Cannock Chase District Council

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

Infilled Land at Armitage Road, Rugeley, Staffordshire

July 2011

Prepared for:

Cannock Chase Council
PO Box 28
Beecroft Road
Cannock
Staffordshire
WS11 1BG

Prepared by:
Grontmij Limited
3rd Floor, Radcliffe House
Blenheim Court
Lode Lane
Solihull
B91 2AA

T 0121 7116600
F 0121 7116749
E gareth.taylor@grontmij.co.uk

Document Control

Report Reference	Issue Date	Reason for Issue	Prepared by		Checked by	Approved by
R618/106270/V1 /2011	08/04/2011	First Issue	**Name**	Rebecca Hearn	Gareth Taylor	Colin Macdonald
			Position	Assistant Environmental Consultant	Principal Environmental Consultant	Director, Land Quality
R618/106270/V2 /2011	01/07/11	Updated with tap water sampling results	Name	Rebecca Hearn	Gareth Taylor	Colin Macdonald
			Position	Assistant Environmental Consultant	Principal Environmental Consultant	Director, Land Quality

CONTENTS

FIGURES

TABLES

DRAWINGS

Drawing 1: Exploratory Hole Location Plan

APPENDICES

Appendix A	Initial Desktop Study and Site Walkover Report, January 2010
Appendix B	Limitations Statement
Appendix C	Exploratory Hole Logs
Appendix D	Chemical Analysis Results
Appendix E	Gas Monitoring Data
Appendix F	Severity and Probability of Risk (after CIRIA 552)

1 INTRODUCTION

1.1 Terms of Reference

In August 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 assisted 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 on Armitage Road, Rugeley, Staffordshire (hereafter referred to as 'the site') was identified as a priority for inspection as:

- Environment Agency records indicate that the site, which comprises two areas of land located between Armitage Road and the Trent and Mersey Canal, formerly operated as a landfill site (records indicate a former landfill, but it is more credible that the site was infilled with waste material but was not formerly operated as a landfill site).
- The site is considered to be sensitive as residential properties with gardens and a community centre overly the inferred extent of landfill, and the site is underlain by a principal aquifer.

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 December 2010. This report presents the findings of the detailed 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.

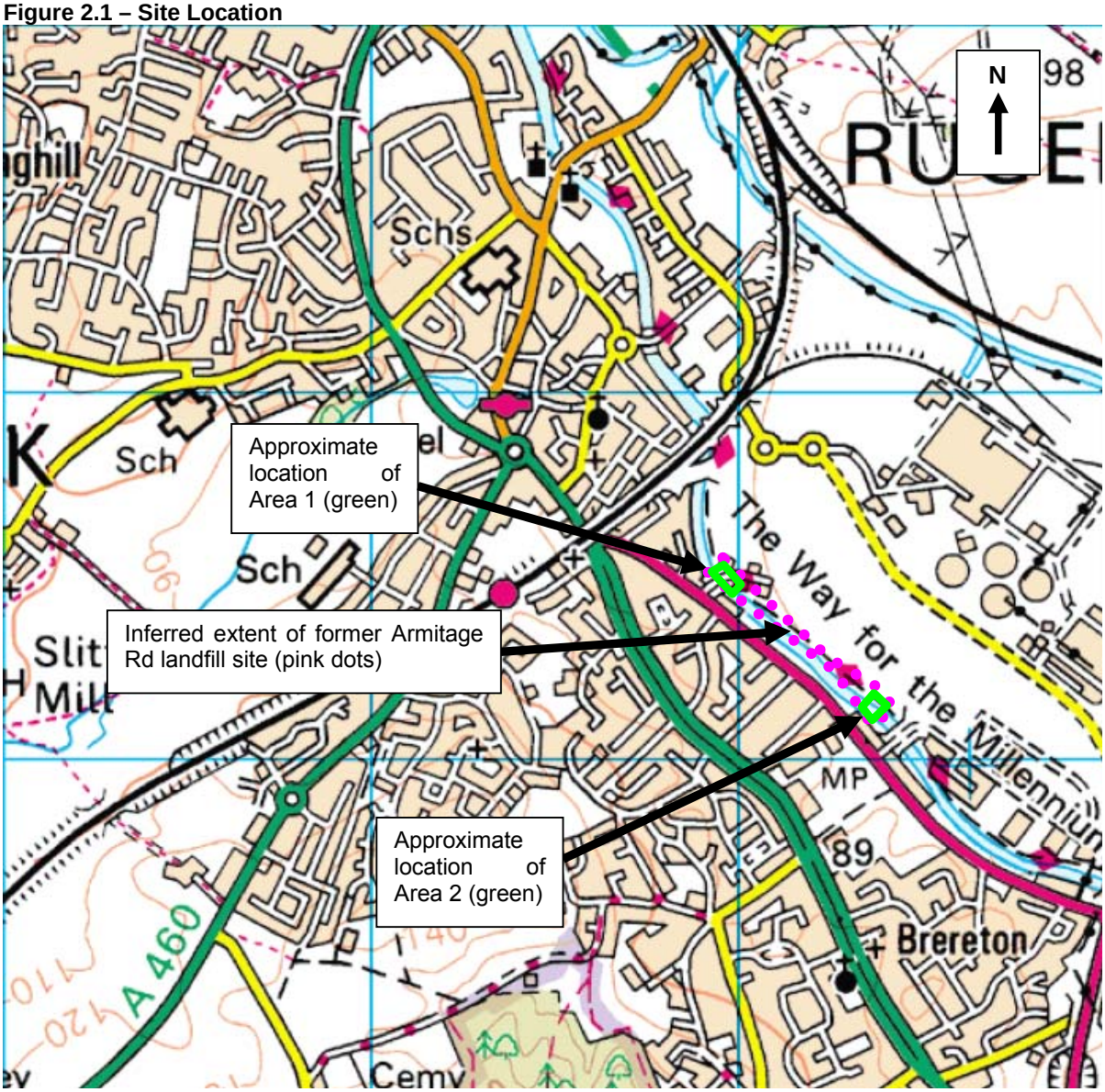
Table 2.1 – Site Setting

Data	Information
Address	The site comprises two areas of land located between Armitage Road and the Trent and Mersey Canal. Postcodes to the two areas are WS15 1DF (area 1) and WS15 1PH (area 2). The two areas of land form part of a narrow linear parcel of land which records indicate was formerly operated as a landfill site (see "history" below).
Current site use:	Residential houses with gardens and a community centre
Grid Reference:	Area 1 is located at approximate NGR 404960,317440. Area 2 is located at approximate NGR 405340,317080.
Site Area:	Area 1 is approximately 0.16 ha. Area 2 is approximately 0.4 ha.
Topography:	Generally flat.
Surrounding land use	**Area 1:** North: minor road adjacent, pub and housing @ 5m East: canal adjacent, open land (10-500m), power station beyond South: Armitage Rd and small electricity substation adjacent, residential housing beyond West: Armitage Rd adjacent, residential housing beyond **Area 2:** North: modern residential housing adjacent East: canal adjacent, open land being developed as a business park (10-500m), power station and existing industrial estate beyond South: Armitage Rd and Wheelhouse Rd adjacent, residential / running track / football pitch beyond (@ 15m) West: Armitage Rd adjacent, allotments @ 15m, industrial buildings 100m
Mapped Geology	British Geological Survey (BGS) mapping indicates that Areas 1 and 2 are underlain by bedrock of the Bromsgrove Sandstone Formation (pebbly sandstone). The sandstone belongs to the Sherwood Sandstone Group. Area 1 is located directly upon the sandstone bedrock, whereas in Area 2, the bedrock is overlain by mapped superficial River Terrace Deposits (sand and gravel).
Hydrogeology	The Environment Agency website indicates the Bromsgrove Sandstone is a principal aquifer. Principal aquifers are layers of rock or drift deposits that have high inter-granular and/or fracture permeability usually providing a high level of water storage. They may support water supply and/or river base flow on a strategic scale. The River Terrace Deposits are indicated to be a secondary A aquifer. Secondary A aquifers are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.
Source Protection Zones (SPZs)	The Environment Agency website indicates that the site does not lie within a SPZ.
Surface Waters	The Trent and Mersey Canal is located directly east of Areas 1 and 2. Additionally, a stream is located 500m south of area 2.
Historical Land Use	Environment Agency records supplied to the council indicate that the site was formerly operated as a landfill. The landfill is shown on Environment Agency "What's In Your Back Yard" website and is recorded as being operational from 1960 (no closure date is supplied on the records). The landfill is recorded to have received commercial waste from premises used wholly or mainly for trade, business, sport,

Data	Information
	recreation or entertainment, and excludes household and industrial waste. Off-site surrounding historical land uses cited in existing reports (references in Section 1.3) include: • a garage and forecourt, immediately north of Area 2 and within the extent of the former Armitage Road landfill site. Cannock Chase Council has informed Grontmij that an application to develop the site was submitted in 2007 and thus, contaminated land issues were considered as part of the planning process. The site is therefore likely to have been remediated to a suitable standard for residential end-use, and does not form part of the study site • former off-site power station and engineering works buildings to the east, immediately beyond the canal. This area has been redeveloped as an industrial estate / development-ready plots as part of an Advantage West Midlands initiative; any gross contamination is likely to have been remediated as part of the development, to render the site suitable for commercial end-use. Nonetheless, leachable contamination associated with the historic use of land to the east could theoretically be present beneath the study site {the adjacent canal is likely to be clay-lined and therefore is unlikely to provide a hydraulic cut-off between the developed site and the study site, as contamination could pass beneath the canal).
Ecologically designated sites[1]	Multi-Agency Geographical Information for the Countryside (MAGIC) search confirmed that no designated sites are present within a 500 m radius of the study site.
Archaeological sites	English Heritage Pastscape website indicates no important features beneath or within 100m of the site

[1] Includes sites designated as Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR), Special Area of Conservation (SAC, including candidate sites), Special Protection Area (SPA including potential sites), listed Wetlands of International Importance (Ramsar site) and Local Nature Reserves (LNR).

Figure 2.1 – Site Location



Reproduced from Ordnance Survey Map under licence AL549878 with permission from the Controller of HMSO, © Crown Copyright (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 on-line data resources, in-house mapping and records provided by the council, 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[2] and statutory guidance[3]. The CSM is re-presented as Table 2.2 overleaf.

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

Table 2.2 - Potential Pollutant Linkages

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)	Contaminants including (but not limited to) metals, hydrocarbons, (including PAHs), VOCs and SVOCs) and asbestos within landfill material.	Dermal contact and direct ingestion, inhalation of dust/vapours, consumption of home-grown vegetables	Medium	Likely	Moderate	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. Sample collection and analysis required to refine conclusion on risk
2	Residents of properties above infilled ground within area 1 only. Principal aquifer beneath area 1.	Hydrocarbons and PCBs associated with possible leakages from substation, adjacent to the south of area 1	Leaching to aquifer; migration of dissolved phase or NAPL beneath housing; subsequent dermal / oral. inhalation exposure	Medium	Low	Low / moderate	Substation is small and unlikely to have given rise to significant contamination. No ground discolouration noted during walkover. Therefore, no further assessment proposed
3	Residents of properties & users of community centre, above infilled ground	Methane and carbon dioxide from decomposition of any “waste” elements of landfill material	Movement into buildings, subsequent asphyxiation and explosion risk	Medium	Likely	Moderate	Installation and monitoring of wells for gases and flow rates is required to refine conclusion on risk

No.	Receptor	Contaminant(s)	Pathway(s)	Potential Severity of Linkage[1]	Probability Of Linkage Occuring[1]	Overall Risk[1]	Comments
4	Subsurface services serving the buildings (principally water supply)	Contaminants including (but not limited to) metals, hydrocarbons, (including PAHs), VOCs and SVOCs) within landfill material	Chemical attack and tainting of water supply could occur at high contaminant concentrations / severe pH levels	Mild	Likely	Low to moderate	Further investigation data needed to refine assessment/CSM
5	Property (Structures) – sub-surface concrete	Sulphate and pH	Contact between contaminants and concrete	Mild	Likely	Low to moderate	Further investigation data needed to refine assessment/CSM
6	Secondary A aquifer beneath area 2	Contaminants including (but not limited to) metals, hydrocarbons, (including PAHs), VOCs and SVOCs within landfill material	Leaching of contaminants within landfill to aquifer	Medium	Likely	Moderate	Groundwater sampling and analysis required to refine assessment/CSM. The secondary aquifer overlies a principal aquifer, so dense contaminants could reach the latter aquifer. If any dense contaminants encountered, discuss findings with Environment Agency and agree next step
7	Principal aquifer beneath area 2	VOCs which exist as DNAPL and “dense” dissolved phase contaminants which have leached to the secondary aquifer	Downwards migration of DNAPL or dense dissolved contaminants from the secondary aquifer to the primary aquifer	Medium	Low to Likely	Low / moderate	Analysis of leachate (in landfill) and dissolved phase (toward base of secondary aquifer) for dense contaminants (such as solvents) required to refine assessment/CSM. If any dense contaminants encountered, discuss findings with Environment Agency and agree next step – which could comprise drilling to the principal aquifer and obtaining groundwater samples

No.	Receptor	Contaminant(s)	Pathway(s)	Potential Severity of Linkage[1]	Probability Of Linkage Occuring[1]	Overall Risk[1]	Comments
8	Principal aquifer beneath area 1	Contaminants including (but not limited to) metals, hydrocarbons, (including PAHs), VOCs and SVOCs within landfill material	Leaching of contaminants within landfill directly to aquifer	Medium	Likely	Moderate	Analysis of leachate required to refine assessment/CSM. If any contaminants encountered, discuss findings with Environment Agency and agree next step – which could comprise drilling to the principal aquifer and obtaining groundwater samples
9	Canal, adjacent to the east, plus fish within canal (subject to fishing rights)	Contaminants including (but not limited to) metals, hydrocarbons, (including PAHs), VOCs and SVOCs within landfill material	Lateral migration of dissolved contaminants into canal (plus uptake by fish)	Medium	Unlikely	Low	Canal is likely to have clay walls in order to hold canal water in – so it is unlikely that any mobile dissolved phase contaminants could enter the canal. No further assessment proposed
10	Stream, 500m south of area 2	Contaminants including (but not limited to) metals, hydrocarbons, (including PAHs), VOCs and SVOCs within landfill material	Lateral migration of dissolved contaminants within shallow groundwater in River Terrace Deposits	Medium	Unlikely	Low	Theoretically possible, but distance of stream from site dictates that significant mixing and attenuation of contaminants is likely to occur on the flowpath to the stream. No further assessment proposed

[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 extract in Appendix B

3 INITIAL INTRUSIVE INVESTIGATION

In order to further examine the potential pollutant linkages identified in Table 2.2, and following a successful application for DEFRA funding, a site investigation was undertaken on the 9th December 2010. This section describes the site investigation undertaken and results obtained.

3.1 Scope and Methodology

The 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 three hand held window sample holes (WS1 – WS3) to a maximum depth of 2.0m bgl, at the locations shown on Drawing 1. The window sample holes, which were drilled by Sherwood Drilling Services, were positioned in the gardens of housing located above the extent of infill, as indicated on historical mapping and by anecdotal evidence. Locations 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;
- Advancing three hand dug pits (HP1-HP3) to a maximum depth of 0.7m, to examine shallow soil conditions and augment the site coverage provided by the window sampler holes;
- 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
- Submitting retained samples to Alcontrol Geochem in cooled coolboxes and under full chain of custody documentation, and instructing the analysis of samples, and;
- Undertaking four ground gas monitoring rounds, using a Gas Data Limited GFM435 gas analyser with internal flow pod.

3.2 Results

3.2.1 Ground Conditions

The ground conditions encountered at the site generally comprised Made Ground overlying slightly clayey, gravelly sand.

Made Ground
Made Ground was encountered in four of the six exploratory holes (HP1 to HP3 and WS1). The Made Ground was encountered to a maximum depth of 1.5m bgl (in WS1) and was predominantly granular in nature, consisting of a single sand horizon or sand, gravel and occasional clay layers and pockets. The gravel content of the Made Ground was variable, including brick, ash, clinker and quartz. No evidence of municipal waste was encountered.

Natural Deposits
Encountered within all three window sample locations and HP3, at depths ranging between 0.15m and 1.5m bgl, and proven to borehole refusal at a maximum of 2.0m bgl. The deposits typically comprised slightly silty, slightly clayey gravelly sand. The gravel content consisted of fine to coarse quartz and sandstone.

Groundwater
No groundwater was encountered during the excavation of any exploratory holes.

The above findings are discussed further in Section 4 (updated CSM). All exploratory hole logs, providing full details of the strata encountered, are included within Appendix C.

3.2.2 Adequacy of Investigation Depth and Spatial Extent

Natural deposits were proven in four of the six exploratory hole locations, including all three windowless sampler locations (i.e. all three holes advanced beyond 0.7m bgl). This suggests that the full depth of infill material at the site has been encountered, and gas monitoring (Section 3.2.5) is likely to be representative of the full body of infill.

While, as with most investigations, it would be desirable to increase coverage of the site, the areal and depth coverage obtained is considered to be sufficient for an initial exploratory investigation. As groundwater was not encountered, leachate testing was scheduled, in order to examine potential risk to the underlying aquifers (Section 3.2.5).

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 3.1:

Table 3.1 - Field Evidence of Potential Contamination

Exploratory Hole	Visual and Olfactory Evidence of Contamination
WS1	0-1.0m bgl; Occasional ash, clinker and brick fragments within matrix
HP1	0.1-0.7; Occasional ash clinker and brick within matrix
HP2	0-0.7m bgl; Occasional ash clinker and brick within matrix

3.2.4 Soil Analysis Results

Six samples were submitted for laboratory analysis, under full 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 the observations of potential contamination made in the field, and to achieve good spatial coverage of the site.

Table 3.1 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 are subsequently ingested by humans. The screening values used, in order of preference, comprise:

- 2009 Soil Guideline Values (SGVs) published by the Environment Agency / DEFRA, generated using the latest Contaminated Land Exposure Assessment (CLEA) model, version 1.06

- Generic Assessment Criteria (GAC) published by Land Quality Management Limited (LQM) or the Environmental Industries Commission (EIC), or calculated by Grontmij, all using CLEA 1.06
- SGVs published by the Environment Agency / DEFRA between 2002 and 2007, calculated using prior versions of the CLEA model.

Full analytical testing results are included as Appendix D.

Table 3.2 – Soil Analysis Results Summary

Determinand	No. of Samples Tested	Minimum Value	Maximum Value	SGV / GAC[1]	Locations where SGV or GAC are exceeded
Arsenic	6	11	16	32	-
Barium	6	120	220	1300	-
Beryllium	6	0.70	1.8	51	-
Boron (water-soluble)	6	<1.0	1.4	291	-
Cadmium	6	0.80	2.4	10	-
Chromium, hexavalent	6	<0.60	<1.2	4.3	-
Chromium, total	6	11	20	3,000	-
Copper	6	26	36	2,330	-
Lead	6	78	240	450[2]	**-**
Mercury	6	<0.10	0.20	0.42[3]	-
Nickel	6	13	27	130	-
Selenium	6	<1.0	<1.0	350	-
Vanadium	6	17	50	75	
Zinc	6	130	750	3,750	-
Asbestos screen	4	No ACMs detected			**-**
Phenol	3	<0.10	<0.10	290	
Benzene	3	<0.01	0.14	0.16	**-**
Toluene	3	<0.002	0.05	270	**-**
Ethyl Benzene	3	<0.003	0.02	150	**-**
Xylene	3	<0.003	<0.01	98[4]	**-**
TPH – CWG Hydrocarbons	2	None of the banded aliphatic/aromatic TPH-CWG screening criteria were exceeded. Full speciated results are presented in Appendix D			-
Polyaromatic Hydrocarbons (PAHs)	6	Speciated PAH screening criteria were not exceeded, with the exception of benzo(a)pyrene (see below). Full speciated results are presented in Appendix D			
Benzo(a)pyrene	6	0.30	3.5	0.94	**WS1, 0.3m; WS2, 0.3m; HP2, 0.1m**
Volatile Organic Compounds and Semi-Volatile Organic Compounds (excluding TPH and PAH above)	3	All laboratory results below limit of detection with exception of below:			-
Dichloromethane	3	0.060	0.063	0.98	-

Values presented in mg/kg, correct to two significant figures unless rounding influences screening outcome or minimum value. SGVs and GAC are presented without any rounding. **Bold values** indicate locations where observed concentrations exceed the screening value.

[1] Six samples were tested for Soil Organic Matter (%SOM) content. A minimum value of 1.88% and a maximum of 10.8% were recorded, with a mean of 4.8% and a median of 4.6%. It is therefore justified, as a conservative measure, to use the SGVs and GAC generated using a 2.5% SOM value in CLEA in an initial screen, where the SGVs/GAC are SOM-dependant (mercury, phenol, PAHs, TPH-CWG and dichloromethane). All other SGVs / GAC are not SOM-dependant

[2] SGV generated by DEFRA using earlier version of CLEA. A new published value using the latest version of CLEA is awaited

[3] Testing results presented represent total mercury. SGV presented is for elemental mercury, the most stringent of the elemental, inorganic and methyl mercury SGVs

[4] SGV for para-xylene quoted (most stringent of the three isomers)

The concentrations of benzo(a)pyrene within three samples exceed the generic screening values adopted.

3.2.5 Soil Leachate Analysis Results

Three soil samples were submitted for soil leachate analysis (BS12457 2:1 single stage test, which supersedes the older NRA leachate test) at Alcontrol. The samples comprised the most likely soils to contain elevated contaminant concentrations, based upon field observations, and included samples from WS1 and HP1, which contained concentrations of benzo(a)pyrene in excess of the soil Tier 1 screening value within the solid phase analysis. Table 3.2 presents a summary of the analysis results.

The results have been compared to the following threshold values:

- For surface watercourses, the most stringent of the values quoted in either:
  - Annual average "good" values for rivers and freshwater lakes quoted in Part 4, or for inland surface waters quoted in Parts 5 and 6, or minimum threshold values for "groundwater impacts on surface waters" in Part 8, of the River Basin Districts Typology, Standards and Groundwater Threshold Values (Water Framework Directive) (England and Wales) Directions 2010 ("WFD values") or;
  - UK Environmental Quality Standards (EQSs), protective of aquatic plants and animals in surface watercourses,
- For groundwater, the most stringent of the "groundwater drinking water protected areas" values in Part 8 of the above WFD, or UK Drinking Water Standards.

The above groundwater screening criteria are generally adopted as a Tier 1 screen for water within a Principal aquifer, such as the Bromsgrove Sandstone beneath the site. The application of drinking water quality guidelines to groundwater within a Secondary aquifer, such as the River Terrace Deposits beneath part of the site, is a particularly conservative measure.

Full analytical testing results are included in Appendix D.

Table 3.3 – Soil Leachate Analysis Results Summary

Contaminant	No of Samples Tested	Minimum Value	Maximum Value	Surface Water	Groundwater
Arsenic	3	4.6	5.7	52	7.5
Boron	3	40	110	2000	750
Cadmium	3	<0.10	<0.10	0.08 – 0.25	3.75
Chromium	3	3.4	4.6	4.7 (for Cr III)	50
Chromium (VI)	0	-	-	3.4	n/s
Copper	3	**2.9**	**11**	**1 - 28****	1500
Lead	3	0.81	4.8	7.2	10
Nickel	3	1.2	4.0	20	15
Vanadium	3	4.6	5.6	20 – 60**	n/s
Zinc	3	3.9	6.9	8 - 125**	3750
Mercury	3	<0.01	0.04	0.05	0.75
Benzene	3	<1.3	<1.3	10	0.75
Toluene	3	<1.4	<1.4	50	n/s
Xylene	3	<1.7	<1.7	30	n/s
Naphthalene	3	<3.5	<3.5	2.4	n/s
Benzo(a)pyrene	3	<1.0	<1.0	0.05	0.01
Sum of benzo(b)fluoranthene and benzo(k)fluoranthene		<2.0	<2.0	0.03	n/s
Sum of benzo(g,h,i)perylene and indeno(1,2,3-cd) pyrene		<2.0	<2.0	0.002	n/s
Volatile Organic Compounds and Semi-Volatile Organic Compounds (excluding above)	3	All results <detection limit with exception of below:		Various	
Isophorone	3	<1.0	1.1	n/s	n/s

Values are presented as ug/l and are rounded as applicable to the screening values used. **Bold values** indicate testing results in excess of screening values.
** value adopted is dependant upon hardness of the receiving watercourse
*** quoted as a 95th percentile standard, i.e. value can be exceeded up to 5%of the time without being considered a "fail"
n/s – no standard
Yellow highlight indicates UK Environmental Quality Standard
Green highlight indicates UK Drinking Water Standard

The recorded concentrations of copper in leachate exceeded the adopted Tier 1 screening value for surface waters in all three samples, (in all cases, the exceedances are of the low end of quoted screening value ranges).

The Tier 1 screening values for naphthalene, benzo(a)pyrene, "sum of benzo(b)fluoranthene and benzo(k)fluoranthene" and "sum of benzo(g,h,i)perylene and indeno(1,2,3-cd) pyrene" were also exceeded, but the recorded concentrations of the above compounds were below the laboratory method detection limit (indeed, all PAH compounds were below their respective detection limits). It is therefore unlikely that there is a significant source of PAHs beneath the site, and PAHs are unlikely to leach to controlled waters at unacceptable concentrations.

A groundwater screening value has not been published to date for the semi-volatile organic compound (SVOC), isophorone, which has been detected at a concentration marginally above

the laboratory detection limit. Given that the recorded concentration is only slightly in excess of the detection limit, it is unlikely that isophorone within the made ground poses a significant human health risk. Additionally, as no other SVOCs were detected in leachate or in the solid phase analysis at concentrations above the laboratory detection limit, it is unlikely that a significant source of SVOCs is present beneath the site.

3.2.6 Ground Gas Monitoring

Four rounds of ground gas monitoring were undertaken, using a Gas Data Limited GFM435 with internal flow pod. A summary of the maximum gas monitoring results recorded in each well is presented in Table 3.3, with full monitoring data in Appendix E.

Table 3.4 - Summary of Gas Monitoring Data

Well	Maximum Values Recorded During Monitoring Events:					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)*		
WS1	0.1	0.9	0	0	0.7	0.0063	1
WS2	0.1	1.4	0	0	0.1	0.0014	1
WS3	0.1	1.3	0	0	0.1	0.0013	1

Atmospheric Pressure:		
	28/01/2011	1022mb (Steady)
	11/02/2011	1007mb (Falling Trend)
	25/02/2011	1018mb (Steady)
	11/03/2011	1011mb (Falling trend)

Readings obtained within a 3 minute measurement period, obtained with a Gas Data Limited GFM435.
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 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 0.01 l/hr is assumed

The summary data presented above indicates that, in regard to methane and carbon dioxide, CIRIA characteristic situation 1 should be applied to all 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. The monitoring results therefore indicate that methane and carbon dioxide are unlikely to pose a risk to the existing housing at the site.

Carbon monoxide and hydrogen sulphide were not detected at concentrations in excess of the gas analyser detection limit, indicating that the inhalation risk posed by these gases is negligible.

3.2.7 Safety of Water Supply Pipes

Two publications have been 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 has recently confirmed that the UKWIR report can be deemed to supersede the WRAS 2002 report. However, the chemical analyses presented in this report were scheduled prior to the

re-issue of the UKWIR report, and hence are targeted at the list of chemicals within the WRAS report. A comparison to both WRAS and UKWIR screening values is therefore presented below.

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 Table 3.4. 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, cyanide and coal tar have not been tested for.

Table 3.5 - Initial WRAS Threshold Screen

Analyte	Test Results – Soils Within Top 1.2m of Soil Profile (mg/kg)		WRAS Threshold Value (mg/kg)
	Max	Mean (where max>threshold))	
pH	6.61 - **8.56**	7.53	<5 or **>8**
Arsenic	**16**	**13.5**	**10**
Cadmium	2.41	-	3
Chromium (hexavalent)	<1.2	-	25
Chromium (total)	20	-	600
Lead	240	-	500
Mercury	0.18	-	1
Selenium	<1	-	3
Phenol	<0.1	-	5
Polyaromatic Hydrocarbons	44	-	50
Toluene extractable	0.052	-	50
Petroleum Hydrocarbons (TPH CWG total aliphatic & aromatic >C5-C44)	**230**	**150**	**50**

Bold values indicate exceedance of WRAS threshold value

The maximum concentrations of arsenic and petroleum hydrocarbons, and the maximum soil pH level recorded, exceed the WRAS threshold values. The mean concentrations of arsenic and petroleum hydrocarbons also exceed the WRAS threshold values.

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 Armitage Road site was scheduled prior to the publication of the re-issued UKWIR report (despite a re-issue date 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 has identified that:

- The total VOC results recorded in all three samples tested (HP1,HP2 and WS1) exceed the UKWIR threshold for PVC pipework
- The BTEX results recorded in all three samples tested (HP1, HP2 and WS1) exceed the UKWIR threshold for PVC pipework. WS1 also exceeds threshold for PE pipework
- The Mineral Oil C11-C20 threshold for PE pipework is exceeded in HP3 and WS1

Summary

it is possible that the concentrations of contaminants at the site could adversely affect drinking water quality, depending on the materials used for water distribution (South Staffordshire Water pipes) and local connections to the network (probably installed by the house builder).

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

4 FURTHER ASSESSMENT OF RISK

4.1 Benzo(a)Pyrene in Soil

4.1.1 Introduction

The site investigation has established that the concentration of benzo(a)pyrene within three samples exceeds the generic screening value applicable to the generic residential housing scenario, where plants are grown for human consumption. The remaining three samples obtained at <0.7m bgl depth and analysed at the laboratory did not contain benzo(a)pyrene concentrations in excess of the SGV (i.e. six samples in total were tested for benzo(a)pyrene).

Generic SGVs and generic acceptance criteria (GAC) represent "safe" concentrations of contaminants, above which unacceptable impacts may occur and further assessment is generally required. Exceedance of SGVs or GAC does not necessarily mean that a significant possibility of significant harm ("SPOSH" - i.e. unacceptable risk to human health or the environment) is posed to human health. 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. Therefore, an exceedance of a SGV or GAC does not necessarily mean that SPOSH exists - only that a generic, conservative screening value has been exceeded, and further assessment is required.

4.1.2 Statistical Analysis Approach

Guidance regarding how data collection, data review and statistical testing interact to produce defensible conclusions regarding the condition of land is provided within Part 2A of the Environmental Protection Act 1990 and Guidance on Comparing Soil Contamination Data with a Critical Concentration[4] ("the guidance").

In order for statistical analysis to be applied, the dataset under inspection should strictly be the result of an unbiased sampling strategy. While there are a number of reasons why the sampling strategy could be viewed as biased, we conclude that the strategy was as close to being unbiased as possible, as discussed below:

- Parts of the site, such as areas beneath houses and roads, were not accessible, thus some soils were much less likely to be sampled than others. However, it would be unreasonable to attempt to sample such soils in an initial investigation, and samples taken from garden areas are likely to be representative of infill material beneath the site as a whole (while acknowledging that recent additional made ground may have been placed to form structures)
- Residents were, in some cases, reluctant for some parts of their gardens to be disturbed, meaning that some soils were unlikely to be tested – but again, it is likely that the area available for sampling is likely to be representative of garden areas across the site as a whole
- Within each exploratory hole, contaminated land practitioners typically sample and analyse a "representative worst case" sample of the soil encountered – so, while a very small pocket of ash within otherwise "clean" soil may not be analysed, samples would typically be taken of a 0.2m wide band of ash, rather than from the "clean" soil above or below such a band. Such sampling and testing is desirable, as it gives an indication of "representative worst case" conditions. Thus, while such sampling is arguably biased, the bias is towards over-estimating typical concentrations of contaminants in the soil across the site. Thus, if

[4] The Chartered Institute of Environmental Health, CL:AIRE and The Soil and Groundwater Technology Association; May 2008.

the average concentration of such "representative worst case" samples is below the SGV or GAC, it follows that soil conditions across the site as a whole are also likely to be below the relevant SGV or GAC.

Statistical analysis of the dataset has therefore been undertaken, as described below.

4.1.3 Averaging Areas

The first step of statistical analysis is to define the "averaging area" over which data would be examined. An averaging area is an area of soil which, when sampled, is considered to provide a representative indicator of how much contaminant a receptor is exposed to.

Based on the history of the site (i.e. all the site is thought to be underlain by infill) and current use of the site (i.e. residential housing, with minor areas of lower sensitivity), the entire site was defined as a single averaging area, and all recorded lead concentrations in the soil obtained at <0.7m bgl depth were examined as a single dataset.

It could be argued that each residential property should be defined as a single averaging area, based upon the exposure of each individual receptor. However, as the goal of the investigation is to examine whether there is a significant possibility of significant harm (SPOSH) to sensitive receptors at the site *as a whole* (as characterised by the samples obtained and tested), and given that it was excessively intrusive to residents to obtain and test multiple samples from each garden during an initial investigation, such an approach was rejected.

4.1.4 Outlier Test

The second stage of statistical analysis requires a test to identify whether any outliers, potentially indicative of laboratory error or a separate population of data (for which a separate averaging area should be defined), are present.

The Guidance indicates that an outlier should only be excluded from a population of data if

The outlier is obviously and demonstrably the result of an error that can be identified and explained - in which case the correct value should be identified and the dataset amended, where possible, or the erroneous value excluded with justification, or

The outlier clearly indicates that more than one soil population exists within the dataset and this can be justified by (or informs the further development of) the conceptual model - in which case the different population expressed by the outlier(s) should be explored in more detail either by reviewing and refining zoning decisions and treating outlier values as a separate population or even individually or, if necessary, by undertaking further site sampling to verify conditions in the vicinity of outlier values.

In all other cases, outlying data should be assumed to be genuine and reflective of the full range of soil concentrations to which receptors may be exposed.

The ESI Limited Statistical Calculator has been used to test for outliers. The Calculator applies Grubb's Test to the entire dataset, but first requires the user to manually check that the dataset (excluding maximum value) is normally distributed, otherwise the test is not applicable. The dataset excluding maximum value was therefore checked, and was identified to be normally distributed.

The Calculator subsequently confirmed that there are no outliers within the dataset.

4.1.5 Hypothesis Testing

The second stage of statistical analysis is to define a null and alternative hypothesis and examine whether the null hypothesis should be rejected.

In a Part 2a scenario, the null (H_0) and alternative (H_1) hypothesis to be tested is:

'Is there sufficient evidence that the true mean concentration of the contaminant (μ) is greater than the critical concentration (Cc)?'.

The Null Hypothesis (H_o) and the Alternative Hypothesis (H_1) are therefore:

- H_o $\mu \leq C_c$ i.e. the true mean concentration is equal to or less than the critical concentration
- H_1 $\mu > C_c$ i.e. the true mean concentration is greater than the critical concentration

The "critical concentration" is the adopted benzo(a)pyrene residential SGV at 2.5% SOM of 0.94mg/kg.

The Guidance provides a detailed explanation of the hypothesis testing procedure, which includes comparison of the lower confidence limit of the (estimated) mean value with the critical concentration, to provide additional assurance that the (true) mean is also below the critical concentration at a defined level of confidence (conventionally 95%; this value has been adopted in this case).

The guidance also states that in the Part 2A scenario, if the sample mean is less than the critical concentration (C_c), the lower confidence limit of the sample mean must also be below the critical concentration, and the Null Hypothesis cannot be rejected.

The ESI Calculator has been used to calculate the mean of the recorded benzo(a)pyrene concentrations across the averaging area (the site), which is **1.46mg/kg**. This value is above the critical concentration of 0.94mg/kg, so the lower confidence limit (LCL) of the sample mean is now considered. The LCL has been calculated to be 0.43mg/kg, i.e. less than the critical concentration.

On the basis of the above data, the hull hypothesis cannot be rejected at a 95% level of confidence, as the LCL is less than the critical concentration. In this scenario, the Guidance indicates that the hypothesis test should be repeated on a "balance of probabilities" approach, whereby the null hypothesis should be rejected if the level of confidence against the null hypothesis is greater than 51%. The ESI calculator has been used to assess the level of confidence against the null hypothesis, which is reported to be **82%.**

On this basis, the null hypothesis is rejected, i.e. the statistical analysis indicates that with an 82% level of confidence, the true mean concentration of benzo(a)pyrene beneath the averaging area (whole site) is likely to exceed the adopted GAC of 0.94mg/kg.

4.1.6 Discussion

While the above section indicates that the likely true average concentration of benzo(a)pyrene beneath the site may pose a risk to the health of residents at the site, it is important to consider the wider context of the assessment, as outlined below:

1. The above assessment indicates that the true average concentration of benzo(a)pyrene at the site is likely to be around 1.5mg/kg, relative to the adopted GAC of 0.94mg/kg.
2. A GAC is a general screening value, applicable to all UK soils. Concentrations of contaminants below the GAC are highly unlikely to pose a health risk. Concentrations slightly above a GAC do not necessarily mean that the health of residents could be adversely affected; only that a conservative generic value has been exceeded.
3. GAC are calculated on the basis of a number of conservative assumptions in regard to human exposure to contaminants. GAC also draw upon the findings of high-dose experiments on laboratory animals, to extrapolate the effects of low doses of contaminants on humans. Given this uncertainty, a degree of conservatism is built into the GAC.
4. It is generally accepted within the industry that GAC for some compounds, including benzo(a)pyrene, are particularly conservative. We are aware of studies, using a "Margin of Exposure" assessment route, where benzo(a)pyrene residential screening values of 3.6mg/kg and 14mg/kg have been proposed by researchers or accepted by regulators. The Margin of Exposure assessment method involves, briefly:
    a. Examination of the results of toxicological studies to determine a "point of departure" (PoD) concentration, above which adverse health effects are observed
    b. Comparison of the point of departure to the estimated human exposure to the contaminant (i.e. probably the mean concentration observed at the site), to calculate Margin of Exposure (MoE), i.e. MoE = PoD / estimated exposure
    c. MoE > 100,000 is considered to be acceptable, i.e. if excess lifetime risk of cancer is less than 1 in 100,000, risk is tolerable.
5. The sampling strategy adopted, i.e. obtaining "representative worst case" samples, is likely to result in an over-estimate of the true mean concentration of benzo(a)pyrene at the site

On the basis of the above points, it seems unlikely that a mean benzo(a)pyrene concentration of 1.46mg/kg poses a significant possibility of significant harm (SPOSH) to the health of residents at the site.

4.1.7 Conclusion

The objective of this Part IIa assessment is to determine whether a significant possibility of significant harm (SPOSH) to sensitive receptors could be caused by contaminants beneath the site. The above report section argues that it is unlikely that a SPOSH to human health could be caused by the likely average concentration of benzo(a)pyrene beneath the site. Therefore, the site should not be designated as Contaminated Land on this basis.

4.2 Contaminant Permeation into Water Pipes

4.2.1 Introduction

The exploratory investigation has identified that the concentrations of contaminants in the soil could possibility pose a risk to the quality of drinking water, due to a permeation or tainting risk. To investigate the contaminant permeation / tainting risk further, samples of drinking water were collected from taps from a representative sample of properties, for submission to the laboratory.

4.2.2 Methodology

Three samples of mains tap water were obtained from the site on 31st May 2011. The samples were taken from properties where higher concentrations of soil-borne contaminants were encountered, i.e. at locations where the greatest risk to drinking water quality may be posed, with other samples taken from positions allowing good coverage of the site, as follows:

- 99, 121 and 125 Armitage Road

Samples were obtained after allowing the tap to run for one minute. The samples were submitted to Alcontrol Laboratories for chemical analysis for metals and PAHs (considered common contaminants that could have entered water supply pipes, on the basis of field observations and laboratory testing of soil samples).

4.2.3 Results and Conclusion

The results of the analyses are summarised in Table 4.2 below, along with a comparison to UK Drinking Water Standards (UKDWS) taken form the Water Supply Water Quality Regulations 1989 / 2000. Full testing results are included in Appendix F:

Table 4.1 - Tap Water Analysis Results

Contaminant	No of Samples Tested	Minimum Value µg/l	Maximum Value µg/l	UKDWS µg/l
Antimony	3	0.33	0.88	5.0
Arsenic	3	3.7	5.2	10
Boron	3	58	67	1000
Cadmium	3	<0.10	<0.10	5.0
Chromium	3	12	14	50
Copper	3	5.5	290	2000
Lead	3	0.11	1.1	10
Nickel	3	1.0	2.2	20
Zinc	3	7.7	74	5000
Mercury		<0.01	<0.01	1.0
Individual PAHs	3	All less than lab detection limits		Various

The maximum recorded contaminant concentrations within tap water either did not exceed the corresponding UK Drinking Water Standards (metals) or were below the laboratory method detection limit (PAHs).

The implications of the above findings are discussed further in the following report sections.

5 UPDATED CONCEPTUAL SITE MODEL

5.1 Introduction

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)	Individual benzo(a)pyrene concentrations in soil exceed GAC in three locations in the upper 0.3m However, statistical assessment of dataset and further consideration of risk (Section 4) indicate that the true average b(a)p concentration at the site is unlikely to pose significant risk to human health.	Dermal contact and direct ingestion, inhalation of dust/vapours, consumption of home-grown vegetables	Minor	Low	Very Low	No further assessment proposed
2	Residents of properties & users of community centre, above infilled ground	Low concentrations of gases and low flow rates recorded	Movement into buildings, subsequent asphyxiation and explosion risk	Medium	Unlikely	Low	No further assessment needed
3	Subsurface services serving the buildings (principally water supply)	Contaminants including arsenic, petroleum hydrocarbons, VOCs and pH values within infill material exceed UKWIR values. However, testing of tap water quality did not identify unacceptable dissolved contaminant concentrations	Chemical attack and tainting of water supply could occur at high contaminant concentrations / severe pH levels	Minor	Unlikely	Very Low	Results indicate that water quality is acceptable at this given point in time. No further assessment proposed (noting that as per any site, ongoing monitoring would be the only way to give confidence that water quality continues to be acceptable)

No.	Receptor	Contaminant(s)	Pathway(s)	Potential Severity of Linkage[1]	Probability Of Linkage Occuring[1]	Overall Risk[1]	Comments
4	Property (Structures) – sub-surface concrete	Sulphate and pH	Contact between contaminants and concrete	Mild	Low	Low	pH values generally between neutral, weakly alkaline pH values in one location. No sulphate testing undertaken, as class of concrete used to construct housing is unknown. Risk is considered to be a lower priority - no further assessment proposed
5	Property (Structures) – residential buildings on site	Decomposable or compressible elements of infill	Differential settlement of infill, causing structural failure of buildings	Medium	Unlikely	Low	Although a detailed inspection of buildings has not been undertaken, no obvious evidence of structural failure was noted and all properties at the site appear to be currently occupied. As buildings appear to be fit for occupancy, it is unlikely that significant harm to the building has been caused or is being caused (ref: DEFRA Circular 01/2006 p86 – this is statutory guidance accompanying the Environmental Protection Act 190.
6	Secondary A aquifer beneath area 2, Principal aquifer beneath entire site	Leachable contaminant concentrations were all below adopted Tier 1 screening values / laboratory detection limit, with exception of a low concentration of isophorone. Very limited extent of made ground beneath site	Leaching of contaminants within landfill to aquifer	Medium	Unlikely	Low	Isophorone concentration only slightly in excess of detection limit; no Tier 1 screening value published to date. No other SVOCs detected. Unlikely that significant source of SVOCs present in Made Ground. No further assessment proposed

No.	Receptor	Contaminant(s)	Pathway(s)	Potential Severity of Linkage[1]	Probability Of Linkage Occuring[1]	Overall Risk[1]	Comments
7	Stream 500m south of area 2	Leachable concentration of copper exceeds Tier 1 screening value. Leachable concentration of isophorone was slightly greater than lab detection limit. No Tier 1 controlled waters screening value published to date	Leaching to presumed shallow groundwater in River Terrace Deposits; lateral migration to stream	Medium	Unlikely	Low	Leachate testing indicates that copper exceeds the low end of a hardness-dependant range of screening values. Isophorone concentration is only slightly in excess of detection limit, and no other SVOCs were detected. Therefore, unlikely that significant source of SVOCs present in Made Ground. Given the distance of the receptor from the site, it is unlikely that unacceptable concentrations of copper or isophorone will migrate to the stream (dilution and attenuation processes are likely to reduce concentrations to acceptable values) No further assessment proposed

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

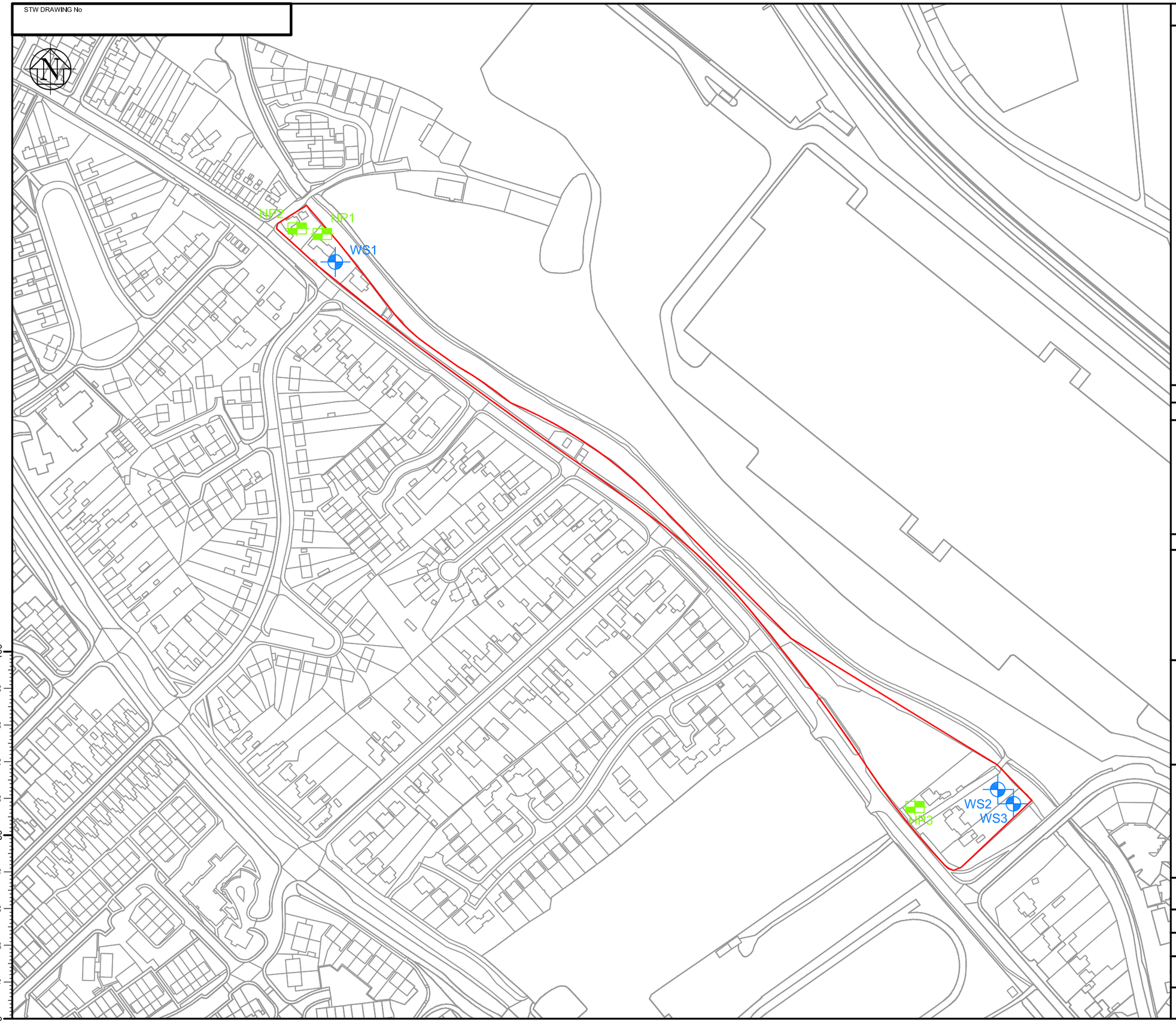
6 SUMMARY AND CONCLUSION

- Review of historical mapping and EA records provided to Cannock District Council, plus anecdotal evidence obtained during public consultation, identified that land off Armitage road, Rugeley, Staffordshire was infilled with unknown waste material which potentially posed a risk to human health and controlled waters.
- An exploratory ground investigation identified up to 1.5m of Made Ground (sand, gravel and clay with some brick and ash) overlying natural deposits of silty clayey sand.
- The concentration of benzo(a)pyrene in Made Ground in three of six samples tested exceeded generic human health screening criteria. However, it is unlikely that the true average concentration of benzo(a)pyrene beneath the site poses a significant risk to human health.
- Moderate concentrations of copper and isophorone in leachate are unlikely to pose a significant risk to groundwater or surface waters.
- Although concentrations of contaminants in soil exceed the generic screening criteria for contaminant permeation adopted by water companies, tap water quality testing has not identified a problem.
- Gas monitoring has identified that the concentrations and flow rates of hazardous gases beneath the site are unlikely to pose a human health or explosion risk to the housing at the site. No further assessment in regard to gas is necessary.

On the basis of the preceding assessment and the limitations listed in Appendix B, we consider that the site is unlikely to meet the definition of Contaminated Land as set out in Part 2A of the Environmental Protection Act 1990.

DRAWINGS

STW DRAWING No



NOTES

KEY:

- INFERRED EXTENT OF INFILLING
- WS1 — WINDOW SAMPLER
- HP1 — HAND PIT

REV	AMENDMENTS	ORIG	CHK'D	APR'D	DATE
-					

Grontmij

3rd Floor, Radcliffe House
Blenheim Court
Lode Lane
Solihull
B91 2AA

Tel : +44 (0)121 711 6600
Fax: +44 (0)121 711 6749
www.grontmij.co.uk

Bristol . Cumbria . Dublin . Edinburgh . Glasgow . Leeds . London . Peterborough . Reading . Solihull . Wrexham

CLIENT

Cannock Chase Council

PROJECT

ARMITAGE ROAD

TITLE

EXPLORATORY HOLE LOCATION PLAN

STATUS

FOR INFORMATION

ORIGINATOR	CHECKED	APPROVED
MIC	MJH	GVT
DATE 31/03/11	DATE 31/03/11	DATE 31/03/11

SCALE	ORIGINAL DRAWING SIZE
1:2500 @ A3	297 x 420 - A3

DRAWING No	REV.
106270-001	-

F:\U3064\proj\106270 Cannock 2a batch 2\drawings\106270-001.dwg

APPENDIX A

Cannock Chase District Council

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

Armitage Road Landfill Site, Rugeley, Staffordshire

August 2010

Prepared for:
Cannock Chase Council
PO Box 28
Beecroft Road
Cannock
Staffordshire
WS11 1BG

Prepared by:
Grontmij Limited
3rd Floor, Radcliffe House
Blenheim Court
Lode Lane
Solihull
B91 2AA

T 0121 7116600
F 0121 7116749
E gareth.taylor@grontmij.co.uk

Document Control

Report Reference	Issue Date	Reason for Issue	Prepared by		Checked by	Approved by
R467/103912/V1/2010	03/08/10	First Issue	Signature			
			Name	Richard Swayne	Gareth Taylor	Gareth Taylor
			Position	Senior Consultant	Principal Consultant	Principal Consultant

CONTENTS

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,
- Undertaking desktop reviews and walkovers, culminating in the production of reports for each priority site to improve the understanding of the sites and inform the planning of intrusive site investigations.

The prioritisation exercise identified an initial 12 sites requiring detailed desktop study and walkovers, including a former landfill site located on Armitage Road, Rugeley, which is discussed within this report.

The site comprises two areas of buildings located above a former landfill site and positioned between Armitage Road and the Trent and Mersey Canal, Rugeley. Area 1, opposite the junction of Armitage Road and Springfield Avenue (NGR 404959E, 317441N) consists of two residential properties with gardens and a community centre. Area 2, at the junction of Wheelhouse Road and Armitage Road (NGR 405341E, 317083N), comprises three residential properties with gardens. Areas 1 and 2 are considered to be sensitive as the residential properties and community centre overlie a former landfill which contains commercial waste. The site is also underlain by a sensitive principal aquifer.

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

1.2 Site Setting

The setting of the site is summarised in Table 1.1. The location of the site is shown on Figure 1.1. Drawing 1 shows the site location in the context of the inferred extent of the former landfill and former/current surrounding land-uses.

Table 1.1 – Site Setting

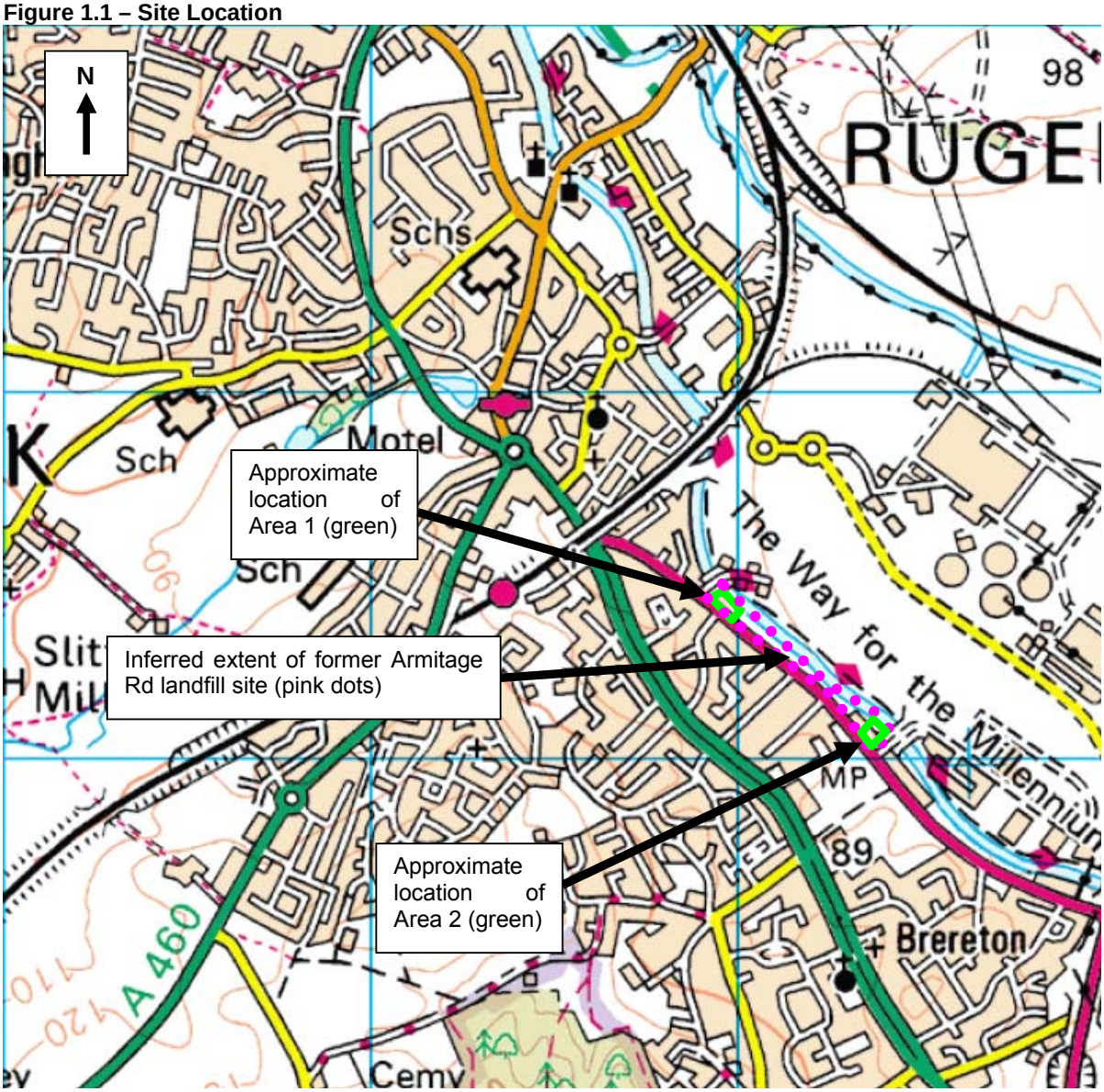
Data	Information
Address	The former Armitage Road Landfill Site in Rugeley, Staffordshire, comprises two areas located between Armitage Road and the Trent and Mersey Canal,. The nearest postcodes to the two area are WS15 1DF (area 1) and WS15 1PH (area 2).
Current site use	Residential houses with gardens (c 1900s to 1960s) and a community centre (c 1970s).
Grid Reference	Area 1 is located at approximate NGR 404960,317440. Area 2 is located at approximate NGR 405340,317080.

Data	Information
Site Area	Area 1 is approximately 0.16 ha. Area 2 is approximately 0.4 ha.
Topography	Generally flat.
Surrounding land use	**Area 1:** North: minor road adjacent, pub and housing @ 5m East: canal adjacent, open land (10-500m), power station beyond South: Armitage Rd and small electricity substation adjacent, residential housing beyond West: Armitage Rd adjacent, residential housing beyond **Area 2:** North: modern residential housing adjacent East: canal adjacent, open land being developed as a business park (10-500m), power station and existing industrial estate beyond South: Armitage Rd and Wheelhouse Rd adjacent, residential / running track / football pitch beyond (@ 15m) West: Armitage Rd adjacent, allotments @ 15m, industrial buildings 100m
Geology	British Geological Survey (BGS) mapping indicates that Areas 1 and 2 are underlain by bedrock of the Bromsgrove Sandstone Formation (pebbly sandstone). The sandstone belongs to the Sherwood Sandstone Group. Area 1 is located directly upon the sandstone bedrock, whereas in Area 2, the bedrock is overlain by mapped superficial deposits of River Terrace Deposits (sand and gravel).
Hydrogeology	The Environment Agency website indicates the Bromsgrove Sandstone is a principal aquifer. Principal aquifers are layers of rock or drift deposits that have high inter-granular and/or fracture permeability usually providing a high level of water storage. They may support water supply and/or river base flow on a strategic scale. The River Terrace Deposits are indicated to be a secondary A aquifer. Secondary A aquifers are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.
Source Protection Zones (SPZs)	The Environment Agency website indicates that the site does not lie within a SPZ.
Surface Waters	The Trent and Mersey Canal is located directly east of Areas 1 and 2. Additionally, a stream is located 500m south of area 2.
Historical Land Use	Environment Agency records supplied to the council indicate that the site was formerly operated as a landfill and was subsequently developed as residential housing. The landfill is shown on Environment Agency "What's In Your Back Yard" website and is recorded as being operational from 1960 (no closure date is supplied on the records). The landfill is registered to have received commercial waste from premises used wholly or mainly for trade, business, sport, recreation or entertainment, and excludes household and industrial waste. Off-site surrounding historical land uses cited in existing reports (references in Section 1.3) include:

Data	Information
	• a garage and forecourt, immediately north of Area 2 and within the extent of the former Armitage Road landfill site. The site was developed in c. 2007 and thus, contaminated land issues were considered as part of the planning process. The site is therefore likely to have been remediated to a suitable standard for residential end-use, and does not form part of the study site • former off-site power station and engineering works buildings to the east, immediately beyond the canal. This area has been redeveloped as an industrial estate / development-ready plots as part of an Advantage West Midlands initiative; any gross contamination is likely to have been remediated as part of the development, to render the site suitable for commercial end-use. Nonetheless, leachable contamination associated with the historic use of land to the east could theoretically be present beneath the study site {the adjacent canal is likely to be clay-lined and therefore is unlikely to provide a hydraulic cut-off).
Ecologically designated sites[1]	MAGIC search confirmed that no applicable sites are present within a 500 m radius of the study site.

[1] Includes sites designated as Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR), Special Area of Conservation (SAC, including candidate sites), Special Protection Area (SPA including potential sites), listed Wetlands of International Importance (Ramsar site) and Local Nature Reserves (LNR).

Figure 1.1 – Site Location



Reproduced from Ordnance Survey Map under licence AL549878 with permission from the Controller of HMSO, © Crown Copyright
Plan is not to scale.

1.3 Summary of available site information

Borehole Record BH-01, 2006
Through work for another client, Grontmij is aware of a borehole, drilled within the inferred extent of the former Armitage Road landfill, to the south east of Area 1 and north west of Area 2. This borehole recorded made ground to a depth of 1.65 mbgl. The made ground consisted of brown clayey sandy gravel containing ash, slag, and black sandy gravel. *(further details and a copy of the report have been omitted due to client confidentiality)*

Joynes Pike Associates, Armitage Road, Rugeley, Staffordshire; Geo-environmental Investigation Report, December 2006
This geo-environmental investigation was undertaken at a former garage (including petrol station) located immediately north of area 2, and within the inferred extent of the former

Armitage Road landfill site. The desk study element of the report identified the following potential sources of ground contamination:

- Ash and clinker within topsoil and imported made ground {potentially comprising the Armitage Road landfilled material), which could include imported colliery waste derived from the nearby Lea Hall Colliery and canal dredgings from the adjacent canal. Potential contaminants are wide-ranging but could include heavy metals, VOCs, SVOCs, PAHs and asbestos
- Potential hydrocarbons, asbestos, and solvents associated with the historical onsite activities as a fuel serving station and vehicle repair workshop.

The exploratory borehole logs advanced at the garage site encountered up to 1.1 m of made ground, which was noted to contain ash, asphalt, coal and carboniferous plant matter.

Chemical analysis undertaken as part of the site investigation recorded the following contaminant concentrations, in excess of current Soil Guideline Values (SGV) or Generic Assessment Criteria (GAC) protective of human health in a “residential with plant uptake” scenario:

- Benzo(a)pyrene concentrations of up to 3.6mg/kg (vs GAC @ 6% SOM of 1mg/kg)
- Dibenzo(a,h)anthracene concentrations of up to 1.7mg/kg (vs GAC @ 6% SOM of 0.9mg/kg)

As Areas 1 and 2 are located above the same mass of landfill as the locations where the above two investigations were undertaken, contaminants may be present beneath areas 1 and 2, potentially at concentrations that could pose a risk to human health.

(the Joynes Pike report is a large file size and has not been appended; a copy will follow on CD)

1.4 Walkover

The site has been subject of a walkover, carried out from the public highway. . No obvious evidence of contamination was identified during the inspection (including no obvious ground staining at the electricity substation, immediately south of area 1), but such evidence is unlikely to be uncovered by a visual inspection of land now occupied by residential properties.

2 PRELIMINARY CONCEPTUAL MODEL

2.1 Introduction

This section of the report presents a preliminary contaminated land assessment, on the basis of the available desktop data and information gathered during the walkover. 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[2,3] 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.

2.1.1 Sources of Contaminants

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

- Infilled land which could contain contaminants including (but not limited to) metals, hydrocarbons, PAHs, volatile and semi-volatile organic compounds (VOCs and SVOCs);
- Polychlorinated biphenyl (PCB) associated with the electricity substation; and,
- Methane and carbon dioxide gas, from the decomposition of any biodegradable material within the made ground.

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

2.1.2 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 2.1 lists all of the receptors to be considered by a Part IIA or PPS23[4] assessment, and assesses whether the receptors are likely to be present at the site.

Table 2.1 - Potential Receptors

Receptor Type	Receptors	Present (✓ /✗)	Notes
Humans	On-site residents	✓	Residential properties (houses and gardens) and community centre above indicative extent of landfill. Residential gardens assumed to be used for growing food crops.
	Users of community centre	✓	Receptor is present, but exposure duration and frequency will be less than residential receptor. As assessment of residential scenario will also be protective of community centre users, further assessment of community centre is not proposed
	Construction staff and site investigation personnel.	X	Not known if 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 of leachable contaminants migrating off-site through permeable strata. Level of risk is inferred to be lower than that posed to on-site residents, and is not assessed further
Ecosystems	Any designated ecological system[5], or living organism forming part of such a system	X	Inspection of MAGIC website has identified that Areas 1 and 2 are not located within 500m of an applicable ecological site.
Property (Flora and Fauna)	Crops, including timber	X	Not present.
	Produce grown domestically, or on allotments for consumption	✓	Gardens assumed to be used for growing food crops. Risk posed is considered to be covered by human health (residential with gardens) pathway and is not considered further.
	Livestock	X	Not present.

[4] Planning Policy Statement (PPS) 23: Planning and Pollution Control, Annex 2: Development on Land Affected by Contamination
[5] Includes sites designated as Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR), Special Area of Conservation (SAC, including candidate sites), Special Protection Area (SPA including potential sites), listed Wetlands of International Importance (Ramsar site) and Local Nature Reserves (LNR).

Receptor Type	Receptors	Present (✓ /✖)	Notes
	Other owned or domesticated animals	✓	Pets in residential properties. Risk posed is considered to be similar to that posed to on-site residents, and is not examined further
	Wild animals which are the subject of shooting or fishing rights	✓	Fish within canal, adjacent to the east of Area 1 and 2
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 (and in particular, water service pipes and foundations) above indicative extent of landfill.
Controlled Waters[6]	Territorial waters	✖	None feasibly close enough to be affected.
	Coastal waters	✖	None feasibly close enough to be affected.
	Inland Freshwaters	✓	Trent and Mersey Canal adjacent to the east. Stream 500m south of Area 2.
	Groundwater	✓	Area 2 underlain by secondary A aquifer (River Terrace Deposits). Areas 1 and 2 also underlain by principal aquifer.

2.1.3 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 2.2.

2.1.4 Potential Pollutant Linkages

The pollutant linkages identified are presented in Table 2.2.

[6] As defined in the Water Resources Act 1991 (Part III, Section 104). Generally includes most surface water bodies excluding drains which discharge into sewers.

Table 2.2 - Potential Pollutant Linkages

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)	Contaminants including (but not limited to) metals, hydrocarbons, (including PAHs), VOCs and SVOCs) and asbestos within landfill material.	Dermal contact and direct ingestion, inhalation of dust/vapours, consumption of home-grown vegetables	Medium	Likely	Moderate	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. Sample collection and analysis required to refine conclusion on risk
2	Residents of properties above infilled ground within area 1 only. Principal aquifer beneath area 1.	Hydrocarbons and PCBs associated with possible leakages from substation, adjacent to the south of area 1	Leaching to aquifer; migration of dissolved phase or NAPL beneath housing; subsequent dermal / oral. inhalation exposure	Medium	Low	Low / moderate	Substation is small and unlikely to have given rise to significant contamination. Whilst a theoretical risk, it is considered that efforts are best directed towards assessing the risk posed by the former landfill site. Such small substations are numerous, and it would not be good use of funding to investigate them all. Therefore, no further assessment proposed
3	Residents of properties & users of community centre, above infilled ground	Methane and carbon dioxide from decomposition of biodegradable elements of landfill material	Movement into buildings, subsequent asphyxiation and explosion risk	Medium	Likely	Moderate	Installation and monitoring of wells for gases and flow rates is required to refine conclusion on risk

No.	Receptor	Contaminant(s)	Pathway(s)	Potential Severity of Linkage[1]	Probability Of Linkage Occuring[1]	Overall Risk[1]	Comments
4	Subsurface services serving the buildings (principally water supply)	Contaminants including (but not limited to) metals, hydrocarbons, (including PAHs), VOCs and SVOCs) within landfill material	Chemical attack and tainting of water supply could occur at high contaminant concentrations / severe pH levels	Mild	Likely	Low to moderate	Further investigation data needed to refine assessment/CSM
5	Property (Structures) – sub-surface concrete	Sulphate and pH	Contact between contaminants and concrete	Mild	Likely	Low to moderate	Further investigation data needed to refine assessment/CSM
6	Secondary A aquifer beneath area 2	Contaminants including (but not limited to) metals, hydrocarbons, (including PAHs), VOCs and SVOCs within landfill material	Leaching of contaminants within landfill to aquifer	Medium	Likely	Moderate	Groundwater sampling and analysis required to refine assessment/CSM. The secondary aquifer overlies a principal aquifer; as an aquiclude may not be present, the sensitivity of the secondary aquifer is increased. If any dense contaminants encountered, discuss findings with Environment Agency and agree next step
7	Principal aquifer beneath area 2	VOCs which exist as DNAPL and “dense” dissolved phase contaminants which have leached to the secondary aquifer	Downwards migration of DNAPL or dense dissolved contaminants from the secondary aquifer to the primary aquifer	Medium	Low to Likely	Low / moderate	Analysis of leachate (in landfill) and dissolved phase (toward base of secondary aquifer) for dense contaminants (such as solvents) required to refine assessment/CSM. If any dense contaminants encountered, discuss findings with Environment Agency and agree next step – which could comprise drilling to the principal aquifer and obtaining groundwater samples

No.	Receptor	Contaminant(s)	Pathway(s)	Potential Severity of Linkage[1]	Probability Of Linkage Occuring[1]	Overall Risk[1]	Comments
8	Principal aquifer beneath area 1	Contaminants including (but not limited to) metals, hydrocarbons, (including PAHs), VOCs and SVOCs within landfill material	Leaching of contaminants within landfill directly to aquifer	Medium	Likely	Moderate	Analysis of leachate required to refine assessment/CSM. If any contaminants encountered, discuss findings with Environment Agency and agree next step – which could comprise drilling to the principal aquifer and obtaining groundwater samples
9	Canal, adjacent to the east, plus fish within canal (subject to fishing rights)	Contaminants including (but not limited to) metals, hydrocarbons, (including PAHs), VOCs and SVOCs within landfill material	Lateral migration of dissolved contaminants into canal (plus uptake by fish)	Medium	Unlikely	Low	Canal is likely to have clay walls in order to hold canal water in – so it is unlikely that any mobile dissolved phase contaminants could enter the canal. No further assessment proposed
10	Stream, 500m south of area 2	Contaminants including (but not limited to) metals, hydrocarbons, (including PAHs), VOCs and SVOCs within landfill material	Lateral migration of dissolved contaminants within shallow groundwater in River Terrace Deposits	Medium	Unlikely	Low	Theoretically possible, but distance of stream from site dictates that significant mixing and attenuation of contaminants is likely to occur on the flowpath to the stream. No further assessment proposed

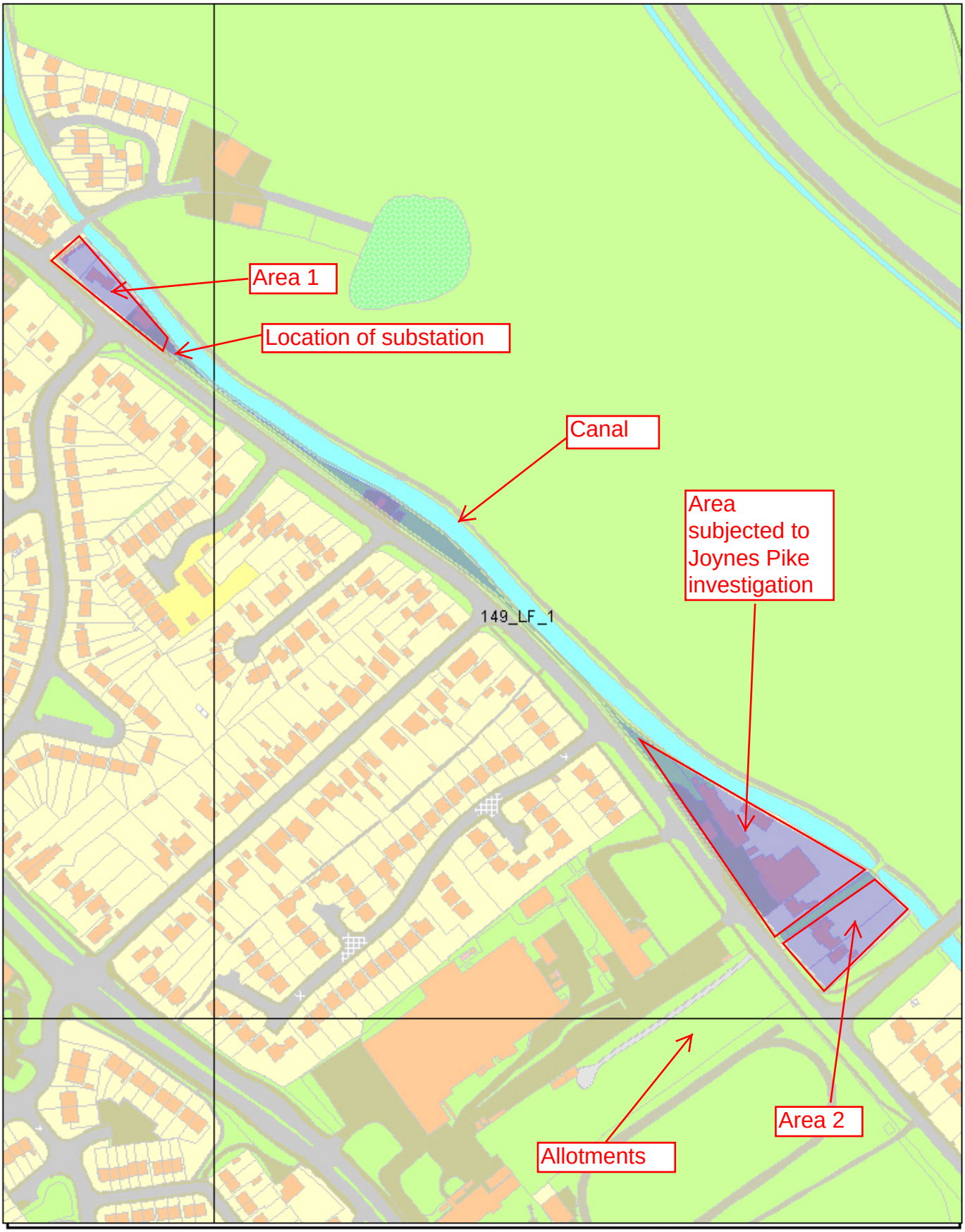
[1] Taken from Table 6.3, CIRIA report 552 (Contaminated Land Risk Assessment – A Guide to Good Practice. Severity classified as minor, mild, medium or severe. Probability classified as unlikely, low, likely or high. Overall risk considers both the severity and probability of the linkage (very low, low,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

3 CLOSING REMARKS

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

149_LF_1
Armitage Road,
South East of Rugeley,
Staffordshire

NOT TO SCALE | DATE



Appendix A (of desk study): 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, the Environment Agency 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.

6. The scope of this study, as agreed with Cannock Chase Council, comprised a review of available information, and data was not purchased from a proprietary database.

Appendix B (of desk study): 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:

Situation	Severity Category	Description	Examples
ACUTE PROBLEM	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
SIGNIFICANT HARM TO SENSITIVE RECEPTOR	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
SIGNIFICANT HARM TO LESS SENSITIVE RECEPTOR	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)
NON-SIGNIFICANT HARM	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 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 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

WINDOW SAMPLE LOG

WINDOW SAMPLE No **WS01**

Project	Client	Logged By
Cannock 2a Armitage Road	Cannock Chase DC	PSW

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
106270	09-12-10 12-12-10			

SAMPLES & TESTS			Water	STRATA				
Depth	Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Instrument / Backfill
0.10-0.10	ES					0.10	Grass over dark brown slightly silty slightly clayey gravelly SAND (Topsoil) Gravel is fine to coarse subrounded of quartz and sandstone. Occasional rootlets	
0.30-0.30	ES					(0.90)	MADE GROUND; Brown slightly silty, slightly clayey gravelly SAND. Gravel is fine to coarse sub angular to subrounded of various lithologies with occasional fragments of brick and ash.	
0.70-0.70	ES					1.00		
						(0.50)	MADE GROUND; Gravel of Brick (Brick rubble)	
						1.50		
1.80-1.80	ES					(0.50)	Grey, mottled red/brown, slightly silty slightly gravelly SAND. Gravel is fine to coarse, subrounded to rounded of quartz and sandstone	
						2.00	End of Hole at 2m bgl.	

Groundwater	General Remarks	Final Depth
Strike Depth: (m) Rising to: (m) Groundwater Remarks None Encountered	Refusal at 2.0m on cobble . Hole collapsed back in to 1.5m. Installed with Gas pipe	**2m bgl**

Contractor	Method/ Plant Used	
Sherwood Driling	Window Sampler	All dimensions in metres Scale 1:50

Sheet 1 of 1

GRONTMIJ WINDOW SAMPLE LOG 2006 ARMITAGE ROAD GINT.GPJ AGS3_ALL.GDT 4/5/11

WINDOW SAMPLE LOG

WINDOW SAMPLE No **WS02**

Project	Client	Logged By
Cannock 2a Armitage Road	Cannock Chase DC	PSW

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
106270	09-12-10 13-12-10			

SAMPLES & TESTS			Water	STRATA				
Depth	Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Instrument / Backfill
0.10-0.10 0.30-0.30	ES ES					(0.45) 0.45	Grass over dark brown slightly silty slightly clayey gravelly SAND (Topsoil) Gravel is fine to coarse subrounded of quartz and sandstone. Occasional rootlets	
0.70-0.70	ES					(0.50) 0.95	Orange Brown slightly silty gravelly SAND. Gravel is fine to coarse subrounded of sandstone with frequent cobbles of sandstone	
							End of Hole at 0.95m bgl.	

Groundwater Strike Depth: (m) Rising to: (m) Groundwater Remarks	General Remarks	Final Depth
None Encountered		**0.95m bgl**

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

GRONTMIJ WINDOW SAMPLE LOG 2006 ARMITAGE ROAD GINT.GPJ AGS3_ALL.GDT 4/5/11

WINDOW SAMPLE LOG

WINDOW SAMPLE No **WS03**

Project	Client	Logged By
Cannock 2a Armitage Road	Cannock Chase DC	PSW

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
106270	09-12-10 14-12-10			

SAMPLES & TESTS			Water	STRATA				
Depth	Type	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Instrument / Backfill
0.10-0.10	ES					0.15	Grass over dark brown slightly silty slightly clayey gravelly SAND (Topsoil) Gravel is fine to coarse subrounded of quartz and sandstone. Occasional rootlets	
0.30-0.30	ES					(0.90)	Brown slightly silty slightly clayey gravelly SAND. Gravel is fine to coarse subrounded to rounded of quartz and sandstone with occasional cobbles	
0.70-0.70	ES					1.05	End of Hole at 1.05m bgl.	

Groundwater	General Remarks	Final Depth
Strike Depth: (m) Rising to: (m) Groundwater Remarks None Encountered	Refusal on cobble and hole collapsed back in	**1.05m bgl**

Contractor	Method/ Plant Used	
Sherwood Driling	Window Sampler	All dimensions in metres Scale 1:50

Sheet 1 of 1

GRONTMIJ WINDOW SAMPLE LOG 2006 ARMITAGE ROAD GINT.GPJ AGS3_ALL.GDT 4/5/11

HAND PIT LOG

HAND PIT No: HP01

Project	Client	Logged By
Cannock 2a Armitage Road	Cannock Chase DC	PSW

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
106270	09-12-10 09-12-10			

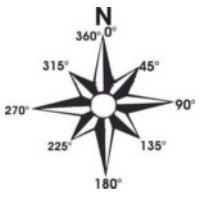
SAMPLES & TESTS			Water	STRATA				
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Backfill
0.10-0.10	ES					0.10	Grass over dark brown slightly silty slightly clayey gravelly SAND (Topsoil) Gravel is fine to coarse subrounded of quartz and sand stone. Occasional rootlets	
0.30-0.30	ES					(0.60)		
0.70-0.70	ES					0.70	MADE GROUND; Brown slightly silty, slightly clayey gravelly SAND. Gravel is fine to coarse sub angular to subrounded of various lithologies with occasional fragments of brick and ash.	
							End of Trial Pit at 0.7m 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		**0.7m bgl**

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

GRONTMIJ HAND PIT LOG ARMITAGE ROAD GINT.GPJ AGS3_ALL.GDT 4/5/11

Grontmij

HAND PIT LOG

HAND PIT No
HP02

Project	Client	Logged By
Cannock 2a Armitage Road	Cannock Chase DC	PSW

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
106270	09-12-10 10-12-10			

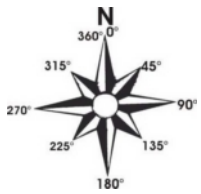
SAMPLES & TESTS			Water	STRATA				
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Backfill
0.10-0.10 0.30-0.30	ES ES					(0.70)	MADE GROUND; Grass over dark brown slightly silty slightly clayey gravelly SAND. Gravel is fine to coarse subrounded of quartz and sandstone. Occasional rootlets and fragments of ash clinker and brick	
0.70-0.70	ES					0.70	End of Trial Pit at 0.7m 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		**0.7m bgl**

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

GRONTMIJ HAND PIT LOG ARMITAGE ROAD GINT.GPJ AGS3_ALL.GDT 4/5/11

HAND PIT LOG

HAND PIT No
HP03

Project	Client	Logged By
Cannock 2a Armitage Road	Cannock Chase DC	PSW

Job No	Date	Ground Level (m)	Co-ordinates	Checked By
106270	09-12-10 11-12-10			

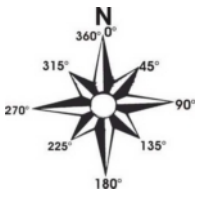
SAMPLES & TESTS			Water	STRATA				
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	Backfill
0.10-0.10	ES					0.10	Grass over dark brown slightly silty slightly clayey gravelly SAND (Topsoil) Gravel is fine to coarse subrounded of quartz and sandstone. Occasional rootlets	
0.30-0.30	ES					0.45	MADE GROUND; Brown slightly clayey slightly silty slightly gravelly SAND. Gravel is fine to coarse subrounded to rounded of quartz with frequent rootlets	
0.70-0.70	ES					0.70	Orange Brown slightly silty gravelly SAND. Gravel is fine to coarse subrounded of sandstone	
							End of Trial Pit at 0.7m 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		**0.7m bgl**

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

GRONTMIJ HAND PIT LOG ARMITAGE ROAD GINT.GPJ AGS3_ALL.GDT 4/5/11

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
41 Corn Street
Bristol
Avon
BS1 1HS

Attention: Gareth Taylor

CERTIFICATE OF ANALYSIS

Date:	13 January 2011
Customer:	H_GRONTMIJ_BRI
Sample Delivery Group (SDG):	101213-103
Your Reference:	
Location:	Armitage Road
Report No:	110767

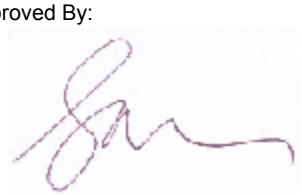
We received 19 samples on Saturday December 11, 2010 and 6 of these samples were scheduled for analysis which was completed on Thursday January 13, 2011. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of 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.

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:



Sonia McWhan

Laboratory Manager

1291
GROUP

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
2573471	HP01		0.10	
2573472	HP01		0.30	
2573474	HP01		0.70	
2573481	HP02		0.10	
2573482	HP02		0.30	
2573483	HP02		0.70	
2573484	HP03		0.10	
2573485	HP03		0.30	
2573487	HP03		0.70	
2573476	WS01		0.10	
2573478	WS01		0.70	
2573479	WS01		1.80	
2573489	WS02		0.10	
2573490	WS02		0.30	
2573491	WS02		0.70	
2573494	WS03		0.10	
2573495	WS03		0.30	
2573496	WS03		0.70	

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

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

Test Schedule

SOLID

Results Legend

X Test

N No Determination Possible

Lab Sample No(s)			2573472		2573477		2573481		2573490		2573485		2573494	
Customer Sample Reference			HP01		WS01		HP02		WS02		HP03		WS03	
AGS Reference														
Depth (m)			0.30		0.30		0.10		0.30		0.30		0.10	
Container			250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	60g VOC	250g Amber Jar	400g Tub	60g VOC	250g Amber Jar	400g Tub	250g Amber Jar	400g Tub	60g VOC	250g Amber Jar	400g Tub
Anions by Kone (soil)	All	NDPs: 0 Tests: 3	X					X				X					
Asbestos Containing Material Screen	All	NDPs: 0 Tests: 4		X		X			X					X			
Boron Water Soluble	All	NDPs: 0 Tests: 6	X		X			X			X					X	
CEN Readings	All	NDPs: 0 Tests: 3		X		X			X								
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 3		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		X
Mercury Dissolved	All	NDPs: 0 Tests: 3		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
	Vanadium	NDPs: 0 Tests: 6	X			X			X			X					X
	Zinc	NDPs: 0 Tests: 6	X			X			X			X					X

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

SOLID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	2573472	2573477	2573481	2573490	2573485	2573494
			Customer Sample Reference	HP01	WS01	HP02	WS02	HP03	WS03
			AGS Reference						
			Depth (m)	0.30	0.30	0.10	0.30	0.30	0.10
			Container	250g Amber Jar	400g Tub	60g VOC	250g Amber Jar	400g Tub	60g VOC	250g Amber Jar	400g Tub	60g VOC	250g Amber Jar	400g Tub	60g VOC	250g Amber Jar	400g Tub
PAH by GCMS	All	NDPs: 0 Tests: 3								X		X				X	
pH	All	NDPs: 0 Tests: 6		X		X		X			X		X				X
Sample description	All	NDPs: 0 Tests: 6	X			X		X			X		X			X	
Semi Volatile Organic Compounds	All	NDPs: 0 Tests: 3	X			X		X									
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 3		X			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: 3			X			X				X					
VOC MS (W)	All	NDPs: 0 Tests: 3		X			X			X							

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
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
2573472	HP01	0.30	Dark Brown	Sand	0.1 - 2 mm	Stones	Vegetation
2573481	HP02	0.10	Dark Brown	Sandy Loam	0.1 - 2 mm	Stones	None
2573485	HP03	0.30	Dark Brown	Sandy Loam	0.1 - 2 mm	Stones	None
2573477	WS01	0.30	Dark Brown	Sandy Loam	0.1 - 2 mm	Stones	None
2573490	WS02	0.30	Dark Brown	Sandy Loam	0.1 - 2 mm	Stones	None
2573494	WS03	0.10	Dark Brown	Top Soil	0.063 - 0.1 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.

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
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 the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample R	HP01	HP02	HP03	WS01	WS02	WS03
			Depth (m)	0.30	0.10	0.30	0.30	0.30	0.10
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid
			Date Sampled	-	-	-	-	-	-
			Date Received	11/12/2010	11/12/2010	11/12/2010	11/12/2010	11/12/2010	11/12/2010
			SDG Ref	101213-103	101213-103	101213-103	101213-103	101213-103	101213-103
			Lab Sample No.(s)	2573472	2573481	2573485	2573477	2573490	2573494
			AGS Reference						
Moisture	%	PM114		16.2	17.1		18.5		
Moisture content ratio	%	PM114		19.4	20.6		22.6		
Dry matter content ratio	%	PM114		83.8	82.9		81.6		
Asbestos Containing Material Screen	-	TM001		No ACM Detected	No ACM Detected	No ACM Detected	No ACM Detected		
Soil Organic Matter (SOM)	<0.35 %	TM132		7.26 #	4.86 #	3.1 #	4.53 #	4.59 #	4.59 #
pH	1 pH Units	TM133		8.13 M	7.64 M	7.29 M	8.56 M	6.61 M	6.96 M
Chromium, Hexavalent	<0.6 mg/kg	TM151		<0.6 #	<0.6 #	<0.6 #	<0.6 #	<1.2 #	<1.2 #
Arsenic	<0.6 mg/kg	TM181		13.7 M	11.4 M	15 M	11 M	15.6 M	14.4 M
Barium	<0.6 mg/kg	TM181		142 #	153 #	155 #	118 #	221 #	173 #
Beryllium	<0.01 mg/kg	TM181		1.82 M	1.3 M	0.69 M	0.825 M	1.01 M	1.16 M
Cadmium	<0.02 mg/kg	TM181		1.01 M	2.41 M	0.919 M	0.996 M	1.1 M	0.766 M
Chromium	<0.9 mg/kg	TM181		11.3 M	20.4 M	13.5 M	12.3 M	15.6 M	13.4 M
Copper	<1.4 mg/kg	TM181		30.5 M	33.7 M	25.5 M	36.3 M	34.4 M	28 M
Lead	<0.7 mg/kg	TM181		92.8 M	243 M	110 M	78.2 M	99.3 M	90.7 M
Mercury	<0.14 mg/kg	TM181		<0.14 M	<0.14 M	<0.14 M	<0.14 M	0.173 M	0.18 M
Nickel	<0.2 mg/kg	TM181		23.6 M	26.6 M	12.8 M	18.3 M	18.3 M	16.8 M
Selenium	<1 mg/kg	TM181		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Vanadium	<0.2 mg/kg	TM181		20.7 #	23.5 #	20.3 #	17.1 #	49.5 #	21.7 #
Zinc	<1.9 mg/kg	TM181		171 M	746 M	185 M	134 M	245 M	132 M
Boron, water soluble	<1 mg/kg	TM222		1.39 M	1.05 M	<1 M	<1 M	<1 M	<1 M
Water Soluble Sulphate as SO4 2:1 Extract	<0.008 g/l	TM243		0.0266 M	0.0778 M	<0.008 M			

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
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 the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample R	HP03	WS02	WS03			
			Depth (m)	0.30	0.30	0.10			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	-	-	-			
			Date Received	11/12/2010	11/12/2010	11/12/2010			
			SDG Ref	101213-103	101213-103	101213-103			
			Lab Sample No.(s)	2573485	2573490	2573494			
			AGS Reference						
Naphthalene-d8 % recovery**	%	TM218		95.4	103	97.6			
Acenaphthene-d10 % recovery**	%	TM218		93.9	104	97.6			
Phenanthrene-d10 % recovery**	%	TM218		91.7	106	100			
Chrysene-d12 % recovery**	%	TM218		89.2	102	96			
Perylene-d12 % recovery**	%	TM218		89.8	103	98.8			
Naphthalene	<9 µg/kg	TM218		47.8 M	166 M	57.4 M			
Acenaphthylene	<12 µg/kg	TM218		66.9 M	94.6 M	34.8 M			
Acenaphthene	<8 µg/kg	TM218		48.9 M	278 M	10.4 M			
Fluorene	<10 µg/kg	TM218		40.6 M	193 M	19.5 M			
Phenanthrene	<15 µg/kg	TM218		679 M	4630 M	440 M			
Anthracene	<16 µg/kg	TM218		150 M	1060 M	122 M			
Fluoranthene	<17 µg/kg	TM218		1520 M	8870 M	1320 M			
Pyrene	<15 µg/kg	TM218		1230 M	6820 M	1100 M			
Benz(a)anthracene	<14 µg/kg	TM218		645 M	3680 M	605 M			
Chrysene	<10 µg/kg	TM218		712 M	3360 M	622 M			
Benzo(b)fluoranthene	<15 µg/kg	TM218		834 M	4670 M	938 M			
Benzo(k)fluoranthene	<14 µg/kg	TM218		372 M	1640 M	365 M			
Benzo(a)pyrene	<15 µg/kg	TM218		766 M	3490 M	653 M			
Indeno(1,2,3-cd)pyrene	<18 µg/kg	TM218		514 M	1860 M	412 M			
Dibenzo(a,h)anthracene	<23 µg/kg	TM218		143 M	588 M	110 M			
Benzo(g,h,i)perylene	<24 µg/kg	TM218		626 M	2050 M	504 M			
Polyaromatic hydrocarbons, Total	<118 µg/kg	TM218		8400 M	43500 M	7310 M			

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

Semi Volatile Organic Compounds

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 the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample R	HP01	HP02	WS01			
			Depth (m)	0.30	0.10	0.30			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	-	-	-			
			Date Received	11/12/2010	11/12/2010	11/12/2010			
			SDG Ref	101213-103	101213-103	101213-103			
			Lab Sample No.(s)	2573472	2573481	2573477			
			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	<100	<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	<100			
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			

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

Semi Volatile Organic Compounds

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 the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample R	HP01	HP02	WS01			
			Depth (m)	0.30	0.10	0.30			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	-	-	-			
			Date Received	11/12/2010	11/12/2010	11/12/2010			
			SDG Ref	101213-103	101213-103	101213-103			
			Lab Sample No.(s)	2573472	2573481	2573477			
			AGS Reference						
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			
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	<100	<100			
Acenaphthylene	<100 µg/kg	TM157		<100	<100	117			
Acenaphthene	<100 µg/kg	TM157		<100	<100	<100			
Anthracene	<100 µg/kg	TM157		<100	142	252			
Benzo(a)anthracene	<100 µg/kg	TM157		238	888	2100			
Benzo(b)fluoranthene	<100 µg/kg	TM157		271	1050	2260			
Benzo(k)fluoranthene	<100 µg/kg	TM157		221	788	1960			
Benzo(a)pyrene	<100 µg/kg	TM157		299	1040	2490			
Benzo(g,h,i)perylene	<100 µg/kg	TM157		204	686	1550			
Chrysene	<100 µg/kg	TM157		276	960	2060			
Fluoranthene	<100 µg/kg	TM157		468	1730	3350			
Fluorene	<100 µg/kg	TM157		<100	<100	<100			
Indeno(1,2,3-cd)pyrene	<100 µg/kg	TM157		175	637	1540			
Phenanthrene	<100 µg/kg	TM157		235	648	645			
Pyrene	<100 µg/kg	TM157		444	1570	3160			
Naphthalene	<100 µg/kg	TM157		<100	<100	<100			
Dibenzo(a,h)anthracene	<100 µg/kg	TM157		<100	132	352			

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

TPH CWG (S)

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 the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample R	HP03	WS01				
			Depth (m)	0.30	0.30				
			Sample Type	Soil/Solid	Soil/Solid				
			Date Sampled	-	-				
			Date Received	11/12/2010	11/12/2010				
			SDG Ref	101213-103	101213-103				
			Lab Sample No.(s)	2573485	2573477				
			AGS Reference						
GRO Surrogate % recovery**	%	TM089		75	45				
GRO >C5-C12	<44 µg/kg	TM089		<44	<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		<2 M	<2 M				
Ethylbenzene	<3 µg/kg	TM089		<3 M	<3 M				
m,p-Xylene	<6 µg/kg	TM089		<6 M	<6 M				
o-Xylene	<3 µg/kg	TM089		<3 M	<3 M				
m,p,o-Xylene	<10 µg/kg	TM089		<10	<10				
BTEX, Total	<10 µg/kg	TM089		<10	<10				
Aliphatics >C5-C6	<10 µg/kg	TM089		<10	<10				
Aliphatics >C6-C8	<10 µg/kg	TM089		<10	<10				
Aliphatics >C8-C10	<10 µg/kg	TM089		<10	<10				
Aliphatics >C10-C12	<10 µg/kg	TM089		<10	<10				
Aliphatics >C12-C16	<100 µg/kg	TM173		2070	2500				
Aliphatics >C16-C21	<100 µg/kg	TM173		3600	3950				
Aliphatics >C21-C35	<100 µg/kg	TM173		8660	22100				
Aliphatics >C35-C44	<100 µg/kg	TM173		1180	6220				
Total Aliphatics >C12-C44	<100 µg/kg	TM173		15500	34800				
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		<10	<10				
Aromatics >EC10-EC12	<10 µg/kg	TM089		<10	<10				
Aromatics >EC12-EC16	<100 µg/kg	TM173		1360	4930				
Aromatics >EC16-EC21	<100 µg/kg	TM173		6260	34000				
Aromatics >EC21-EC35	<100 µg/kg	TM173		31000	119000				
Aromatics >EC35-EC44	<100 µg/kg	TM173		8810	35700				
Aromatics >EC40-EC44	<100 µg/kg	TM173		3240	12500				
Total Aromatics >EC12-EC44	<100 µg/kg	TM173		47500	193000				
Total Aliphatics & Aromatics >C5-C44	<100 µg/kg	TM173		63000	228000				
Total Aliphatics >C5-35	<100 µg/kg	TM173		14300	28600				
Total Aromatics >C5-35	<100 µg/kg	TM173		38700	158000				
Total Aliphatics & Aromatics >C5-35	<100 µg/kg	TM173		53000	186000				

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

VOC MS (S)

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 the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample R	HP01	HP02	WS01			
			Depth (m)	0.30	0.10	0.30			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	-	-	-			
			Date Received	11/12/2010	11/12/2010	11/12/2010			
			SDG Ref	101213-103	101213-103	101213-103			
			Lab Sample No.(s)	2573472	2573481	2573477			
			AGS Reference						
Dibromofluoromethane**	%	TM116		134	114	114			
Toluene-d8**	%	TM116		94.5	92.7	96			
4-Bromofluorobenzene**	%	TM116		131	139	137			
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	<7 M	<7 M			
Dichloromethane	<10 µg/kg	TM116		60.6 #	59.7 #	62.7 #			
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		36.2 M	13.5 M	135 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		13.1 M	11.1 M	52.2 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	<5 M	<5 M			
Dibromochloromethane	<13 µg/kg	TM116		<13 M	<13 M	<13 M			

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

VOC MS (S)

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 the individual compounds within the samples are not corrected for this recovery.

Component	LOD/Units	Method	Customer Sample R	HP01	HP02	WS01			
			Depth (m)	0.30	0.10	0.30			
			Sample Type	Soil/Solid	Soil/Solid	Soil/Solid			
			Date Sampled	-	-	-			
			Date Received	11/12/2010	11/12/2010	11/12/2010			
			SDG Ref	101213-103	101213-103	101213-103			
			Lab Sample No.(s)	2573472	2573481	2573477			
			AGS Reference						
1.2-Dibromoethane	<12 µg/kg	TM116		<12 M	<12 M	<12 M			
Chlorobenzene	<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	<4 M	16.2 M			
p/m-Xylene	<14 µg/kg	TM116		<14 #	<14 #	<14 #			
o-Xylene	<10 µg/kg	TM116		<10 M	<10 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	<5 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	<11 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	<13 M	<13 M			
1.2.3-Trichlorobenzene	<6 µg/kg	TM116		<6 M	<6 M	<6 M			

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

CEN 2:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/1

Client Reference		**Site Location**	Armitage Road
Mass Sample taken (kg)	0.209	**Moisture Content Ratio (%)**	19.4
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	83.8
Particle Size <4mm	>95%		

Case				
SDG	101213-103			
Lab Sample Number(s)	2573472			
Sampled Date				
Customer Sample Ref.	HP01			
Depth (m)	0.30			

Solid Waste Analysis

Total Organic Carbon (%)	4.21	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	8.13	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis

	Concⁿ in 2:1 eluate (mg/l)		2:1 concⁿ leached (mg/kg)		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	0.00455	<0.00012	0.0091	<0.0012	0.5	2	25
Barium	-	-	-	-	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.00459	<0.00022	0.00918	<0.0022	0.5	10	70
Copper	0.0029	<0.00085	0.0058	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2
Molybdenum	-	-	-	-	0.5	10	30
Nickel	0.00121	<0.00015	0.00242	<0.0015	0.4	10	40
Lead	0.000808	<0.00002	0.00162	<0.0002	0.5	10	50
Antimony	-	-	-	-	0.06	0.7	5
Selenium	-	-	-	-	0.1	0.5	7
Zinc	0.00553	<0.00041	0.0111	<0.0041	4	50	200
Chloride	-	-	-	-	800	15000	25000
Fluoride	-	-	-	-	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	-	-	-	-	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information

Date Prepared	06-Jan-2011
pH (pH Units)	8.19
Conductivity (µS/cm)	221.00
Temperature (°C)	13.30
Volume Leachant (Litres)	0.316
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
13/01/2011 06:34:32

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

CEN 2:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/1

Client Reference		**Site Location**	Armitage Road
Mass Sample taken (kg)	0.209	**Moisture Content Ratio (%)**	19.4
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	83.8
Particle Size <4mm	>95%		

Case				
SDG	101213-103			
Lab Sample Number(s)	2573472			
Sampled Date				
Customer Sample Ref.	HP01			
Depth (m)	0.30			

Solid Waste Analysis

Total Organic Carbon (%)	4.21	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	8.13	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**Concⁿ in 2:1 eluate (mg/l)**		**2:1 concⁿ leached (mg/kg)**		**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**			
Boron	0.109	<0.0094	0.218	<0.094	-	-	-
Vanadium	0.00558	<0.00024	0.0112	<0.0024	-	-	-
SVOC MS (W) - Aqueous							
1,2,4-Trichlorobenzene	<0.0023	<0.0023	<0.0046	<0.023	-	-	-
1,2-Dichlorobenzene	<0.0037	<0.0037	<0.0074	<0.037	-	-	-
1,3-Dichlorobenzene	<0.0022	<0.0022	<0.0044	<0.022	-	-	-
1,4-Dichlorobenzene	<0.0027	<0.0027	<0.0054	<0.027	-	-	-
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-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-Bromophenylphenylether	<0.001	<0.001	<0.002	<0.01	-	-	-
4-Chloro-3-methylphenol	<0.001	<0.001	<0.002	<0.01	-	-	-
4-Chloroaniline	<0.001	<0.001	<0.002	<0.01	-	-	-

Leach Test Information

Date Prepared	06-Jan-2011
pH (pH Units)	8.19
Conductivity (µS/cm)	221.00
Temperature (°C)	13.30
Volume Leachant (Litres)	0.316
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
13/01/2011 06:34:32

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

CEN 2:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/1

Client Reference		**Site Location**	Armitage Road
Mass Sample taken (kg)	0.209	**Moisture Content Ratio (%)**	19.4
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	83.8
Particle Size <4mm	>95%		

Case				
SDG	101213-103			
Lab Sample Number(s)	2573472			
Sampled Date				
Customer Sample Ref.	HP01			
Depth (m)	0.30			

Solid Waste Analysis

Total Organic Carbon (%)	4.21	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	8.13	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis

	Conc^{n} in 2:1 eluate (mg/l)		2:1 conc^{n} leached (mg/kg)		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			
SVOC MS (W) - Aqueous							
4-Chlorophenylphenylether	<0.001	<0.001	<0.002	<0.01	-	-	-
4-Methylphenol	<0.001	<0.001	<0.002	<0.01	-	-	-
4-Nitrophenol	<0.001	<0.001	<0.002	<0.01	-	-	-
4-Nitroaniline	<0.001	<0.001	<0.002	<0.01	-	-	-
Azobenzene	<0.001	<0.001	<0.002	<0.01	-	-	-
Acenaphthylene	<0.001	<0.001	<0.002	<0.01	-	-	-
Acenaphthene	<0.001	<0.001	<0.002	<0.01	-	-	-
Anthracene	<0.001	<0.001	<0.002	<0.01	-	-	-
Bis(2-chloroethyl)ether	<0.001	<0.001	<0.002	<0.01	-	-	-
Bis(2-chloroethoxy)methane	<0.001	<0.001	<0.002	<0.01	-	-	-
Bis(2-ethylhexyl) phthalate	<0.002	<0.002	<0.004	<0.02	-	-	-
Benzo(a)anthracene	<0.001	<0.001	<0.002	<0.01	-	-	-
Butylbenzyl phthalate	<0.001	<0.001	<0.002	<0.01	-	-	-
Benzo(b)fluoranthene	<0.001	<0.001	<0.002	<0.01	-	-	-
Benzo(k)fluoranthene	<0.001	<0.001	<0.002	<0.01	-	-	-
Benzo(a)pyrene	<0.001	<0.001	<0.002	<0.01	-	-	-
Benzo(ghi)perylene	<0.001	<0.001	<0.002	<0.01	-	-	-
Carbazole	<0.001	<0.001	<0.002	<0.01	-	-	-
Chrysene	<0.001	<0.001	<0.002	<0.01	-	-	-
Dibenzofuran	<0.001	<0.001	<0.002	<0.01	-	-	-
Di-n-butyl phthalate	<0.001	<0.001	<0.002	<0.01	-	-	-
Diethyl phthalate	<0.001	<0.001	<0.002	<0.01	-	-	-

Leach Test Information

Date Prepared	06-Jan-2011
pH (pH Units)	8.19
Conductivity (µS/cm)	221.00
Temperature (°C)	13.30
Volume Leachant (Litres)	0.316
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
13/01/2011 06:34:32

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

CEN 2:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/1

Client Reference		**Site Location**	Armitage Road
Mass Sample taken (kg)	0.209	**Moisture Content Ratio (%)**	19.4
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	83.8
Particle Size <4mm	>95%		

Case				
SDG	101213-103			
Lab Sample Number(s)	2573472			
Sampled Date				
Customer Sample Ref.	HP01			
Depth (m)	0.30			

Solid Waste Analysis

Total Organic Carbon (%)	4.21	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	8.13	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis

	Concⁿ in 2:1 eluate (mg/l)		2:1 concⁿ leached (mg/kg)		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			
SVOC MS (W) - Aqueous							
Dibenzo(a,h)anthracene	<0.001	<0.001	<0.002	<0.01	-	-	-
Dimethyl phthalate	<0.001	<0.001	<0.002	<0.01	-	-	-
Di-n-Octyl phthalate	<0.005	<0.005	<0.01	<0.05	-	-	-
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	-	-	-
Pentachlorophenol	<0.001	<0.001	<0.002	<0.01	-	-	-
Phenol	<0.001	<0.001	<0.002	<0.01	-	-	-
N-nitrosodi-n-propylamine	<0.001	<0.001	<0.002	<0.01	-	-	-
Hexachloroethane	<0.001	<0.001	<0.002	<0.01	-	-	-
Nitrobenzene	<0.001	<0.001	<0.002	<0.01	-	-	-
Naphthalene	<0.0035	<0.0035	<0.007	<0.035	-	-	-
Isophorone	0.00106	<0.001	0.00212	<0.01	-	-	-
Hexachlorocyclopentadiene	<0.001	<0.001	<0.002	<0.01	-	-	-
Phenanthrene	<0.001	<0.001	<0.002	<0.01	-	-	-
Indeno (1,2,3-cd) Pyrene	<0.001	<0.001	<0.002	<0.01	-	-	-
Pyrene	<0.001	<0.001	<0.002	<0.01	-	-	-
VOC MS (W)							
Dibromofluoromethane	-	-	-	-	-	-	-
Toluene-d8	-	-	-	-	-	-	-
4-Bromofluorobenzene	-	-	-	-	-	-	-
Dichlorodifluoromethane	<0.007	<0.007	<0.014	<0.07	-	-	-

Leach Test Information

Date Prepared	06-Jan-2011
pH (pH Units)	8.19
Conductivity (µS/cm)	221.00
Temperature (°C)	13.30
Volume Leachant (Litres)	0.316
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
13/01/2011 06:34:32

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

CEN 2:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/1

Client Reference		**Site Location**	Armitage Road
Mass Sample taken (kg)	0.209	**Moisture Content Ratio (%)**	19.4
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	83.8
Particle Size <4mm	>95%		

Case				
SDG	101213-103			
Lab Sample Number(s)	2573472			
Sampled Date				
Customer Sample Ref.	HP01			
Depth (m)	0.30			

Solid Waste Analysis

Total Organic Carbon (%)	4.21	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	8.13	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**Concⁿ in 2:1 eluate (mg/l)**		**2:1 concⁿ leached (mg/kg)**		**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**			
VOC MS (W)							
Chloromethane	<0.009	<0.009	<0.018	<0.09	-	-	-
Vinyl Chloride	<0.0012	<0.0012	<0.0024	<0.012	-	-	-
Bromomethane	<0.002	<0.002	<0.004	<0.02	-	-	-
Chloroethane	<0.0025	<0.0025	<0.005	<0.025	-	-	-
Trichlorofluoromethane	<0.0013	<0.0013	<0.0026	<0.013	-	-	-
1,1-Dichloroethene	<0.0012	<0.0012	<0.0024	<0.012	-	-	-
Carbon Disulphide	<0.0013	<0.0013	<0.0026	<0.013	-	-	-
Dichloromethane	<0.0037	<0.0037	<0.0074	<0.037	-	-	-
Tert-butyl methyl ether	<0.0016	<0.0016	<0.0032	<0.016	-	-	-
Trans-1,2-Dichloroethene	<0.0019	<0.0019	<0.0038	<0.019	-	-	-
1,1-Dichloroethane	<0.0012	<0.0012	<0.0024	<0.012	-	-	-
Cis-1,2-Dichloroethene	<0.0023	<0.0023	<0.0046	<0.023	-	-	-
2,2-Dichloropropane	<0.0038	<0.0038	<0.0076	<0.038	-	-	-
Bromochloromethane	<0.0019	<0.0019	<0.0038	<0.019	-	-	-
Chloroform	<0.0018	<0.0018	<0.0036	<0.018	-	-	-
1,1,1-Trichloroethane	<0.0013	<0.0013	<0.0026	<0.013	-	-	-
1,1-Dichloropropene	<0.0013	<0.0013	<0.0026	<0.013	-	-	-
Carbontetrachloride	<0.0014	<0.0014	<0.0028	<0.014	-	-	-
1,2-Dichloroethane	<0.0033	<0.0033	<0.0066	<0.033	-	-	-
Benzene	<0.0013	<0.0013	<0.0026	<0.013	-	-	-
Trichloroethene	<0.0025	<0.0025	<0.005	<0.025	-	-	-
1,2-Dichloropropane	<0.003	<0.003	<0.006	<0.03	-	-	-

Leach Test Information

Date Prepared	06-Jan-2011
pH (pH Units)	8.19
Conductivity (µS/cm)	221.00
Temperature (°C)	13.30
Volume Leachant (Litres)	0.316
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
13/01/2011 06:34:32

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

CEN 2:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/1

Client Reference		**Site Location**	Armitage Road
Mass Sample taken (kg)	0.209	**Moisture Content Ratio (%)**	19.4
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	83.8
Particle Size <4mm	>95%		

Case				
SDG	101213-103			
Lab Sample Number(s)	2573472			
Sampled Date				
Customer Sample Ref.	HP01			
Depth (m)	0.30			

Solid Waste Analysis

Total Organic Carbon (%)	4.21	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	8.13	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis

	Conc^{n} in 2:1 eluate (mg/l)		2:1 conc^{n} leached (mg/kg)		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			
VOC MS (W)							
Dibromomethane	<0.0027	<0.0027	<0.0054	<0.027	-	-	-
Bromodichloromethane	<0.0009	<0.0009	<0.0018	<0.009	-	-	-
Cis-1,3-Dichloropropene	<0.0019	<0.0019	<0.0038	<0.019	-	-	-
Toluene	<0.0014	<0.0014	<0.0028	<0.014	-	-	-
Trans-1,3-Dichloropropene	<0.0035	<0.0035	<0.007	<0.035	-	-	-
1,1,2-Trichloroethane	<0.0022	<0.0022	<0.0044	<0.022	-	-	-
1,3-Dichloropropane	<0.0022	<0.0022	<0.0044	<0.022	-	-	-
Tetrachloroethene	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Dibromochloromethane	<0.0017	<0.0017	<0.0034	<0.017	-	-	-
1,2-Dibromoethane	<0.0023	<0.0023	<0.0046	<0.023	-	-	-
Chlorobenzene	<0.0035	<0.0035	<0.007	<0.035	-	-	-
1,1,1,2-Tetrachloroethane	<0.0013	<0.0013	<0.0026	<0.013	-	-	-
Ethylbenzene	<0.0025	<0.0025	<0.005	<0.025	-	-	-
p/m-Xylene	<0.0025	<0.0025	<0.005	<0.025	-	-	-
o-Xylene	<0.0017	<0.0017	<0.0034	<0.017	-	-	-
Styrene	<0.0012	<0.0012	<0.0024	<0.012	-	-	-
Bromoform	<0.003	<0.003	<0.006	<0.03	-	-	-
Isopropylbenzene	<0.0014	<0.0014	<0.0028	<0.014	-	-	-
1,1,2,2-Tetrachloroethane	<0.0052	<0.0052	<0.0104	<0.052	-	-	-
1,2,3-Trichloropropane	<0.0078	<0.0078	<0.0156	<0.078	-	-	-
Bromobenzene	<0.002	<0.002	<0.004	<0.02	-	-	-
Propylbenzene	<0.0026	<0.0026	<0.0052	<0.026	-	-	-

Leach Test Information

Date Prepared	06-Jan-2011
pH (pH Units)	8.19
Conductivity (µS/cm)	221.00
Temperature (°C)	13.30
Volume Leachant (Litres)	0.316
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
13/01/2011 06:34:32

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

CEN 2:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/1

Client Reference		**Site Location**	Armitage Road
Mass Sample taken (kg)	0.209	**Moisture Content Ratio (%)**	19.4
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	83.8
Particle Size <4mm	>95%		

Case				
SDG	101213-103			
Lab Sample Number(s)	2573472			
Sampled Date				
Customer Sample Ref.	HP01			
Depth (m)	0.30			

Solid Waste Analysis

Total Organic Carbon (%)	4.21	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	8.13	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis

	Conc^{n} in 2:1 eluate (mg/l)		2:1 conc^{n} leached (mg/kg)		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			
VOC MS (W)							
2-Chlorotoluene	<0.0019	<0.0019	<0.0038	<0.019	-	-	-
1,3,5-Trimethylbenzene	<0.0018	<0.0018	<0.0036	<0.018	-	-	-
4-Chlorotoluene	<0.0019	<0.0019	<0.0038	<0.019	-	-	-
Tert-Butylbenzene	<0.002	<0.002	<0.004	<0.02	-	-	-
1,2,4-Trimethylbenzene	<0.0017	<0.0017	<0.0034	<0.017	-	-	-
Sec-Butylbenzene	<0.0017	<0.0017	<0.0034	<0.017	-	-	-
4-Isopropyltoluene	<0.0026	<0.0026	<0.0052	<0.026	-	-	-
1,3-Dichlorobenzene	<0.0022	<0.0022	<0.0044	<0.022	-	-	-
1,4-Dichlorobenzene	<0.0027	<0.0027	<0.0054	<0.027	-	-	-
n-Butylbenzene	<0.002	<0.002	<0.004	<0.02	-	-	-
1,2-Dichlorobenzene	<0.0037	<0.0037	<0.0074	<0.037	-	-	-
1,2-Dibromo-3-Chloropropane	<0.0098	<0.0098	<0.0196	<0.098	-	-	-
1,2,4-Trichlorobenzene	<0.0023	<0.0023	<0.0046	<0.023	-	-	-
Hexachlorobutadiene	<0.0025	<0.0025	<0.005	<0.025	-	-	-
Tert-amyl methyl ether	<0.001	<0.001	<0.002	<0.01	-	-	-
Naphthalene	<0.0035	<0.0035	<0.007	<0.035	-	-	-
1,2,3-Trichlorobenzene	<0.0031	<0.0031	<0.0062	<0.031	-	-	-
1,3,5-Trichlorobenzene	<0.01	<0.01	<0.02	<0.1	-	-	-

Leach Test Information

Date Prepared	06-Jan-2011
pH (pH Units)	8.19
Conductivity (µS/cm)	221.00
Temperature (°C)	13.30
Volume Leachant (Litres)	0.316
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
13/01/2011 06:34:32

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

CEN 2:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/1

Client Reference		**Site Location**	Armitage Road
Mass Sample taken (kg)	0.215	**Moisture Content Ratio (%)**	22.6
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	81.6
Particle Size <4mm	>95%		

Case				
SDG	101213-103			
Lab Sample Number(s)	2573477			
Sampled Date				
Customer Sample Ref.	WS01			
Depth (m)	0.30			

Solid Waste Analysis

Total Organic Carbon (%)	2.63	-	-	-
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)	8.56	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis

	Concⁿ in 2:1 eluate (mg/l)		2:1 concⁿ leached (mg/kg)		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	0.00565	<0.00012	0.0113	<0.0012	0.5	2	25
Barium	-	-	-	-	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.00435	<0.00022	0.0087	<0.0022	0.5	10	70
Copper	0.0072	<0.00085	0.0144	<0.0085	2	50	100
Mercury Dissolved (CVAF)	0.0000134	<0.00001	0.0000268	<0.0001	0.01	0.2	2
Molybdenum	-	-	-	-	0.5	10	30
Nickel	0.0017	<0.00015	0.0034	<0.0015	0.4	10	40
Lead	0.00176	<0.00002	0.00352	<0.0002	0.5	10	50
Antimony	-	-	-	-	0.06	0.7	5
Selenium	-	-	-	-	0.1	0.5	7
Zinc	0.00392	<0.00041	0.00784	<0.0041	4	50	200
Chloride	-	-	-	-	800	15000	25000
Fluoride	-	-	-	-	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	-	-	-	-	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information

Date Prepared	06-Jan-2011
pH (pH Units)	7.74
Conductivity (µS/cm)	205.00
Temperature (°C)	14.00
Volume Leachant (Litres)	0.310
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
13/01/2011 06:34:32

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

CEN 2:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/1

Client Reference		**Site Location**	Armitage Road
Mass Sample taken (kg)	0.215	**Moisture Content Ratio (%)**	22.6
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	81.6
Particle Size <4mm	>95%		

Case				
SDG	101213-103			
Lab Sample Number(s)	2573477			
Sampled Date				
Customer Sample Ref.	WS01			
Depth (m)	0.30			

Solid Waste Analysis

Total Organic Carbon (%)	2.63	-	-	-
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)	8.56	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**Concⁿ in 2:1 eluate (mg/l)**		**2:1 concⁿ leached (mg/kg)**		**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**			
Boron	0.0395	<0.0094	0.079	<0.094	-	-	-
Vanadium	0.00456	<0.00024	0.00912	<0.0024	-	-	-
SVOC MS (W) - Aqueous							
1,2,4-Trichlorobenzene	<0.0023	<0.0023	<0.0046	<0.023	-	-	-
1,2-Dichlorobenzene	<0.0037	<0.0037	<0.0074	<0.037	-	-	-
1,3-Dichlorobenzene	<0.0022	<0.0022	<0.0044	<0.022	-	-	-
1,4-Dichlorobenzene	<0.0027	<0.0027	<0.0054	<0.027	-	-	-
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-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-Bromophenylphenylether	<0.001	<0.001	<0.002	<0.01	-	-	-
4-Chloro-3-methylphenol	<0.001	<0.001	<0.002	<0.01	-	-	-
4-Chloroaniline	<0.001	<0.001	<0.002	<0.01	-	-	-

Leach Test Information

Date Prepared	06-Jan-2011
pH (pH Units)	7.74
Conductivity (µS/cm)	205.00
Temperature (°C)	14.00
Volume Leachant (Litres)	0.310
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

13/01/2011 06:34:32

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

CEN 2:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/1

Client Reference		**Site Location**	Armitage Road
Mass Sample taken (kg)	0.215	**Moisture Content Ratio (%)**	22.6
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	81.6
Particle Size <4mm	>95%		

Case				
SDG	101213-103			
Lab Sample Number(s)	2573477			
Sampled Date				
Customer Sample Ref.	WS01			
Depth (m)	0.30			

Solid Waste Analysis

Total Organic Carbon (%)	2.63	-	-	-
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)	8.56	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis

	Concⁿ in 2:1 eluate (mg/l)		2:1 concⁿ leached (mg/kg)		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			
SVOC MS (W) - Aqueous							
4-Chlorophenylphenylether	<0.001	<0.001	<0.002	<0.01	-	-	-
4-Methylphenol	<0.001	<0.001	<0.002	<0.01	-	-	-
4-Nitrophenol	<0.001	<0.001	<0.002	<0.01	-	-	-
4-Nitroaniline	<0.001	<0.001	<0.002	<0.01	-	-	-
Azobenzene	<0.001	<0.001	<0.002	<0.01	-	-	-
Acenaphthylene	<0.001	<0.001	<0.002	<0.01	-	-	-
Acenaphthene	<0.001	<0.001	<0.002	<0.01	-	-	-
Anthracene	<0.001	<0.001	<0.002	<0.01	-	-	-
Bis(2-chloroethyl)ether	<0.001	<0.001	<0.002	<0.01	-	-	-
Bis(2-chloroethoxy)methane	<0.001	<0.001	<0.002	<0.01	-	-	-
Bis(2-ethylhexyl) phthalate	<0.002	<0.002	<0.004	<0.02	-	-	-
Benzo(a)anthracene	<0.001	<0.001	<0.002	<0.01	-	-	-
Butylbenzyl phthalate	<0.001	<0.001	<0.002	<0.01	-	-	-
Benzo(b)fluoranthene	<0.001	<0.001	<0.002	<0.01	-	-	-
Benzo(k)fluoranthene	<0.001	<0.001	<0.002	<0.01	-	-	-
Benzo(a)pyrene	<0.001	<0.001	<0.002	<0.01	-	-	-
Benzo(ghi)perylene	<0.001	<0.001	<0.002	<0.01	-	-	-
Carbazole	<0.001	<0.001	<0.002	<0.01	-	-	-
Chrysene	<0.001	<0.001	<0.002	<0.01	-	-	-
Dibenzofuran	<0.001	<0.001	<0.002	<0.01	-	-	-
Di-n-butyl phthalate	<0.001	<0.001	<0.002	<0.01	-	-	-
Diethyl phthalate	<0.001	<0.001	<0.002	<0.01	-	-	-

Leach Test Information

Date Prepared	06-Jan-2011
pH (pH Units)	7.74
Conductivity (µS/cm)	205.00
Temperature (°C)	14.00
Volume Leachant (Litres)	0.310
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
13/01/2011 06:34:32

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

CEN 2:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/1

Client Reference		**Site Location**	Armitage Road
Mass Sample taken (kg)	0.215	**Moisture Content Ratio (%)**	22.6
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	81.6
Particle Size <4mm	>95%		

Case				
SDG	101213-103			
Lab Sample Number(s)	2573477			
Sampled Date				
Customer Sample Ref.	WS01			
Depth (m)	0.30			

Solid Waste Analysis

Total Organic Carbon (%)	2.63	-	-	-
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)	8.56	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis

	Conc^{n} in 2:1 eluate (mg/l)		2:1 conc^{n} leached (mg/kg)		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			
SVOC MS (W) - Aqueous							
Dibenzo(a,h)anthracene	<0.001	<0.001	<0.002	<0.01	-	-	-
Dimethyl phthalate	<0.001	<0.001	<0.002	<0.01	-	-	-
Di-n-Octyl phthalate	<0.005	<0.005	<0.01	<0.05	-	-	-
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	-	-	-
Pentachlorophenol	<0.001	<0.001	<0.002	<0.01	-	-	-
Phenol	<0.001	<0.001	<0.002	<0.01	-	-	-
N-nitrosodi-n-propylamine	<0.001	<0.001	<0.002	<0.01	-	-	-
Hexachloroethane	<0.001	<0.001	<0.002	<0.01	-	-	-
Nitrobenzene	<0.001	<0.001	<0.002	<0.01	-	-	-
Naphthalene	<0.0035	<0.0035	<0.007	<0.035	-	-	-
Isophorone	<0.001	<0.001	<0.002	<0.01	-	-	-
Hexachlorocyclopentadiene	<0.001	<0.001	<0.002	<0.01	-	-	-
Phenanthrene	<0.001	<0.001	<0.002	<0.01	-	-	-
Indeno (1,2,3-cd) Pyrene	<0.001	<0.001	<0.002	<0.01	-	-	-
Pyrene	<0.001	<0.001	<0.002	<0.01	-	-	-
VOC MS (W)							
Dibromofluoromethane	-	-	-	-	-	-	-
Toluene-d8	-	-	-	-	-	-	-
4-Bromofluorobenzene	-	-	-	-	-	-	-
Dichlorodifluoromethane	<0.007	<0.007	<0.014	<0.07	-	-	-

Leach Test Information

Date Prepared	06-Jan-2011
pH (pH Units)	7.74
Conductivity (µS/cm)	205.00
Temperature (°C)	14.00
Volume Leachant (Litres)	0.310
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
13/01/2011 06:34:32

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

CEN 2:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/1

Client Reference		**Site Location**	Armitage Road
Mass Sample taken (kg)	0.215	**Moisture Content Ratio (%)**	22.6
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	81.6
Particle Size <4mm	>95%		

Case				
SDG	101213-103			
Lab Sample Number(s)	2573477			
Sampled Date				
Customer Sample Ref.	WS01			
Depth (m)	0.30			

Solid Waste Analysis

Total Organic Carbon (%)	2.63	-	-	-
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)	8.56	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis

	Conc^{n} in 2:1 eluate (mg/l)		2:1 conc^{n} leached (mg/kg)		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			
VOC MS (W)							
Chloromethane	<0.009	<0.009	<0.018	<0.09	-	-	-
Vinyl Chloride	<0.0012	<0.0012	<0.0024	<0.012	-	-	-
Bromomethane	<0.002	<0.002	<0.004	<0.02	-	-	-
Chloroethane	<0.0025	<0.0025	<0.005	<0.025	-	-	-
Trichlorofluoromethane	<0.0013	<0.0013	<0.0026	<0.013	-	-	-
1,1-Dichloroethene	<0.0012	<0.0012	<0.0024	<0.012	-	-	-
Carbon Disulphide	<0.0013	<0.0013	<0.0026	<0.013	-	-	-
Dichloromethane	<0.0037	<0.0037	<0.0074	<0.037	-	-	-
Tert-butyl methyl ether	<0.0016	<0.0016	<0.0032	<0.016	-	-	-
Trans-1,2-Dichloroethene	<0.0019	<0.0019	<0.0038	<0.019	-	-	-
1,1-Dichloroethane	<0.0012	<0.0012	<0.0024	<0.012	-	-	-
Cis-1,2-Dichloroethene	<0.0023	<0.0023	<0.0046	<0.023	-	-	-
2,2-Dichloropropane	<0.0038	<0.0038	<0.0076	<0.038	-	-	-
Bromochloromethane	<0.0019	<0.0019	<0.0038	<0.019	-	-	-
Chloroform	<0.0018	<0.0018	<0.0036	<0.018	-	-	-
1,1,1-Trichloroethane	<0.0013	<0.0013	<0.0026	<0.013	-	-	-
1,1-Dichloropropene	<0.0013	<0.0013	<0.0026	<0.013	-	-	-
Carbontetrachloride	<0.0014	<0.0014	<0.0028	<0.014	-	-	-
1,2-Dichloroethane	<0.0033	<0.0033	<0.0066	<0.033	-	-	-
Benzene	<0.0013	<0.0013	<0.0026	<0.013	-	-	-
Trichloroethene	<0.0025	<0.0025	<0.005	<0.025	-	-	-
1,2-Dichloropropane	<0.003	<0.003	<0.006	<0.03	-	-	-

Leach Test Information

Date Prepared	06-Jan-2011
pH (pH Units)	7.74
Conductivity (µS/cm)	205.00
Temperature (°C)	14.00
Volume Leachant (Litres)	0.310
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
13/01/2011 06:34:32

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

CEN 2:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/1

Client Reference		**Site Location**	Armitage Road
Mass Sample taken (kg)	0.215	**Moisture Content Ratio (%)**	22.6
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	81.6
Particle Size <4mm	>95%		

Case				
SDG	101213-103			
Lab Sample Number(s)	2573477			
Sampled Date				
Customer Sample Ref.	WS01			
Depth (m)	0.30			

Solid Waste Analysis

Total Organic Carbon (%)	2.63	-	-	-
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)	8.56	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis

	Conc^{n} in 2:1 eluate (mg/l)		2:1 conc^{n} leached (mg/kg)		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			
VOC MS (W)							
Dibromomethane	<0.0027	<0.0027	<0.0054	<0.027	-	-	-
Bromodichloromethane	<0.0009	<0.0009	<0.0018	<0.009	-	-	-
Cis-1,3-Dichloropropene	<0.0019	<0.0019	<0.0038	<0.019	-	-	-
Toluene	<0.0014	<0.0014	<0.0028	<0.014	-	-	-
Trans-1,3-Dichloropropene	<0.0035	<0.0035	<0.007	<0.035	-	-	-
1,1,2-Trichloroethane	<0.0022	<0.0022	<0.0044	<0.022	-	-	-
1,3-Dichloropropane	<0.0022	<0.0022	<0.0044	<0.022	-	-	-
Tetrachloroethene	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Dibromochloromethane	<0.0017	<0.0017	<0.0034	<0.017	-	-	-
1,2-Dibromoethane	<0.0023	<0.0023	<0.0046	<0.023	-	-	-
Chlorobenzene	<0.0035	<0.0035	<0.007	<0.035	-	-	-
1,1,1,2-Tetrachloroethane	<0.0013	<0.0013	<0.0026	<0.013	-	-	-
Ethylbenzene	<0.0025	<0.0025	<0.005	<0.025	-	-	-
p/m-Xylene	<0.0025	<0.0025	<0.005	<0.025	-	-	-
o-Xylene	<0.0017	<0.0017	<0.0034	<0.017	-	-	-
Styrene	<0.0012	<0.0012	<0.0024	<0.012	-	-	-
Bromoform	<0.003	<0.003	<0.006	<0.03	-	-	-
Isopropylbenzene	<0.0014	<0.0014	<0.0028	<0.014	-	-	-
1,1,2,2-Tetrachloroethane	<0.0052	<0.0052	<0.0104	<0.052	-	-	-
1,2,3-Trichloropropane	<0.0078	<0.0078	<0.0156	<0.078	-	-	-
Bromobenzene	<0.002	<0.002	<0.004	<0.02	-	-	-
Propylbenzene	<0.0026	<0.0026	<0.0052	<0.026	-	-	-

Leach Test Information

Date Prepared	06-Jan-2011
pH (pH Units)	7.74
Conductivity (µS/cm)	205.00
Temperature (°C)	14.00
Volume Leachant (Litres)	0.310
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
13/01/2011 06:34:32

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

CEN 2:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/1

Client Reference		**Site Location**	Armitage Road
Mass Sample taken (kg)	0.215	**Moisture Content Ratio (%)**	22.6
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	81.6
Particle Size <4mm	>95%		

Case				
SDG	101213-103			
Lab Sample Number(s)	2573477			
Sampled Date				
Customer Sample Ref.	WS01			
Depth (m)	0.30			

Solid Waste Analysis

Total Organic Carbon (%)	2.63	-	-	-
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)	8.56	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	Concⁿ in 2:1 eluate (mg/l)		2:1 concⁿ leached (mg/kg)		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			
VOC MS (W)							
2-Chlorotoluene	<0.0019	<0.0019	<0.0038	<0.019	-	-	-
1,3,5-Trimethylbenzene	<0.0018	<0.0018	<0.0036	<0.018	-	-	-
4-Chlorotoluene	<0.0019	<0.0019	<0.0038	<0.019	-	-	-
Tert-Butylbenzene	<0.002	<0.002	<0.004	<0.02	-	-	-
1,2,4-Trimethylbenzene	<0.0017	<0.0017	<0.0034	<0.017	-	-	-
Sec-Butylbenzene	<0.0017	<0.0017	<0.0034	<0.017	-	-	-
4-Isopropyltoluene	<0.0026	<0.0026	<0.0052	<0.026	-	-	-
1,3-Dichlorobenzene	<0.0022	<0.0022	<0.0044	<0.022	-	-	-
1,4-Dichlorobenzene	<0.0027	<0.0027	<0.0054	<0.027	-	-	-
n-Butylbenzene	<0.002	<0.002	<0.004	<0.02	-	-	-
1,2-Dichlorobenzene	<0.0037	<0.0037	<0.0074	<0.037	-	-	-
1,2-Dibromo-3-Chloropropane	<0.0098	<0.0098	<0.0196	<0.098	-	-	-
1,2,4-Trichlorobenzene	<0.0023	<0.0023	<0.0046	<0.023	-	-	-
Hexachlorobutadiene	<0.0025	<0.0025	<0.005	<0.025	-	-	-
Tert-amyl methyl ether	<0.001	<0.001	<0.002	<0.01	-	-	-
Naphthalene	<0.0035	<0.0035	<0.007	<0.035	-	-	-
1,2,3-Trichlorobenzene	<0.0031	<0.0031	<0.0062	<0.031	-	-	-
1,3,5-Trichlorobenzene	<0.01	<0.01	<0.02	<0.1	-	-	-

Leach Test Information

Date Prepared	06-Jan-2011
pH (pH Units)	7.74
Conductivity (µS/cm)	205.00
Temperature (°C)	14.00
Volume Leachant (Litres)	0.310
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
13/01/2011 06:34:32

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

CEN 2:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/1

Client Reference		**Site Location**	Armitage Road
Mass Sample taken (kg)	0.211	**Moisture Content Ratio (%)**	20.6
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	82.9
Particle Size <4mm	>95%		

Case				
SDG	101213-103			
Lab Sample Number(s)	2573481			
Sampled Date				
Customer Sample Ref.	HP02			
Depth (m)	0.10			

Solid Waste Analysis

Total Organic Carbon (%)	2.82	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	7.64	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis

	Concⁿ in 2:1 eluate (mg/l)		2:1 concⁿ leached (mg/kg)		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	0.00546	<0.00012	0.0109	<0.0012	0.5	2	25
Barium	-	-	-	-	20	100	300
Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
Chromium	0.00344	<0.00022	0.00688	<0.0022	0.5	10	70
Copper	0.0112	<0.00085	0.0224	<0.0085	2	50	100
Mercury Dissolved (CVAF)	0.0000435	<0.00001	0.000087	<0.0001	0.01	0.2	2
Molybdenum	-	-	-	-	0.5	10	30
Nickel	0.00399	<0.00015	0.00798	<0.0015	0.4	10	40
Lead	0.00478	<0.00002	0.00956	<0.0002	0.5	10	50
Antimony	-	-	-	-	0.06	0.7	5
Selenium	-	-	-	-	0.1	0.5	7
Zinc	0.00685	<0.00041	0.0137	<0.0041	4	50	200
Chloride	-	-	-	-	800	15000	25000
Fluoride	-	-	-	-	10	150	500
Sulphate (soluble)	-	-	-	-	1000	20000	50000
Total Dissolved Solids	-	-	-	-	4000	60000	100000
Total Monohydric Phenols (W)	-	-	-	-	1	-	-
Dissolved Organic Carbon	-	-	-	-	500	800	1000

Leach Test Information

Date Prepared	06-Jan-2011
pH (pH Units)	8.03
Conductivity (µS/cm)	459.00
Temperature (°C)	12.40
Volume Leachant (Litres)	0.314
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
13/01/2011 06:34:32

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

CEN 2:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/1

Client Reference		**Site Location**	Armitage Road
Mass Sample taken (kg)	0.211	**Moisture Content Ratio (%)**	20.6
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	82.9
Particle Size <4mm	>95%		

Case				
SDG	101213-103			
Lab Sample Number(s)	2573481			
Sampled Date				
Customer Sample Ref.	HP02			
Depth (m)	0.10			

Solid Waste Analysis

Total Organic Carbon (%)	2.82	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	7.64	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis

	Conc^{n} in 2:1 eluate (mg/l)		2:1 conc^{n} leached (mg/kg)		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			
Boron	0.1	<0.0094	0.2	<0.094	-	-	-
Vanadium	0.00538	<0.00024	0.0108	<0.0024	-	-	-
SVOC MS (W) - Aqueous							
1,2,4-Trichlorobenzene	<0.0023	<0.0023	<0.0046	<0.023	-	-	-
1,2-Dichlorobenzene	<0.0037	<0.0037	<0.0074	<0.037	-	-	-
1,3-Dichlorobenzene	<0.0022	<0.0022	<0.0044	<0.022	-	-	-
1,4-Dichlorobenzene	<0.0027	<0.0027	<0.0054	<0.027	-	-	-
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-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-Bromophenylphenylether	<0.001	<0.001	<0.002	<0.01	-	-	-
4-Chloro-3-methylphenol	<0.001	<0.001	<0.002	<0.01	-	-	-
4-Chloroaniline	<0.001	<0.001	<0.002	<0.01	-	-	-

Leach Test Information

Date Prepared	06-Jan-2011
pH (pH Units)	8.03
Conductivity (µS/cm)	459.00
Temperature (°C)	12.40
Volume Leachant (Litres)	0.314
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
13/01/2011 06:34:32

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

CEN 2:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/1

Client Reference		**Site Location**	Armitage Road
Mass Sample taken (kg)	0.211	**Moisture Content Ratio (%)**	20.6
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	82.9
Particle Size <4mm	>95%		

Case				
SDG	101213-103			
Lab Sample Number(s)	2573481			
Sampled Date				
Customer Sample Ref.	HP02			
Depth (m)	0.10			

Solid Waste Analysis

Total Organic Carbon (%)	2.82	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	7.64	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis

	Concⁿ in 2:1 eluate (mg/l)		2:1 concⁿ leached (mg/kg)		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			
SVOC MS (W) - Aqueous							
4-Chlorophenylphenylether	<0.001	<0.001	<0.002	<0.01	-	-	-
4-Methylphenol	<0.001	<0.001	<0.002	<0.01	-	-	-
4-Nitrophenol	<0.001	<0.001	<0.002	<0.01	-	-	-
4-Nitroaniline	<0.001	<0.001	<0.002	<0.01	-	-	-
Azobenzene	<0.001	<0.001	<0.002	<0.01	-	-	-
Acenaphthylene	<0.001	<0.001	<0.002	<0.01	-	-	-
Acenaphthene	<0.001	<0.001	<0.002	<0.01	-	-	-
Anthracene	<0.001	<0.001	<0.002	<0.01	-	-	-
Bis(2-chloroethyl)ether	<0.001	<0.001	<0.002	<0.01	-	-	-
Bis(2-chloroethoxy)methane	<0.001	<0.001	<0.002	<0.01	-	-	-
Bis(2-ethylhexyl) phthalate	<0.002	<0.002	<0.004	<0.02	-	-	-
Benzo(a)anthracene	<0.001	<0.001	<0.002	<0.01	-	-	-
Butylbenzyl phthalate	<0.001	<0.001	<0.002	<0.01	-	-	-
Benzo(b)fluoranthene	<0.001	<0.001	<0.002	<0.01	-	-	-
Benzo(k)fluoranthene	<0.001	<0.001	<0.002	<0.01	-	-	-
Benzo(a)pyrene	<0.001	<0.001	<0.002	<0.01	-	-	-
Benzo(ghi)perylene	<0.001	<0.001	<0.002	<0.01	-	-	-
Carbazole	<0.001	<0.001	<0.002	<0.01	-	-	-
Chrysene	<0.001	<0.001	<0.002	<0.01	-	-	-
Dibenzofuran	<0.001	<0.001	<0.002	<0.01	-	-	-
Di-n-butyl phthalate	<0.001	<0.001	<0.002	<0.01	-	-	-
Diethyl phthalate	<0.001	<0.001	<0.002	<0.01	-	-	-

Leach Test Information

Date Prepared	06-Jan-2011
pH (pH Units)	8.03
Conductivity (µS/cm)	459.00
Temperature (°C)	12.40
Volume Leachant (Litres)	0.314
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
13/01/2011 06:34:32

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

CEN 2:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/1

Client Reference		**Site Location**	Armitage Road
Mass Sample taken (kg)	0.211	**Moisture Content Ratio (%)**	20.6
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	82.9
Particle Size <4mm	>95%		

Case				
SDG	101213-103			
Lab Sample Number(s)	2573481			
Sampled Date				
Customer Sample Ref.	HP02			
Depth (m)	0.10			

Solid Waste Analysis

Total Organic Carbon (%)	2.82	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	7.64	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis

	Conc^{n} in 2:1 eluate (mg/l)		2:1 conc^{n} leached (mg/kg)		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			
SVOC MS (W) - Aqueous							
Dibenzo(a,h)anthracene	<0.001	<0.001	<0.002	<0.01	-	-	-
Dimethyl phthalate	<0.001	<0.001	<0.002	<0.01	-	-	-
Di-n-Octyl phthalate	<0.005	<0.005	<0.01	<0.05	-	-	-
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	-	-	-
Pentachlorophenol	<0.001	<0.001	<0.002	<0.01	-	-	-
Phenol	<0.001	<0.001	<0.002	<0.01	-	-	-
N-nitrosodi-n-propylamine	<0.001	<0.001	<0.002	<0.01	-	-	-
Hexachloroethane	<0.001	<0.001	<0.002	<0.01	-	-	-
Nitrobenzene	<0.001	<0.001	<0.002	<0.01	-	-	-
Naphthalene	<0.0035	<0.0035	<0.007	<0.035	-	-	-
Isophorone	<0.001	<0.001	<0.002	<0.01	-	-	-
Hexachlorocyclopentadiene	<0.001	<0.001	<0.002	<0.01	-	-	-
Phenanthrene	<0.001	<0.001	<0.002	<0.01	-	-	-
Indeno (1,2,3-cd) Pyrene	<0.001	<0.001	<0.002	<0.01	-	-	-
Pyrene	<0.001	<0.001	<0.002	<0.01	-	-	-
VOC MS (W)							
Dibromofluoromethane	-	-	-	-	-	-	-
Toluene-d8	-	-	-	-	-	-	-
4-Bromofluorobenzene	-	-	-	-	-	-	-
Dichlorodifluoromethane	<0.007	<0.007	<0.014	<0.07	-	-	-

Leach Test Information

Date Prepared	06-Jan-2011
pH (pH Units)	8.03
Conductivity (µS/cm)	459.00
Temperature (°C)	12.40
Volume Leachant (Litres)	0.314
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
13/01/2011 06:34:32

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

CEN 2:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/1

Client Reference		**Site Location**	Armitage Road
Mass Sample taken (kg)	0.211	**Moisture Content Ratio (%)**	20.6
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	82.9
Particle Size <4mm	>95%		

Case				
SDG	101213-103			
Lab Sample Number(s)	2573481			
Sampled Date				
Customer Sample Ref.	HP02			
Depth (m)	0.10			

Solid Waste Analysis

Total Organic Carbon (%)	2.82	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	7.64	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis

	Concⁿ in 2:1 eluate (mg/l)		2:1 concⁿ leached (mg/kg)		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			
VOC MS (W)							
Chloromethane	<0.009	<0.009	<0.018	<0.09	-	-	-
Vinyl Chloride	<0.0012	<0.0012	<0.0024	<0.012	-	-	-
Bromomethane	<0.002	<0.002	<0.004	<0.02	-	-	-
Chloroethane	<0.0025	<0.0025	<0.005	<0.025	-	-	-
Trichlorofluoromethane	<0.0013	<0.0013	<0.0026	<0.013	-	-	-
1,1-Dichloroethene	<0.0012	<0.0012	<0.0024	<0.012	-	-	-
Carbon Disulphide	<0.0013	<0.0013	<0.0026	<0.013	-	-	-
Dichloromethane	<0.0037	<0.0037	<0.0074	<0.037	-	-	-
Tert-butyl methyl ether	<0.0016	<0.0016	<0.0032	<0.016	-	-	-
Trans-1,2-Dichloroethene	<0.0019	<0.0019	<0.0038	<0.019	-	-	-
1,1-Dichloroethane	<0.0012	<0.0012	<0.0024	<0.012	-	-	-
Cis-1,2-Dichloroethene	<0.0023	<0.0023	<0.0046	<0.023	-	-	-
2,2-Dichloropropane	<0.0038	<0.0038	<0.0076	<0.038	-	-	-
Bromochloromethane	<0.0019	<0.0019	<0.0038	<0.019	-	-	-
Chloroform	<0.0018	<0.0018	<0.0036	<0.018	-	-	-
1,1,1-Trichloroethane	<0.0013	<0.0013	<0.0026	<0.013	-	-	-
1,1-Dichloropropene	<0.0013	<0.0013	<0.0026	<0.013	-	-	-
Carbontetrachloride	<0.0014	<0.0014	<0.0028	<0.014	-	-	-
1,2-Dichloroethane	<0.0033	<0.0033	<0.0066	<0.033	-	-	-
Benzene	<0.0013	<0.0013	<0.0026	<0.013	-	-	-
Trichloroethene	<0.0025	<0.0025	<0.005	<0.025	-	-	-
1,2-Dichloropropane	<0.003	<0.003	<0.006	<0.03	-	-	-

Leach Test Information

Date Prepared	06-Jan-2011
pH (pH Units)	8.03
Conductivity (µS/cm)	459.00
Temperature (°C)	12.40
Volume Leachant (Litres)	0.314
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
13/01/2011 06:34:32

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

CEN 2:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/1

Client Reference		**Site Location**	Armitage Road
Mass Sample taken (kg)	0.211	**Moisture Content Ratio (%)**	20.6
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	82.9
Particle Size <4mm	>95%		

Case				
SDG	101213-103			
Lab Sample Number(s)	2573481			
Sampled Date				
Customer Sample Ref.	HP02			
Depth (m)	0.10			

Solid Waste Analysis

Total Organic Carbon (%)	2.82	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	7.64	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis

	Conc^{n} in 2:1 eluate (mg/l)		2:1 conc^{n} leached (mg/kg)		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			
VOC MS (W)							
Dibromomethane	<0.0027	<0.0027	<0.0054	<0.027	-	-	-
Bromodichloromethane	<0.0009	<0.0009	<0.0018	<0.009	-	-	-
Cis-1,3-Dichloropropene	<0.0019	<0.0019	<0.0038	<0.019	-	-	-
Toluene	<0.0014	<0.0014	<0.0028	<0.014	-	-	-
Trans-1,3-Dichloropropene	<0.0035	<0.0035	<0.007	<0.035	-	-	-
1,1,2-Trichloroethane	<0.0022	<0.0022	<0.0044	<0.022	-	-	-
1,3-Dichloropropane	<0.0022	<0.0022	<0.0044	<0.022	-	-	-
Tetrachloroethene	<0.0015	<0.0015	<0.003	<0.015	-	-	-
Dibromochloromethane	<0.0017	<0.0017	<0.0034	<0.017	-	-	-
1,2-Dibromoethane	<0.0023	<0.0023	<0.0046	<0.023	-	-	-
Chlorobenzene	<0.0035	<0.0035	<0.007	<0.035	-	-	-
1,1,1,2-Tetrachloroethane	<0.0013	<0.0013	<0.0026	<0.013	-	-	-
Ethylbenzene	<0.0025	<0.0025	<0.005	<0.025	-	-	-
p/m-Xylene	<0.0025	<0.0025	<0.005	<0.025	-	-	-
o-Xylene	<0.0017	<0.0017	<0.0034	<0.017	-	-	-
Styrene	<0.0012	<0.0012	<0.0024	<0.012	-	-	-
Bromoform	<0.003	<0.003	<0.006	<0.03	-	-	-
Isopropylbenzene	<0.0014	<0.0014	<0.0028	<0.014	-	-	-
1,1,2,2-Tetrachloroethane	<0.0052	<0.0052	<0.0104	<0.052	-	-	-
1,2,3-Trichloropropane	<0.0078	<0.0078	<0.0156	<0.078	-	-	-
Bromobenzene	<0.002	<0.002	<0.004	<0.02	-	-	-
Propylbenzene	<0.0026	<0.0026	<0.0052	<0.026	-	-	-

Leach Test Information

Date Prepared	06-Jan-2011
pH (pH Units)	8.03
Conductivity (µS/cm)	459.00
Temperature (°C)	12.40
Volume Leachant (Litres)	0.314
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
13/01/2011 06:34:32

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

CEN 2:1 STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/1

Client Reference		**Site Location**	Armitage Road
Mass Sample taken (kg)	0.211	**Moisture Content Ratio (%)**	20.6
Mass of dry sample (kg)	0.175	**Dry Matter Content Ratio (%)**	82.9
Particle Size <4mm	>95%		

Case				
SDG	101213-103			
Lab Sample Number(s)	2573481			
Sampled Date				
Customer Sample Ref.	HP02			
Depth (m)	0.10			

Solid Waste Analysis

Total Organic Carbon (%)	2.82	-	-	-
Loss on Ignition (%)	-	-	-	-
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	-	-	-	-
Mineral Oil (mg/kg)	-	-	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	7.64	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis

	Conc^{n} in 2:1 eluate (mg/l)		2:1 conc^{n} leached (mg/kg)		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			
VOC MS (W)							
2-Chlorotoluene	<0.0019	<0.0019	<0.0038	<0.019	-	-	-
1,3,5-Trimethylbenzene	<0.0018	<0.0018	<0.0036	<0.018	-	-	-
4-Chlorotoluene	<0.0019	<0.0019	<0.0038	<0.019	-	-	-
Tert-Butylbenzene	<0.002	<0.002	<0.004	<0.02	-	-	-
1,2,4-Trimethylbenzene	<0.0017	<0.0017	<0.0034	<0.017	-	-	-
Sec-Butylbenzene	<0.0017	<0.0017	<0.0034	<0.017	-	-	-
4-Isopropyltoluene	<0.0026	<0.0026	<0.0052	<0.026	-	-	-
1,3-Dichlorobenzene	<0.0022	<0.0022	<0.0044	<0.022	-	-	-
1,4-Dichlorobenzene	<0.0027	<0.0027	<0.0054	<0.027	-	-	-
n-Butylbenzene	<0.002	<0.002	<0.004	<0.02	-	-	-
1,2-Dichlorobenzene	<0.0037	<0.0037	<0.0074	<0.037	-	-	-
1,2-Dibromo-3-Chloropropane	<0.0098	<0.0098	<0.0196	<0.098	-	-	-
1,2,4-Trichlorobenzene	<0.0023	<0.0023	<0.0046	<0.023	-	-	-
Hexachlorobutadiene	<0.0025	<0.0025	<0.005	<0.025	-	-	-
Tert-amyl methyl ether	<0.001	<0.001	<0.002	<0.01	-	-	-
Naphthalene	<0.0035	<0.0035	<0.007	<0.035	-	-	-
1,2,3-Trichlorobenzene	<0.0031	<0.0031	<0.0062	<0.031	-	-	-
1,3,5-Trichlorobenzene	<0.01	<0.01	<0.02	<0.1	-	-	-

Leach Test Information

Date Prepared	06-Jan-2011
pH (pH Units)	8.03
Conductivity (µS/cm)	459.00
Temperature (°C)	12.40
Volume Leachant (Litres)	0.314
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
13/01/2011 06:34:32

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
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		
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		
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		
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		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters		
TM218	Microwave extraction – EPA method 3546	Microwave extraction - EPA method 3546		
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer		
TM243				

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

CERTIFICATE OF ANALYSIS

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
Client Reference:		**Attention:**	Gareth Taylor	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	2573472	2573481	2573485	2573477	2573490	2573494
Customer Sample Ref.	HP01	HP02	HP03	WS01	WS02	WS03
AGS Ref.						
Depth	0.30	0.10	0.30	0.30	0.30	0.10
Type	SOLID	SOLID	SOLID	SOLID	SOLID	SOLID
Anions by Kone (soil)	06-Jan-2011	07-Jan-2011	07-Jan-2011			
Asbestos Containing Material Screen	05-Jan-2011	05-Jan-2011	05-Jan-2011	05-Jan-2011		
Boron Water Soluble	06-Jan-2011	07-Jan-2011	07-Jan-2011	07-Jan-2011	05-Jan-2011	05-Jan-2011
CEN 2:1 Leachate (1 Stage)	06-Jan-2011	06-Jan-2011		06-Jan-2011		
CEN Readings	07-Jan-2011	07-Jan-2011		07-Jan-2011		
Dissolved Metals by ICP-MS	10-Jan-2011	10-Jan-2011		10-Jan-2011		
EPH CWG (Aliphatic) GC (S)			10-Jan-2011	10-Jan-2011		
EPH CWG (Aromatic) GC (S)			10-Jan-2011	10-Jan-2011		
GRO by GC-FID (S)			12-Jan-2011	13-Jan-2011		
Hexavalent Chromium (s)	07-Jan-2011	07-Jan-2011	07-Jan-2011	07-Jan-2011	05-Jan-2011	05-Jan-2011
Mercury Dissolved	07-Jan-2011	07-Jan-2011		07-Jan-2011		
Metals by iCap-OES (Soil)	06-Jan-2011	07-Jan-2011	07-Jan-2011	07-Jan-2011	05-Jan-2011	05-Jan-2011
PAH by GCMS			11-Jan-2011		10-Jan-2011	09-Jan-2011
pH	07-Jan-2011	07-Jan-2011	07-Jan-2011	07-Jan-2011	05-Jan-2011	04-Jan-2011
Sample description	05-Jan-2011	06-Jan-2011	06-Jan-2011	06-Jan-2011	04-Jan-2011	04-Jan-2011
Semi Volatile Organic Compounds	10-Jan-2011	10-Jan-2011		10-Jan-2011		
SVOC MS (W) - Aqueous	12-Jan-2011	11-Jan-2011		11-Jan-2011		
Total Organic Carbon	06-Jan-2011	07-Jan-2011	07-Jan-2011	07-Jan-2011	05-Jan-2011	05-Jan-2011
TPH CWG GC (S)			12-Jan-2011	13-Jan-2011		
VOC MS (S)	11-Jan-2011	11-Jan-2011		11-Jan-2011		
VOC MS (W)	10-Jan-2011	10-Jan-2011		10-Jan-2011		

SDG:	101213-103	**Location:**	Armitage Road	**Order Number:**	
Job:	H_GRONTMIJ_BRI-4	**Customer:**	Grontmij	**Report Number:**	110767
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. 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.

20. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

21. 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.

22. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

23. 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.

24. 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	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

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).

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 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.

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

Note: this lab certificate covers multiple sites which were monitored on the same day. Only the three samples from "Armitage Road" pertain to this report.

CERTIFICATE OF ANALYSIS

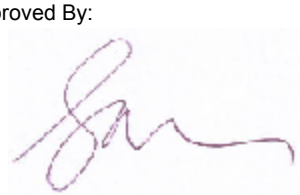
Date:	10 June 2011
Customer:	H_GRONTMIJ_SOL
Sample Delivery Group (SDG):	110602-58
Your Reference:	
Location:	Part 2a Assistance
Report No:	133432

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	Vial
3588799	FIVEWAYS 5			1l green glass bottle
3588815	8 STAGBOROUGH			1l green glass bottle
3588800	FIVEWAYS 9			1l green glass bottle
3588797	VIEW ST. 9 WARD			1l green glass bottle
3588808	10 WESTGATE			1l green glass bottle
3588809	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	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	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

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	

Component	LOD/Units	Method	
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.

APPENDIX E

Site: *Armitage Rd* **Job No.** 106270

Monitoring Well Sampling & Testing Record

BH	Date	Pipe Internal Diameter mm	Monitored By	Gas													Weather			
				Borehole Pressure pa	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	Atmospheric Pressure mbar	Conditions @ Monitoring	Ambient Temp °C	Notes
WS01	28/01/2011		RJH	0.00	-0.1	0	0	0.8	-0.0008	19.4	-3	-10	1	0	0	GFM	1023	Clear	-5	
WS01	11/02/2011		KS	NM	0.2	0	0	0.9	0.0018	19.1	-3	-10				GFM	1007	Overcast	6.0	
WS01	25/02/2011		KAS	4.00	0.7	0.1	0.0007	0.9	0.0063	19.2	-1	-10	1	0	0	GFM	1019	Overcast	11	
WS01	11/03/2011		KAS	0.00	0.1	0.1	0.0001	0.8	0.0008	19.1	-1	-10	1	0	0	GFM	1011	Sunny	11.0	
WS02	28/01/2011		RJH	-2.00	-0.4	0	0	0.9	-0.0036	19.2	-3	-10	1	0	0	GFM	1022	Clear	-5.0	
WS02	11/02/2011		KS	NM	0	0	0	0.9	0	19.1	-3	-10				GFM	1007	Overcast	6	
WS02	25/02/2011		KAS	0.00	0.1	0.1	0.0001	1.4	0.0014	19.2	-1	-10	1	0.003	0	GFM	1018	Overcast	11.0	
WS02	11/03/2011		KAS	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	Sunny	11	no access
WS03	28/01/2011		RJH	-2.00	-0.4	0	0	1.1	-0.0044	18.8	-1	-10	1	0	0	GFM	1022	Clear	-5	
WS03	11/02/2011		KS	NM	0.2	0	0	1.1	0.0022	19.1	-1	-10				GFM	1007	Overcast	6	
WS03	25/02/2011		KAS		0.1	0.1	0.0001	1	0.001	18.7	-1	-10	1	0.007	0	GFM	1018	Overcast	11.0	
WS03	11/03/2011		KAS	-1.00	-0.2	0.1	-0.0002	1.3	-0.0026	18.8	-3	-10	1	0	0	GFM	1011	Sunny	11.0	

NOTES: NM = Not Measured

GSV (l/hr) = [gas well gas concentration (%v/v)] **x** [gas well flow rate (l/hr)] / 100

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