATE OF ANALYSIS

SDG:	110622-95	**Location:**	Stagborough	**Order Number:**	
Job:	H_GRONTMIJ_SOL-27	**Customer:**	Grontmij	**Report Number:**	138581
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Grain size	Inclusions	Inclusions 2
3724065	S01	0.50	Dark Brown	Top Soil	0.1 - 2 mm	Stones	Crushed Brick
3724067	S02	0.20	Dark Brown	Top Soil	0.1 - 2 mm	Stones	Crushed Brick
3724068	S03	0.10	Dark Brown	Top Soil	0.1 - 2 mm	Stones	Crushed Brick
3724069	S04	0.10	Dark Brown	Top Soil	0.1 - 2 mm	Stones	Crushed Brick
3724070	S05	0.40	Dark Brown	Top Soil	0.063 - 0.1 mm	Stones	Crushed Brick

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

SDG:	110622-95	**Location:**	Stagborough	**Order Number:**	
Job:	H_GRONTMIJ_SOL-27	**Customer:**	Grontmij	**Report Number:**	138581
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Non-conforming work.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	S01	S02	S03	S04	S05	SW01
			Depth (m)	0.50	0.20	0.10	0.10	0.40	.
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Water(GW/SW)
			Date Sampled	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011
			Date Received	22/06/2011	22/06/2011	22/06/2011	22/06/2011	22/06/2011	22/06/2011
			SDG Ref	110622-95	110622-95	110622-95	110622-95	110622-95	110622-95
			Lab Sample No.(s)	3724065	3724067	3724068	3724069	3724070	3724072
			AGS Reference						
Arsenic (diss.filt)	<0.12 µg/l	TM152							0.926 #
Boron (diss.filt)	<9.4 µg/l	TM152							153 #
Cadmium (diss.filt)	<0.1 µg/l	TM152							0.134 #
Chromium (diss.filt)	<0.22 µg/l	TM152							5.68 #
Copper (diss.filt)	<0.85 µg/l	TM152							4.32 #
Lead (diss.filt)	<0.02 µg/l	TM152							0.186 #
Nickel (diss.filt)	<0.15 µg/l	TM152							<0.15 #
Vanadium (diss.filt)	<0.24 µg/l	TM152							<0.24 #
Zinc (diss.filt)	<0.41 µg/l	TM152							22.5 #
Mercury (diss.filt)	<0.01 µg/l	TM183							<0.01 #
Hardness, Total as CaCO3	<1 mg/l	TM228							146 #
Arsenic	<0.6 mg/kg	TM181		8.61 M	8.76 M	9.55 M	13.4 M	6.97 M	
Boron	<0.7 mg/kg	TM181		11.3 #	16.4 #	17.2 #	13.6 #	7.65 #	
Cadmium	<0.02 mg/kg	TM181		0.586 M	0.602 M	0.679 M	0.746 M	0.442 M	
Chromium	<0.9 mg/kg	TM181		16 M	27.6 M	18.8 M	66.3 M	13.5 M	
Copper	<1.4 mg/kg	TM181		28.9 M	29.3 M	31.5 M	56.1 M	19 M	
Lead	<0.7 mg/kg	TM181		37.3 M	45.8 M	42.4 M	53.8 M	32.7 M	
Mercury	<0.14 mg/kg	TM181		<0.14 M	<0.14 M	<0.14 M	<0.14 M	<0.14 M	
Nickel	<0.2 mg/kg	TM181		24.7 M	28.7 M	28.7 M	33.3 M	18.4 M	
Vanadium	<0.2 mg/kg	TM181		25.6 #	51.8 #	28 #	27.8 #	19.7 #	
Zinc	<1.9 mg/kg	TM181		140 M	143 M	173 M	203 M	93.3 M	

CERTIFICATE OF ANALYSIS

SDG:	110622-95	**Location:**	Stagborough	**Order Number:**	
Job:	H_GRONTMIJ_SOL-27	**Customer:**	Grontmij	**Report Number:**	138581
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Non-conforming work.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	SW02	SW03
			Depth (m)	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)
			Date Sampled	20/06/2011	20/06/2011
			Date Received	22/06/2011	22/06/2011
			SDG Ref	110622-95	110622-95
			Lab Sample No.(s)	3724073	3724074
			AGS Reference		
Arsenic (diss.filt)	<0.12 µg/l	TM152		0.616 #	0.988 #
Boron (diss.filt)	<9.4 µg/l	TM152		180 #	349 #
Cadmium (diss.filt)	<0.1 µg/l	TM152		<0.1 #	0.101 #
Chromium (diss.filt)	<0.22 µg/l	TM152		4.54 #	7.34 #
Copper (diss.filt)	<0.85 µg/l	TM152		2.86 #	4.78 #
Lead (diss.filt)	<0.02 µg/l	TM152		0.152 #	0.267 #
Nickel (diss.filt)	<0.15 µg/l	TM152		<0.15 #	0.648 #
Vanadium (diss.filt)	<0.24 µg/l	TM152		<0.24 #	<0.24 #
Zinc (diss.filt)	<0.41 µg/l	TM152		8.11 #	9.84 #
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01 #	<0.01 #
Hardness, Total as CaCO3	<1 mg/l	TM228		168 #	254 #

CERTIFICATE OF ANALYSIS

SDG:	110622-95	**Location:**	Stagborough	**Order Number:**	
Job:	H_GRONTMIJ_SOL-27	**Customer:**	Grontmij	**Report Number:**	138581
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

PAH by GCMS

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Non-conforming work.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	S01	S02	S03	S04	S05
			Depth (m)	0.50	0.20	0.10	0.10	0.40
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	20/06/2011	20/06/2011	20/06/2011	20/06/2011	20/06/2011
			Date Received	22/06/2011	22/06/2011	22/06/2011	22/06/2011	22/06/2011
			SDG Ref	110622-95	110622-95	110622-95	110622-95	110622-95
			Lab Sample No.(s)	3724065	3724067	3724068	3724069	3724070
			AGS Reference					
Naphthalene-d8 % recovery**	%	TM218		95	95.7	96	95.5	92.8
Acenaphthene-d10 % recovery**	%	TM218		94.7	95.2	98.6	97.8	93.1
Phenanthrene-d10 % recovery**	%	TM218		93.4	93.5	96.6	96	91.2
Chrysene-d12 % recovery**	%	TM218		94.5	94.3	95.9	95	90.2
Perylene-d12 % recovery**	%	TM218		91	92	96.2	95.1	89.5
Naphthalene	<9 µg/kg	TM218		70.3 M	134 M	120 M	107 M	45.8 M
Acenaphthylene	<12 µg/kg	TM218		<12 M	14.3 M	20.8 M	74.3 M	<12 M
Acenaphthene	<8 µg/kg	TM218		<8 M	9.59 M	9.98 M	23.9 M	<8 M
Fluorene	<10 µg/kg	TM218		11.8 M	12.7 M	<10 M	48.2 M	<10 M
Phenanthrene	<15 µg/kg	TM218		263 M	388 M	390 M	941 M	169 M
Anthracene	<16 µg/kg	TM218		32.5 M	44.8 M	54.9 M	154 M	37.9 M
Fluoranthene	<17 µg/kg	TM218		186 M	315 M	343 M	1240 M	97.8 M
Pyrene	<15 µg/kg	TM218		162 M	251 M	287 M	931 M	83.3 M
Benz(a)anthracene	<14 µg/kg	TM218		110 M	175 M	206 M	609 M	63.1 M
Chrysene	<10 µg/kg	TM218		114 M	174 M	188 M	519 M	65.3 M
Benzo(b)fluoranthene	<15 µg/kg	TM218		150 M	260 M	318 M	719 M	84.9 M
Benzo(k)fluoranthene	<14 µg/kg	TM218		47.9 M	77.4 M	72.4 M	221 M	22.9 M
Benzo(a)pyrene	<15 µg/kg	TM218		89.8 M	151 M	172 M	493 M	49.8 M
Indeno(1,2,3-cd)pyrene	<18 µg/kg	TM218		62.2 M	107 M	120 M	251 M	31 M
Dibenzo(a,h)anthracene	<23 µg/kg	TM218		<23 M	33.3 M	42 M	78.9 M	<23 M
Benzo(g,h,i)perylene	<24 µg/kg	TM218		131 M	205 M	211 M	348 M	58.5 M
PAH, Total Detected USEPA 16	<118 µg/kg	TM218		1430	2350	2550	6760	809

CERTIFICATE OF ANALYSIS

SDG:	110622-95	**Location:**	Stagborough	**Order Number:**	
Job:	H_GRONTMIJ_SOL-27	**Customer:**	Grontmij	**Report Number:**	138581
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

PAH Spec MS - Aqueous (W)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Non-conforming work.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	SW01	SW02	SW03			
			Depth (m)	.	.	.			
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)			
			Date Sampled	20/06/2011	20/06/2011	20/06/2011			
			Date Received	22/06/2011	22/06/2011	22/06/2011			
			SDG Ref	110622-95	110622-95	110622-95			
			Lab Sample No.(s)	3724072	3724073	3724074			
			AGS Reference						
Naphthalene (aq)	<0.1 µg/l	TM178		<0.1 #	<0.1 #	0.114 #			
Acenaphthene (aq)	<0.015 µg/l	TM178		<0.015 #	<0.015 #	<0.015 #			
Acenaphthylene (aq)	<0.011 µg/l	TM178		<0.011 #	<0.011 #	<0.011 #			
Fluoranthene (aq)	<0.017 µg/l	TM178		0.0548 #	0.0191 #	<0.017 #			
Anthracene (aq)	<0.015 µg/l	TM178		<0.015 #	<0.015 #	<0.015 #			
Phenanthrene (aq)	<0.022 µg/l	TM178		<0.022 #	<0.022 #	<0.022 #			
Fluorene (aq)	<0.014 µg/l	TM178		<0.014 #	<0.014 #	<0.014 #			
Chrysene (aq)	<0.013 µg/l	TM178		0.0515 #	0.0203 #	<0.013 #			
Pyrene (aq)	<0.015 µg/l	TM178		0.0593 #	0.018 #	<0.015 #			
Benzo(a)anthracene (aq)	<0.017 µg/l	TM178		0.0429 #	0.0226 #	<0.017 #			
Benzo(b)fluoranthene (aq)	<0.023 µg/l	TM178		0.0296 #	<0.023 #	<0.023 #			
Benzo(k)fluoranthene (aq)	<0.027 µg/l	TM178		0.0368 #	<0.027 #	<0.027 #			
Benzo(a)pyrene (aq)	<0.009 µg/l	TM178		0.0332 #	<0.009 #	<0.009 #			
Dibenzo(a,h)anthracene (aq)	<0.016 µg/l	TM178		<0.016 #	<0.016 #	<0.016 #			
Benzo(g,h,i)perylene (aq)	<0.016 µg/l	TM178		0.0226 #	<0.016 #	<0.016 #			
Indeno(1,2,3-cd)pyrene (aq)	<0.014 µg/l	TM178		0.0198 #	<0.014 #	<0.014 #			
PAH, Total Detected USEPA 16 (aq)	µg/l	TM178		0.35	0.08	0.114			

CERTIFICATE OF ANALYSIS

SDG:	110622-95	**Location:**	Stagborough	**Order Number:**	
Job:	H_GRONTMIJ_SOL-27	**Customer:**	Grontmij	**Report Number:**	138581
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

Table of Results - Appendix

REPORT KEY

Results expressed as (e.g.) 1.03E-07 is equivalent to 1.03x10-7

NDP	No Determination Possible	#	ISO 17025 Accredited	*	Subcontracted Test	M	MCERTS Accredited
NFD	No Fibres Detected	PFD	Possible Fibres Detected	»	Result previously reported (Incremental reports only)	EC	Equivalent Carbon (Aromatics C8-C35)

Note: Method detection limits are not always achievable due to various circumstances beyond our control

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
PM001		Preparation of Samples for Metals Analysis		
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material		
TM001	In - house Method	Determination of asbestos containing material by screening on solids		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters		
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM218	Microwave extraction – EPA method 3546	Microwave extraction - EPA method 3546		
TM228	US EPA Method 6010B	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES		

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

CERTIFICATE OF ANALYSIS

SDG:	110622-95	**Location:**	Stagborough	**Order Number:**	
Job:	H_GRONTMIJ_SOL-27	**Customer:**	Grontmij	**Report Number:**	138581
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	3724065	3724067	3724068	3724069	3724070	3724072	3724073	3724074
Customer Sample Ref.	S01	S02	S03	S04	S05	SW01	SW02	SW03
AGS Ref.								
Depth	0.50	0.20	0.10	0.10	0.40			
Type	SOLID	SOLID	SOLID	SOLID	SOLID	LIQUID	LIQUID	LIQUID
Asbestos Containing Material Screen	07-Jul-2011	07-Jul-2011	07-Jul-2011	07-Jul-2011	07-Jul-2011			
Dissolved Metals by ICP-MS						04-Jul-2011	04-Jul-2011	04-Jul-2011
Mercury Dissolved						05-Jul-2011	05-Jul-2011	05-Jul-2011
Metals by iCap-OES (Soil)	08-Jul-2011	08-Jul-2011	08-Jul-2011	08-Jul-2011	08-Jul-2011			
Metals by iCap-OES Dissolved (W)						04-Jul-2011	04-Jul-2011	04-Jul-2011
PAH by GCMS	09-Jul-2011	09-Jul-2011	09-Jul-2011	09-Jul-2011	09-Jul-2011			
PAH Spec MS - Aqueous (W)						07-Jul-2011	07-Jul-2011	07-Jul-2011
Sample description	01-Jul-2011	01-Jul-2011	01-Jul-2011	01-Jul-2011	01-Jul-2011			

SDG:	110622-95	**Location:**	Stagborough	**Order Number:**	
Job:	H_GRONTMIJ_SOL-27	**Customer:**	Grontmij	**Report Number:**	138581
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

Appendix

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH4 by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.

7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample -similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP -No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.

11. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.

14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors
employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials -whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute themajor part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 -C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
SOLVENT EXTRACTABLE MATTER	D&C	DCM	SOXTHERM	GRAVIMETRIC
CYCLOHEXANE EXT. MATTER	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
THIN LAYER CHROMATOGRAPHY	D&C	DCM	SOXTHERM	IATROSCAN
ELEMENTAL SULPHUR	D&C	DCM	SOXTHERM	HPLC
PHENOLS BY GCMS	WET	DCM	SOXTHERM	GCMS
HERBICIDES	D&C	HEXANE/ACETONE	SOXTHERM	GCMS
PESTICIDES	D&C	HEXANE/ACETONE	SOXTHERM	GCMS
EPH (DRO)	D&C	HEXANE/ACETONE	END OVER END	GCFID
EPH (MIN OIL)	D&C	HEXANE/ACETONE	END OVER END	GCFID
EPH (CLEANED UP)	D&C	HEXANE/ACETONE	END OVER END	GCFID
EPH CWG BY GC	D&C	HEXANE/ACETONE	END OVER END	GCFID
PCB TOT / PCB CON	D&C	HEXANE/ACETONE	END OVER END	GCMS
POLYAROMATIC HYDROCARBONS (MS)	WET	HEXANE/ACETONE	MICROWAVE TM218.	GCMS
C8-C40 (C8-C40) EZ FLASH	WET	HEXANE/ACETONE	SHAKER	GCEZ
POLYAROMATIC HYDROCARBONS RAPID GC	WET	HEXANE/ACETONE	SHAKER	GCEZ
SEMI VOLATILE ORGANIC COMPOUNDS	WET	DCM/ACETONE	SONICATE	GCMS

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH/MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GCMS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GCMS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GCMS
SVOC	DCM	LIQUID/LIQUID SHAKE	GCMS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM	LIQUID/LIQUID SHAKE	GCMS
TRIAZINE HERBS	DCM	LIQUID/LIQUID SHAKE	GCMS
PHENOLS/MS	DCM	SOLID PHASE EXTRACTION	GCMS
TPH by INFRARED (IR)	TCE	LIQUID/LIQUID SHAKE	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID SHAKE	HPLC
GLYCOLS	NONE	DIRECT INJECTION	GCMS

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials or those identified as potentially asbestos containing during sample description which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -
Trace -Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

APPENDIX E

TABLE 1 - GAS MONITORING DATA

Site: *Stagborough* **Job No.**

Monitoring Well Sampling & Testing Record

BH	Date	Pipe Internal Diameter mm	Monitored By	Gas Rel. Pressure	Flow l/h	CH_4 % v/v	CH_4 GSV	CO_2 % v/v	CO_2 GSV	O_2 % v/v	CO ppm	H2S ppm	PID CF ppm	HEX %	LEL %	Gas Analyser	Weather Atmospheric Pressure mbar
BH01	12/10/2010		MJH	0.58	-0.1	0	0	3.8	-0.0038	15.2	0	0	NM	NM	0	GA2000 +Flow pod	1003
BH01	26/10/2010		GVT	NM	0	0	0	0.7	0	14.5	0	0	NM	NM	0	GA2000 +Flow pod	997
BH01	09/11/2010		MJH	NM	0.1	0	0	2.4	0.0024	19.2	0	0	NM	NM	0	GA2000 +Flow pod	NM
BH01	23/11/2010		MJH	NM	0.2	0	0	2	0.004	18.8	0	0	NM	NM	0	GA2000 +Flow pod	NM
BH02	12/10/2010		MJH	0.42	0.1	0	0	3.8	0.0038	13.2	0	0	NM	NM	0	GA2000 +Flow pod	1003
BH02	26/10/2010		GVT	NM	-0.1	1.8	-0.0018	10.7	-0.0107	1	0	0	NM	NM	0	GA2000 +Flow pod	996
BH02	09/11/2010		MJH	NM	0.1	0	0	2.7	0.0027	17.4	0	0	NM	NM	0	GA2000 +Flow pod	NM
BH02	23/11/2010		MJH	NM	0.1	0	0	1.4	0.0014	17.6	0	0	NM	NM	0	GA2000 +Flow pod	NM
BH02	31/05/2011		RJH	0	0.1	0.7	0.0007	10	0.01	0.4	0	-10	1.5	0.101	37.6	GFM43S	1011
BH02	20/06/2011		RJH	0	0	-0.1	0	3	0	16.7	2	0	0.9	0		GFM43S	999
BH02	01/07/2011		RJH		0	0	0	11.5	0	0	0	0	1	0.001		GFM43S	1014
BH02	15/07/2011		RJH	0	0	1	0	11.4	0	0.3	0	0	1.5	0.078	34.2	GFM436	1003
BH03	12/10/2010		MJH	0.38	0.1	0	0	4.1	0.0041	13.2	0	0	NM	NM	0	GA2000 +Flow pod	1003
BH03	26/10/2010		GVT	NM	0.2	0	0	0.6	0.0012	15.9	0	0	NM	NM	0	GA2000 +Flow pod	997
BH03	09/11/2010		MJH	NM	-0.1	0	0	2.6	-0.0026	17.9	0	0	NM	NM	0	GA2000 +Flow pod	NM
BH03	23/11/2010		MJH	NM	0.2	0	0	2.2	0.0044	17.9	0	0	NM	NM	0	GA2000 +Flow pod	NM
WS01	12/10/2010		MJH	0.37	0.1	0	0	3.8	0.0038	14.4	0	0	NM	NM	0	GA2000 +Flow pod	1003
WS01	26/10/2010		GVT	NM	-0.1	0	0	0.2	-0.0002	16.4	0	0	NM	NM	0	GA2000 +Flow pod	997
WS01	09/11/2010		MJH	NM	0.1	0	0	2.8	0.0028	17.6	0	0	NM	NM	0	GA2000 +Flow pod	NM
WS01	23/11/2010		MJH	NM	-0.1	0	0	2.9	-0.0029	16.9	0	0	NM	NM	0	GA2000 +Flow pod	NM
WS02	12/10/2010		MJH	0.60	0.1	0	0	1.6	0.0016	14.6	0	0	NM	NM	0	GA2000 +Flow pod	1001
WS02	26/10/2010		GVT	NM	0.1	0	0	3.5	0.0035	14.1	0	0	NM	NM	0	GA2000 +Flow pod	997
WS02	09/11/2010		MJH	NM	0.1	0	0	2.8	0.0028	18.9	0	0	NM	NM	0	GA2000 +Flow pod	NM
WS02	23/11/2010		MJH	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	GA2000 +Flow pod	NM
WS03	12/10/2010		MJH	0.56	0.1	0	0	1.9	0.0019	14.4	0	0	NM	NM	0	GA2000 +Flow pod	1001
WS03	26/10/2010		GVT	NM	0	0	0	2.4	0	15.4	0	0	NM	NM	0	GA2000 +Flow pod	997
WS03	09/11/2010		MJH	NM	0	0	0	3.1	0	14.2	0	0	NM	NM	0	GA2000 +Flow pod	NM
WS03	23/11/2010		MJH	NM	0.2	0	0	1.8	0.0036	18.7	0	0	NM	NM	0	GA2000 +Flow pod	NM
WS04	12/10/2010		MJH	0.44	0.1	0	0	2.2	0.0022	13.5	0	0	NM	NM	0	GA2000 +Flow pod	1002
WS04	26/10/2010		GVT	NM	0	0	0	1.1	0	15.4	0	0	NM	NM	0	GA2000 +Flow pod	996
WS04	09/11/2010		MJH	NM	0.1	0	0	2.9	0.0029	17.8	0	0	NM	NM	0	GA2000 +Flow pod	NM
WS04	23/11/2010		MJH	NM	0.1	0	0	2.6	0.0026	18.0	0	0	NM	NM	0	GA2000 +Flow pod	NM
	WS5 = 73 stagboro																
WS05	12/10/2010		MJH	0.38	-0.1	0	0	1.4	-0.0014	14.1	0	0	NM	NM	0	GA2000 +Flow pod	1001
WS05	26/10/2010		GVT	NM	0	0	0	8.8	0	3.7	0	0	NM	NM	0	GA2000 +Flow pod	997
WS05	09/11/2010		MJH	NM	0.1	0	0	7.8	0.0078	8.1	0	0	NM	NM	0	GA2000 +Flow pod	NM
WS05	23/11/2010		MJH	NM	0.1	0	0	2.1	0.0021	18.3	0	0	NM	NM	0	GA2000 +Flow pod	NM
WS05	31/05/2011		RJH	0.00	0.1	-0.4	-0.0004	5.5	0.0055	10.5	-1	-10	0.8	0	0	GFM43S	1010
WS05	20/06/2011		RJH	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM		
WS05	01/07/2011		RJH	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM		1014
WS05	15/07/2011		RJH	0.00	0.00	-0.30	0.00	7.30	0.00	12.10	0.00	0.00	0.80	0.00	0.00	GFM43S	1004
WS06	12/10/2010		MJH	0.60	-0.1	0	0	4	-0.004	15.7	0	0	NM	NM	0	GA2000 +Flow pod	1002
WS06	26/10/2010		GVT	NM	0.2	0	0	2	0.004	15.4	0	0	NM	NM	0	GA2000 +Flow pod	997
WS06	09/11/2010		MJH	NM	0.1	0	0	1.3	0.0013	17.8	0	0	NM	NM	0	GA2000 +Flow pod	NM
WS06	23/11/2010		MJH	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	GA2000 +Flow pod	NM
WS07	12/10/2010		MJH	0.38	-0.1	0	0	1.7	-0.0017	15.0	0	0	NM	NM	0	GA2000 +Flow pod	1003
WS07	26/10/2010		GVT	NM	-0.3	0	0	4.3	-0.0129	13.9	0	0	NM	NM	0	GA2000 +Flow pod	997
WS07	09/11/2010		MJH	NM	0.1	0	0	3	0.003	16.3	0	0	NM	NM	0	GA2000 +Flow pod	NM
WS07	23/11/2010		MJH	NM	0.1	0	0	2.2	0.0022	18.0	0	0	NM	NM	0	GA2000 +Flow pod	
WS08	12/10/2010		MJH	0.60	0.1	0	0	3	0.003	14.3	0	0	NM	NM	0	GA2000 +Flow pod	1001
WS08	26/10/2010		GVT	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
WS08	09/11/2010		MJH	NM	0.1	0	0	3.1	0.0031	19.1	0	0	NM	NM	0	GA2000 +Flow pod	NM
WS08	23/11/2010		MJH	NM	0.1	0	0	2.8	0.0028	18.3	0	0	NM	NM	0	GA2000 +Flow pod	NM
	WS9 = 41 Swallowfids																
WS09	12/10/2010		MJH	0.38	0.4	0	0	4.6	0.0184	13.6	0	0	NM	NM	0	GA2000 +Flow pod	1003
WS09	26/10/2010		GVT	NM	-0.3	0	0	6.2	-0.0186	13.7	0	0	NM	NM	0	GA2000 +Flow pod	997
WS09	09/11/2010		MJH	NM	0.01	0	0	3.5	0.00035	18.5	0	0	NM	0	0	GA2000 +Flow pod	NM
WS09	23/11/2010		MJH	NM	0.1	0	0	2.8	0.0028	16.7	0	0	NM	NM	0	GA2000 +Flow pod	NM
WS09	31/05/2011		RJH	0.00	0	-0.2		1.4		18.2	1	-10	0.9	0	0	GFM43S	1011
WS09	20/06/2011		RJH	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM		
WS09	01/07/2011		RJH	0.00	0.00	-0.10	0.00	2.90	0.00	18.00	0.00	-10.00	0.90	0.00	0.00	GFM43S	1014
WS09	15/07/2011		RJH	0.00	0.00	-0.10	0.00	2.70	0.00	18.70	0.00	0.00	0.90	0.00	0.00	GFM43S	1004
WS10	12/10/2010		MJH	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	GA2000 +Flow pod	NM
WS10	26/10/2010		GVT	NM	0	0	0	1.3	0	16.1	0	0	NM	NM	0	GA2000 +Flow pod	997
WS10	09/11/2010		MJH	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	GA2000 +Flow pod	NM
WS10	23/11/2010		MJH	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	GA2000 +Flow pod	NM
WS11	12/10/2010		MJH	0.40	0.1	0	0	2.7	0.0027	12.1	0	0	NM	NM	0	GA2000 +Flow pod	1003
WS11	26/10/2010		GVT	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
WS11	09/11/2010		MJH	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
WS11	23/11/2010		MJH	NM	0.1	0	0	1.3	0.0013	17.8	0	0	NM	NM	0	GA2000 +Flow pod	NM
WS12	12/10/2010		MJH	0.58	0.1	0	0	2	0.002	14.2	0	0	NM	NM	0	GA2000 +Flow pod	1001
WS12	26/10/2010		GVT	NM	-0.2	0	0	0.2	-0.0004	16.6	0	0	NM	NM	0	GA2000 +Flow pod	997
WS12	09/11/2010		MJH	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	GA2000 +Flow pod	NM
WS12	23/11/2010		MJH	NM	0.1	0	0	2.9	0.0029	17.6	0	0	NM	NM	0	GA2000 +Flow pod	NM
WS13A	12/10/2010		MJH	0.58	0.1	0	0	3.2	0.0032	13.1	0	0	NM	NM	0	GA2000 +Flow pod	1002
WS13A	26/10/2010		GVT	NM	0	0	0	3	0	15.1	0	0	NM	NM	0	GA2000 +Flow pod	997
WS13A	09/11/2010		MJH	NM	0.1	0	0	1.3	0.0013	19.2	0	0	NM	NM	0	GA2000 +Flow pod	NM
WS13A	23/11/2010		MJH	NM	0.1	0	0	2.8	0.0028	18.8	0	0	NM	NM	0	GA2000 +Flow pod	NM
WS14	12/10/2010		MJH	0.59	-0.1	0	0	1.8	-0.0018	14.4	0	0	NM	NM	0	GA2000 +Flow pod	1001
WS14	26/10/2010		GVT	NM	-0.1	0	0	2.9	-0.0029	14.5	0	0	NM	NM	0	GA2000 +Flow pod	997
WS14	09/11/2010		MJH	NM	-0.1	0	0	1.4	-0.0014	14.4	0	0	NM	NM	0	GA2000 +Flow pod	NM
WS14	23/11/2010		MJH	NM	0.1	0.2	0.0002	2.6	0.0026	18.5	0	0	NM	NM	8.1	GA2000 +Flow pod	NM
WS15	12/10/2010		MJH	0.38	0.1	0	0	4.4	0.0044	11.7	0	0	NM	NM	0	GA2000 +Flow pod	1003
WS15	26/10/2010		GVT	NM	-0.1	0	0	1.3	-0.0013	15.8	0	0	NM	NM	0	GA2000 +Flow pod	997
WS15	09/11/2010		MJH	NM	0.01	0	0	2	0.0002	19.8	0	0	NM	NM	0	GA2000 +Flow pod	NM
WS15	23/11/2010		MJH	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	GA2000 +Flow pod	NM
WS16	12/10/2010		MJH	0.60	0.1	0	0	1.8	0.0018	13.4	0	0	NM	NM	0	GA2000 +Flow pod	1001
WS16	26/10/2010		GVT	NM	0	0	0	2.9	0	14.5	0	0	NM	NM	0	GA2000 +Flow pod	997
WS16	09/11/2010		MJH	NM	-0.1	0	0	1.6	-0.0016	18.3	0	0	NM	NM	0	GA2000 +Flow pod	NM
WS16	23/11/2010		MJH	NM	0.2	0	0	1.8	0.0036	19.0	0	0	NM	NM	0	GA2000 +Flow pod	NM

APPENDIX F

Appendix F: Severity and Probability of Risk in Conceptual Site Models (after CIRIA552, Tables 6.3 to 6.5)

This report draws on guidance presented in CIRIA report 552, "Contaminated Land Risk Assessment, A Guide for Good Practice", wherein the "severity" term in the Conceptual Site Model is classified with reference to the sensitivity of the hazard and the receptor, as follows:

Severity Category	Description	Examples
Severe	Acute risk to human health likely to result in "significant harm" as defined in EPA90, catastrophic damage to buildings or property, acute risk of major pollution of controlled waters, acute risk of harm to ecosystems (as defined in Contaminated Land Regulations 2006)	High cyanide concentrations at the surface of a recreation area Major spillage into controlled waters Explosion, causing building collapse
Medium	Chronic risk to human health likely to result in "significant harm" as defined in EPA90, chronic pollution of sensitive controlled waters, significant change at a sensitive ecosystems or species, significant damage to buildings or structures	Contaminant concentrations at a site in excess of SGVs, GAC or similar screening values Leaching of contaminants to sensitive aquifer Death of a species within a nature reserve
Mild	Pollution of non-sensitive waters, significant damage to buildings, structures, services or crops, damage to sensitive buildings, structures, services or the environment, which nonetheless result in "significant harm"	Pollution to (former) non-aquifer or to non-controlled surface watercourse. Damage to building rendering it unsafe to occupy (e.g. foundation or structural damage)
Minor	Harm, not necessarily resulting in "significant harm" but probably requiring expenditure to resolve or financial loss. Non-permanent risks to human health that are easily mitigated, e.g. by wearing PPE. Easily-repairable damage to structures or services	Contaminant concentrations requiring the wearing of PPE during site work, but no other long-term mitigation. Discolouration of concrete

The likelihood of an event (probability) takes into account both the presence of hazard and receptor and the integrity of the pathway between hazard and receptor, and is assessed as follows:

Category	There is a pollution linkage and:
High	Event is likely in the short term and almost inevitable over the long term. Or, there is evidence of actual harm at/to the receptor
Likely	Event is possible in the short term and likely over the long term
Low	Event is unlikely in the short term and possible over the long term
Unlikely	Event is unlikely, even in the long term

Potential severity and probability have been assessed in the following matrix, to give an overall risk rating:

	Severity			
Probability	Severe	Medium	Mild	Minor
High	Very high	High	Moderate	Low/moderate
Likely	High	Moderate	Low/moderate	Low
Low	Moderate	Low/moderate	Low	Very low
Unlikely	Low/moderate	Low	Very low	Very low

The above risk categories are likely to result in the following actions:

- Very high: urgent intervention / investigation needed, remediation likely to be required
- High: urgent intervention / investigation needed, remediation possibly required in short term and probably required in long term
- Moderate: investigation needed to clarify and refine risk; remediation may be required over the long term
- Low: it is possible that harm could arise to a receptor, but if realised, such harm is likely to be, at worst, mild
- Very low: it is possible that harm could arise to a receptor, but if realised, such harm is unlikely to be severe

APPENDIX G

Appendix G – Tier 1 Screen for Protection of Water Pipes

Two publications were reviewed in regard to potential risks to water supply pipes posed by contaminants in the ground:

- "Guidance for the Protection of Water Supply Pipes to be Used in Brownfield Sites" (UK Water Industry Research {UKWIR}, ref 10/WM/03/21, 2010 (re-issued version))
- The Selection of Materials for Water Supply Pipes to be Laid in Contaminated Land (Water Regulations Advisory Scheme {WRAS}, ref 9-04-03, October 2002)

Both reports present methodologies for the assessment of soil conditions and the specification of appropriate pipework materials to mitigate the presence of contaminants.

WRAS Screen

A comparison between the chemical analysis results obtained from samples taken from the top 1.2m of soil at the site and the older WRAS screening values is presented in the table below. Only soils from the top 1.2m of the soil profile have been selected for comparison as 1.2m is the typical maximum depth at which water pipes are laid within the highway – with local service connections to properties typically much shallower. Note, the table below does not constitute a full screen against all WRAS parameters; e.g. sulphate and coal tar have not been tested for.

WRAS Threshold Screen

Analyte	Test Result (mg/kg)		WRAS Threshold Value (mg/kg)
	Maximum	Mean (where max>threshold))	
Sulphate	Not analysed	-	2000
Sulphur	Not analysed	-	5000
Sulphide	Not analysed	-	250
pH	5.21 – **8.63**	7.26	<5 or **>8**
Antimony	<0.6		10
Arsenic	**25**	8.99	**10**
Cadmium	2.9	-	3
Chromium (hexavalent)	<1.2	-	25
Chromium (total)	32	-	600
Cyanide (free)	Not analysed	-	25
Cyanide (complexed)	<1 (total CN)	-	250
Lead	130	-	500
Mercury	0.6	-	1
Selenium	2.0	-	3
Thiocyanate	<1	-	50
Coal Tar	Not analysed	-	50
Cyclohexane extractable	Not analysed	-	50
Phenol	0.42	-	5
Polyaromatic Hydrocarbons	**160**	13	**50**
Toluene extractable	0.69	-	50
Petroleum Hydrocarbons	**1210**	**260**	**50**

Bold values denote exceedance of WRAS threshold value

The maximum concentrations of arsenic, polyaromatic hydrocarbons and petroleum hydrocarbons, and the maximum soil pH level recorded, exceed the WRAS threshold values. The mean concentration of petroleum hydrocarbons recorded also exceeds the WRAS threshold value.

UKWIR Screen

The UKWIR approach is the most recent and reflects further studies undertaken since the WRAS document was published in 2002. Key features of the UKWIR report include:

- A pipework material-specific assessment procedure (Table 3.1 of the report). This allows chemical analysis results to be compared to various threshold criteria associated with six possible pipework material types
- The discounting of metallic pipework (other than copper or steel/ductile iron with protective wrapping) as a modern pipework material
- The specification of a different chemical testing suite to that recommended in the earlier WRAS document – including the use of physio-chemical parameters and exclusion of analysis for metals (given the above discounting of metallic pipework).

The chemical analysis for the site was scheduled prior to the publication of the re-issued UKWIR report (despite a re-issue data of 2010, the report was not available until January 2011). Therefore, some of the parameters required for a UKWIR screen (as summarised in Appendix G) are not available. The available laboratory results from the top 1.2m of soil have been compared to the UKWIR thresholds. The screen indicates that:

- The total VOC (minus BTEX) and total SVOC (minus phenols and cresols) concentrations exceed PE and PVC pipe limits
- BTEX concentrations are generally acceptable for PE pipe with the exception of BH02, but not for PVC pipe
- The mineral oil C11-20 result are acceptable for PE pipework
- Concentrations of mineral oil C21-40 are acceptable for PE pipework.

Summary

The above Tier 1 screen indicates that It is possible that the concentrations of contaminants at the site could adversely effect drinking water quality, depending on the materials used for water distribution (South Staffordshire Water pipes) and local connections to the South Staffordshire Water network (probably installed by the house builder). However, it is generally recognised that the adopted screening values are deliberately set at low concentrations, to provide a precautionary approach.

Further assessment of the potential risk posed by soil contaminants to drinking water quality is discussed in Section 3.2.6.

APPENDIX H

Grontmij

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No. 2888385

Memo

Date
20 September 2011

Our Reference
R817/103912/V1/2011

To
Cannock Chase District Council

Project Number
103912

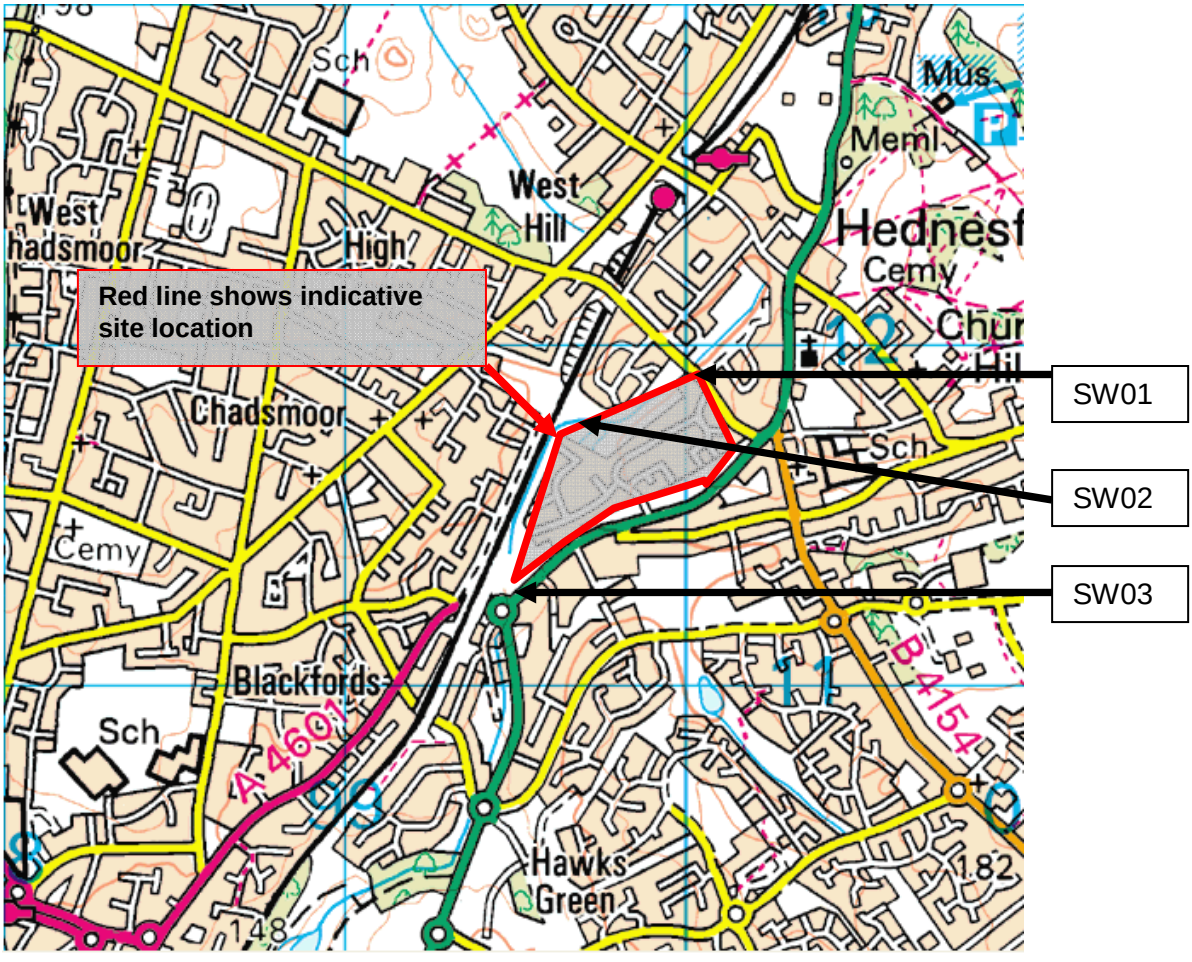
From
Grontmij

Subject
Stagborough Way

Dear Karen,

Further to our report reference R766/103912/V2/2011 we write to present the results of the additional Surface water monitoring undertaken at Stagborough Way.

Three samples were obtained from the brook by means of grab sampling. The second round of samples was obtained from SW01 to SW03 as per previous monitoring, it should be noted that the water level was significantly higher during the second round of monitoring. Sample locations are shown below:



The first monitoring round identified a minor exceedance of Total Chromium (1.3%) in one of the water samples obtained. While unlikely to be of significance with respect to contaminated land thresholds, this second round of monitoring was undertaken to provide additional confidence in this assessment.

The three water samples were submitted to Alcontrol of Hawarden for chemical analysis for Total Chromium only as detailed in report reference R766/103912/V2/2011.

The results of the analyses are summarised in the Table below, along with a comparison to the most stringent Tier 1 screening values published in the Water Framework Directive Directions 2010 or UK Environmental Quality Standards protective of surface water quality and previous monitoring results.

Sampling round	**Contaminant**	**SW01** (µg/l)	**SW02** (µg/l)	**SW03** (µg/l)	**WFD or EQS Tier 1 Screening Value** (µg/l)	**Samples >Tier 1 Screening Value**
1	Chromium (diss.filt)	5.7	4.5	7.3	7.2	SW03
2	Chromium (diss.filt)	2.3	2.5	3.0	7.2	-

The only Tier 1 screening value exceeded was within sample SW03 in the first sampling round. That concentration of chromium was only marginally in excess of the adopted screening value (by 0.1ug/l). No exceedances of Total Chromium were encountered in any of the samples obtained during monitoring round two, therefore Grontmij do not consider that these results demonstrate that pollution of controlled waters is being caused by virtue of contaminants beneath the site, nor that contaminants beneath the site pose a SPOSH to controlled waters. No further surface water monitoring is therefore recommended at this stage.

Rebecca Hearn
Assistant Consultant

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Radcliffe House
3rd Floor
Blenheim Court, Lode lane
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West Midlands
B912AA

Attention: Gareth Taylor

CERTIFICATE OF ANALYSIS

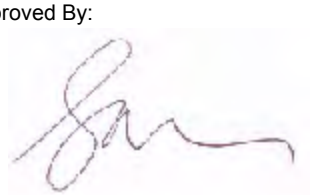
Date:	14 September 2011
Customer:	H_GRONTMIJ_SOL
Sample Delivery Group (SDG):	110907-61
Your Reference:	
Location:	Stagborough
Report No:	150052

We received 3 samples on Wednesday September 07, 2011 and 3 of these samples were scheduled for analysis which was completed on Wednesday September 14, 2011. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	110907-61	**Location:**	Stagborough	**Order Number:**	
Job:	H_GRONTMIJ_SOL-27	**Customer:**	Grontmij	**Report Number:**	150052
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
4244580	SW01			06/09/2011
4244581	SW02			06/09/2011
4244583	SW03			06/09/2011

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

SDG:	110907-61	**Location:**	Stagborough	**Order Number:**	
Job:	H_GRONTMIJ_SOL-27	**Customer:**	Grontmij	**Report Number:**	150052
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

LIQUID

Results Legend

X Test

N No Determination Possible

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			4244580	SW01			1plastic (ALE221)
			4244581	SW02			1plastic (ALE221)
			4244583	SW03			1plastic (ALE221)
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 3	X	X	X		

CERTIFICATE OF ANALYSIS

SDG:	110907-61	**Location:**	Stagborough	**Order Number:**	
Job:	H_GRONTMIJ_SOL-27	**Customer:**	Grontmij	**Report Number:**	150052
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	SW01	SW02	SW03			
			Depth (m)	.	.	.			
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)			
			Date Sampled	06/09/2011	06/09/2011	06/09/2011			
			Date Received	07/09/2011	07/09/2011	07/09/2011			
			SDG Ref	110907-61	110907-61	110907-61			
			Lab Sample No.(s)	4244580	4244581	4244583			
			AGS Reference						
Chromium (diss.filt)	<0.22 µg/l	TM152		2.26 #	2.52 #	2.97 #			

CERTIFICATE OF ANALYSIS

SDG:	110907-61	**Location:**	Stagborough	**Order Number:**	
Job:	H_GRONTMIJ_SOL-27	**Customer:**	Grontmij	**Report Number:**	150052
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

Table of Results - Appendix

REPORT KEY

Results expressed as (e.g.) 1.03E-07 is equivalent to 1.03x10-7

NDP	No Determination Possible	#	ISO 17025 Accredited	*	Subcontracted Test	M	MCERTS Accredited
NFD	No Fibres Detected	PFD	Possible Fibres Detected	»	Result previously reported (Incremental reports only)	EC	Equivalent Carbon (Aromatics C8-C35)

Note: Method detection limits are not always achievable due to various circumstances beyond our control

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

CERTIFICATE OF ANALYSIS

SDG:	110907-61	**Location:**	Stagborough	**Order Number:**	
Job:	H_GRONTMIJ_SOL-27	**Customer:**	Grontmij	**Report Number:**	150052
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	4244580	4244581	4244583
Customer Sample Ref.	SW01	SW02	SW03
AGS Ref.			
Depth			
Type	LIQUID	LIQUID	LIQUID
Dissolved Metals by ICP-MS	14-Sep-2011	14-Sep-2011	14-Sep-2011

SDG:	110907-61	**Location:**	Stagborough	**Order Number:**	
Job:	H_GRONTMIJ_SOL-27	**Customer:**	Grontmij	**Report Number:**	150052
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

Appendix

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH4 by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.

7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample -similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP -No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.

11. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.

14. **Product analyses** -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors
employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials -whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute themajor part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 -C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
SOLVENT EXTRACTABLE MATTER	D&C	DCM	SOXTHERM	GRAVIMETRIC
CYCLOHEXANE EXT. MATTER	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
ELEMENTAL SULPHUR	D&C	DCM	SOXTHERM	HPLC
PHENOLS BY GCMS	WET	DCM	SOXTHERM	GC-MS
HERBICIDES	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
PESTICIDES	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (MIN OIL)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (CLEANED UP)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG BY GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB TOT / PCB CON	D&C	HEXANE:ACETONE	END OVER END	GC-MS
POLYAROMATIC HYDROCARBONS (MS)	WET	HEXANE:ACETONE	MICROWAVE TM218.	GC-MS
C8-C40 (C8-C40) EZ FLASH	WET	HEXANE:ACETONE	SHAKER	GC-EZ
POLYAROMATIC HYDROCARBONS RAPID GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
SEMI VOLATILE ORGANIC COMPOUNDS	WET	DCM:ACETONE	SONICATE	GC-MS

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
SVOC	DCM	LIQUID/LIQUID SHAKE	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM	LIQUID/LIQUID SHAKE	GC MS
TRIAZINE HERBS	DCM	LIQUID/LIQUID SHAKE	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRARED (IR)	TCE	LIQUID/LIQUID SHAKE	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID SHAKE	HPLC
GLYCOLS	NONE	DIRECT INJECTION	GC MS

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials or those identified as potentially asbestos containing during sample description which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -
Trace -Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.