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Regulation 5(2)(a)
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West Midlands Interchange

Four Ashes Ltd

Intended for
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WEST MIDLANDS INTERCHANGE – SOUTH-EAST AREA

PHASE II ENVIRONMENTAL SITE ASSESSMENT – FACTUAL REPORT

RAMBOLL

WEST MIDLANDS INTERCHANGE – SOUTH-EAST AREA
PHASE II ENVIRONMENTAL SITE ASSESSMENT – FACTUAL REPORT

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APPENDICES

EXECUTIVE SUMMARY

Ramboll Environment and Health UK Limited ("Ramboll") was commissioned by Four Ashes Limited (the "Client"), to undertake a Phase II Environmental Site Assessment (ESA) of the West Midlands Interchange – South-east Area (the "Site", as illustrated by Figure 1, Appendix 1). The assessment was conducted in support of the Client as part of the intention to redevelop the Site for industrial / commercial usage; to inform the master planning of the proposed development; and to provide assessment data to support a Development Consent Order (DCO) application for the Site. The DCO application area is larger than that assessed as the Site in this report. Previous assessment of the wider DCO application area was undertaken and reported separately in the Ramboll report ref: UK15-22306_Ph2, Issue: 3, dated 18th March 2016.

This Phase II Environmental Site Assessment (ESA) follows a walkover of the Site which identified a number of potentially contaminative historical land uses in specific locations across the Site.

At the time of writing a finalised development layout was not available and hence assessment has been undertaken in consideration of a generic industrial / commercial development associated with a rail terminal.

The intrusive environmental works comprised the advancement of 10 no. deeper excavations with groundwater monitoring wells installed, 9 no. shallow excavations with dedicated gas monitoring wells installed; and 15 no. shallow excavations for soil sampling only. The sampling of soils and groundwater present was undertaken by Ramboll, and analysis was completed by an accredited independent laboratory.

Field Observations

The geology generally comprised glacial till with variable mudstone, sandstone and quartzite gravel underlain by weathered upper layers of the Bromsgrove Sandstone.

Screening of Analytical Results - Soils

The soil and groundwater analytical results were screened against assessment criteria for current Site users (human health) and future Site users in the context of the proposed commercial / industrial use, as well as with respect to the controlled waters environment.

None of the soil samples analysed were found to contain an exceedance of the Commercial / Industrial guideline values for inorganic compounds.

Asbestos was encountered in seven (7) soil samples taken from the Site (all in the landfilled areas in the southern portion of the Site). Further consideration of these locations will be required once specific building layouts are finalised; preferably minimising earthworks required at this location (or adopting suitable mitigation measures during construction if applicable).

Screening of Analytical Results - Groundwater

Groundwater results were compared to criteria derived to safeguard human health (e.g. from a potential volatilisation pathway), and the water environment. The reported results are below the available human health criteria. The water environment has been assessed with comparison of groundwater results primarily against UK Drinking Water Standards (DWS) (which are considered very stringent initial screening criteria). Where no published DWS are available Environmental Quality Standards (EQS). or an alternative appropriate international standard has been applied for assessment purposes. The Controlled Waters assessment indicated:

- pH values were slightly acidic at two of the twelve locations assessed with reported values of 4.42 and 5.48;

- A number of isolated heavy metal exceedances was observed including beryllium, cadmium, copper, nickel, selenium, and zinc. Where detected, the concentrations are generally less than one order of magnitude above the adopted criteria;
- Marginal sulphate, nitrate and nitrite exceedances were reported at isolated locations;
- Select polycyclic aromatic hydrocarbon (PAH) compounds including fluoranthene, benzo(a)pyrene and benzo(a)anthracene were also detected at select locations at concentrations slightly above the respective screening criterion; and
- Volatile Organic Compound (VOC) results were below the adopted screening criteria with the exception of two chloroform detections.

Conclusions

The purpose of the intrusive investigation was to assess the potential for contamination of soil and groundwater to have occurred at the Site associated with its current, recent and historic uses. No significant widespread contamination of shallow soils or groundwater has been identified, therefore the identified contaminative profile is unlikely to preclude the proposed redevelopment of the Site.

However a number of notable, localised impacts were observed across the Site which will require attention prior to redevelopment:

- Area of landfill: part of this area of the Site is potentially proposed for redevelopment into warehouse buildings with both hardstanding and/or building cover anticipated and areas of undeveloped land. Landfill material, including asbestos containing materials, is present up to 4.1m below ground level (bgl) in these areas. This area should be further considered in light of specific building layouts once produced; and
- Ground Gas: A general Site wide Gas Characteristic Situation 2 ‘Low Risk’ has been calculated based upon four rounds of gas monitoring. Based upon these preliminary findings it is likely that basic gas protection measures may be required within new buildings at the Site; however, further assessment and/or monitoring is likely to be required once the specific building layouts are finalised.

1. INTRODUCTION

1.1 Background

Ramboll Environment & Health UK Limited ("Ramboll") was commissioned by Four Ashes Limited (the "Client"), to undertake a Phase II Environmental Site Assessment (ESA) of the West Midlands Interchange – South-east Area (within this report the "Site" is as illustrated by Figure 1, Appendix 1). The assessment was conducted in support of the Client as part of the intention to redevelop the Site for industrial / commercial usage; to inform the master planning of the proposed development; and to provide assessment data to support a Development Consent Order (DCO) application for the Site. The DCO application area is larger than that assessed as the Site in this report. Previous assessment of the wider DCO application area was undertaken and reported separately in the Ramboll report ref: UK15-22306_Ph2, Issue: 3, dated 18th March 2016.

This Phase II Environmental Site Assessment (ESA) follows a walkover of the Site which identified a number of potentially contaminative historical land uses in specific locations across the Site.

This ESA intrusive works were conducted by Waldeck Associated Ltd (the project consulting engineers) who instructed a third party site investigation contractor, RSA Geotechnics Ltd (RSA), to undertake and manage the Site investigation works, including the interpretive geotechnical Site assessment. Ramboll, prior to the works, liaised with Waldeck Associates Ltd (Waldeck) and input into a specification of works, as such Ramboll acted as the environmental specialist and undertook all environmental sampling, monitoring and assessment.

At the time of writing finalised, specific building layouts were not available and hence assessment has been undertaken in consideration of a generic industrial / commercial development with some areas of associated green infrastructure.

In advance of the intrusive works the proposed scope was issued to the Environment Agency (EA) and South Staffordshire District Council (SSDC) for comment. The proposed scope was agreed with the EA. SSDC did not provide a response, however the scope was based on previous assessment of adjacent land which was previously agreed with SSDC.

1.2 Objectives

The main objective of the works conducted by Ramboll was to assess the potential presence and likely significance of ground contamination at the Site which need to be addressed in the development of the Site for commercial / industrial end-use.

The specific objectives were as follows:

- to characterise soils beneath the Site and the extent to which contamination, if present, may have leached into the underlying deposits; and
- to characterise shallow groundwater beneath the Site, including the depth to groundwater, the direction of groundwater flow and presence and potential significance on contaminant impacts.

This report comprises factual findings is not intended to comprise detailed interpretation with respect to the proposed development. Detailed interpretation (including a Conceptual Site Model) is covered in separate documentation (the Environmental Statement for the proposed development).

1.3 Limitations

In the preparation of this report Ramboll has made reference to the UK regulatory guidance and methodologies, including, but not limited to: CLR11 Model Procedures for the Management of

Land Contamination; BS5930:1999 Code of Practice for Site Investigation; BS10175:2011 Code of Practice for the Investigation of Potentially Contaminated Sites, and the EA Guiding Principles for Land Contamination (GPLC). This report does not constitute a geotechnical assessment of the Site and should not be relied upon for geotechnical appraisal of the proposed development (a geotechnical assessment is being undertaken by other parties).

This review cannot rule out the existence of latent conditions including contamination not identified and defined by the data and information available for Ramboll's review; however, this report is intended, consistent with normal standards of practice and care, to assist the Client in identifying the risks of such latent conditions.

The conclusions presented in this report represent Ramboll's best professional judgment based upon the information available and conditions existing as of the date of this report. In performing its assignment, Ramboll must rely upon publicly available information, information provided by the Client and information provided by third-parties. Accordingly, the conclusions in this report are valid only to the extent that the information provided to Ramboll was accurate and complete.

This review is not intended as legal advice, nor is it an exhaustive review of Site conditions or facility compliance. Ramboll makes no representations or warranties, expressed or implied, about the conditions of the Site.

1.4 Report Layout

The report is structured in the following way:-

Section 1: describes the background to the report and sets out the objectives of the investigation;

Section 2: describes the current Site layout and summarises pertinent desktop information;

Section 3: introduces a preliminary conceptual site model for the Site and describes the investigation strategy, sets out the sampling and analysis rationale/techniques;

Section 4: describes the findings of the investigation, including the ground and groundwater conditions and summarises field evidence of contamination;

Section 5: summarises the laboratory chemical analysis results for soils and groundwaters and screens the data against risk based Generic Assessment Criteria (GAC) for human health and controlled waters devised by Ramboll; and

Section 6: screens ground gas data against generic screening criteria, summarises the results of ground gas monitoring and discusses potential risks to the built environment.

2. SITE DESCRIPTION

2.1 Site Setting

The Site is located approximately 10 km to the north of Wolverhampton City Centre, at National Grid Reference 392710, 308849 (see Figure 1, Appendix 1 for Site location). The Site forms an irregular shape and occupies an area of approximately 42.6 hectares. The northern Site boundary is formed by Vicarage Road, the eastern Site boundary formed by Stable Lane and the southern Site boundary formed by the Worcestershire and Staffordshire Canal.

The land surrounding the Site primarily comprises open (greenfield) land used for agricultural purposes, with Straight Mile Road bisecting the Site from west to east. Four Ashes Industrial Estate is located to the south-west of the Site and SI Group (chemical) works is located to the north-west.

2.2 Site Description

The topography of the Site is gently undulating with a gentle slope to the south-west. The corners of the Site are at the following elevations:

- NE: 110 m above Ordnance Datum (AOD);
- E: 109m AOD; and
- SW: 106 m AOD.

The Site is separated into northern and southern parts by Straight Mile Road. The northern part of the Site is largely used as grazing fields for sheep, cows and horses. Three fields, to the south of Vicarage Road are used for cropping and farm buildings are located in the most northerly point of the Site. The fields are undeveloped and are defined by hedgerows and fencing. The southern part of the Site is used for horse paddocks.

2.3 Site Operations

The Site is largely utilised for agricultural purposes. The Site has a small number of access roads, mainly to access the farm buildings and horse paddocks.

Calf Heath Farm and associated buildings, occupy the northern corner of the Site. The remainder of the Site is undeveloped, with the exception of temporary facilities and shelters present in the horse paddocks, to the south of Straight Mile Road.

Environment Agency maps show three areas of historic landfill on-site between to the south of Vicarage Road relating to the former ‘Four Ashes Quarry’, and between Vicarage Road and Straight Mile, named ‘Four Ashes Pit’. The former reportedly received inert wastes and the latter inert and industrial wastes.

3. PRELIMINARY RISK ASSESSMENT

The following information was collated prior to the Phase II ESA to identify potential areas of concern to target during the intrusive works. The preliminary Conceptual Site Model (CSM) is a simplified representation of the environmental conditions at, and in the vicinity of the Site, and is used to initially identify potential sources, potentially sensitive receptors and potential contaminant linkages.

3.1 Potential Sources of Contamination

Potential for Contamination based on current on-site activities prior to investigation:

- The majority of the Site (approximately >95% of the total Site area) comprises open land of agricultural appearance with a ***low*** potential for significant soil or groundwater contamination. No access was provided to the Calf Heath Farm buildings in the northern corner of the Site, however there is potential for the minor storage and use of oils and fuels. Overall, the potential for significant soil and groundwater contamination in this area of the Site is considered to be ***low-moderate***.

Potential for Contamination based on historic on-site activities prior to investigation:

- From at least 1883 the Site was largely undeveloped agricultural land with a ***low*** potential for significant soil or groundwater contamination; and
- Four Ashes Quarry, present between Vicarage Road and Straight Mile, was authorised to receive inert waste; the first input date was given as 5th July 1982 and the last input date 31st December 1985. There is evidence of leachate control for the landfill however no further details were given (based on information from the Environment Agency web-site). Four Ashes Pit Landfill, present to the south of Straight Mile, was authorised to receive industrial an inert waste; the landfill was licensed to receive waste from 26th October 1978 with the licensed surrender dated as 23rd March 1993. Based on current desk study information available, the potential for significant soil or groundwater contamination to exist within the location of the former on-site landfill due to historic uses is considered to be ***moderate***.

Potential for Contamination based on current off-site activities:

- The majority of the Site is surrounded by undeveloped land, additionally with several residential properties and a few light industrial / commercial units located within 250m of the Site boundary;
- Four Ashes Industrial Estate and the SI Group chemical works are located to the south-west and north-west of the Site respectively and these comprise numerous large units of industrial / commercial appearance with the potential for re-fuelling activities and hazardous waste storage. In general there is a ***low*** potential for significant soil and groundwater contamination as a result of current off-site activities. The exception being the off-site SI Group works where there is ***low-moderate*** potential for significant soil or groundwater contamination as a result of current off-site activities. This potential risk is present for any neighbouring land with a similar usage, however it is noted that the SI Group facility is under regulatory control (Environmental Permit), with strict compliance requirements for the storage and management of hazardous materials; and
- An active quarry is present off-site, to the north of Vicarage Road. The potential for significant soil or groundwater contamination to exist at the Site as a result of the off-site quarry is considered to be ***low-moderate***.

Potential for Contamination based on historic off-site activities:

- Historically the majority of the Site has been surrounded by undeveloped land with a ***low*** potential for significant soil or groundwater contamination. Historical potentially contaminative activities in the vicinity that have been present within a 250 m radius of the Site include a chemical works present since the mid-1920s, and by a carbon works and a tar and chemical works since the mid-1950s. It is known there is significantly impacted groundwater off-site to the south-west of the Site, which comprises phenol contamination as a result of off-site historic activities. A remediation strategy has been developed and approved by regulatory bodies, which is expected to be last between 12 and 20 years to remove a significant proportion of contaminated groundwater via a pump and treat method. However, from previous assessment it is known that general groundwater flow direction from the chemical works is to the west and hence any contamination associated with these off-site historic uses will be migrating away from the Site. The potential for significant soil or groundwater contamination to exist at the Site as a result of these off-site activities is considered to be ***low-moderate***.

3.2 Site Environmental Setting / Potential Pathways

- The Site is located on unproductive deposits (superficial deposits) which is further underlain by a Principal Aquifer (sandstone formation) and there are five sensitive groundwater abstractions within 2 km. The Site is situated within an Environment Agency designated Groundwater Source Protection Zone (SPZ) 3 Total Catchment. Overall, the hydrogeological sensitivity in the vicinity of the Site is considered to be ***high***, furthermore the vulnerability of the groundwater resources is considered to be ***high*** due to the lack of extensive building/hardstanding coverage of the Site, and the presence of abstractions including a potable water supply 1.6km south-west.
- The Staffordshire and Worcestershire Canal borders the southern boundary of the Site and the Calf Heath Reservoir is located 300m north. There are two (2) licensed surface water abstractions licensed to the SI-Group, located 600m north-west of the Site which are not considered to be for a sensitive use. There are reportedly no sensitive surface water abstractions within a 2km radius of the Site. Overall, the hydrological sensitivity and vulnerability of the Site are considered to be ***moderate-high***.
- The Site is situated outside a currently designated floodplain. In general terms this means the risk of the Site flooding from rivers or seas is less than 0.1% (1 in 1000).
- Four Ashes SSSI is located 870 m west of the Site, there are no other designated sensitive sites within a 1 km radius of the Site.

3.3 Potential Receptors present

Table 3-1: Potential Receptors present at the Site

Potential Receptors to Contamination (if Present)			**Receptor Present?**
Humans	On-site	The Site is currently in use as agricultural land; there is very limited coverage with hardstanding.	Yes
	On-site	Future Site users – the Site is proposed to be redeveloped for industrial/commercial use.	Yes
	On-site	Controlled Waters for both groundwater and surface water: Groundwater is expected to be present in the superficial deposits and Wildmoor/Bromsgrove	Yes

Potential Receptors to Contamination (if Present)			Receptor Present?
Water Environment		Sandstone Formation, both classified as receptors, the latter as a Principal Aquifer. The Site is predominantly situated on a groundwater SPZ III. A number of small ponds are present on-site, located: • Adjacent to Calf Heath Farm in the north; • To the south of Vicarage Road, between the sheep field and crop field; and • To the south of the crop fields	
	Off-site	Surface water features within the surrounding land include: • Staffordshire and Worcestershire Canal immediately south of the Site; and • Calf Heath Reservoir 300m north	Yes
Ecological Receptors	On-site	There are no designated ecological sites present on-site; however, the Site is formed from a number of fields with hedgerows across the Site, woodlands and a number of surface water features.	No.
	Off-site	Four Ashes SSSI is located 870m west of the Site (however this site is designated for geological and not ecological interest)	Yes
Built Environment	On-site	Calf Heath Farm associated buildings are present in the north of the Site. Underground infrastructure is likely to be present in the form of land drains, electricity and gas supply as well as water and sewerage assets. The Site is proposed to be redeveloped for industrial/commercial use.	Yes

The potential presence of contamination is not expected to preclude the future commercial / industrial redevelopment of the Site. However, further action (such as an intrusive investigation) was recommended (which comprises assessment works described in later sections of this report).

3.4 Preliminary Conceptual Model

In the UK, a risk-based approach is used to assess the potential impact associated with soil or groundwater contamination, as summarised in the Preliminary Conceptual Site Model (refer to Table 3.2). The groundwater underlying land to the north of the Site is reported to migrate to the west, this suggests that any groundwater contamination caused from current or historical activities in Four Ashes Industrial Estate are unlikely to affect the Site. The Site has remained largely undeveloped throughout the Site history until the late 1970's when the area now occupied by horse paddocks and sheep fields was quarried prior to being utilised as a landfill. The northern areas of the Site have remained undeveloped and therefore since there are no significant sources of groundwater contamination, it was considered less likely that significant contamination is present in the groundwater underlying this portion of the Site.

Remedial works are ongoing off-site in the land to the west of the SI Group chemical works associated with the known phenol groundwater contamination; it is considered that these remedial works can continue during and following redevelopment of the Site.

The preliminary conceptual site model is a simplified representation of the environmental conditions at, and in the vicinity of the Site, and is used to initially identify potential sources, potentially sensitive receptors and potential contaminant linkages.

Table 3.2: Preliminary Conceptual Site Model

Table 3.2: Preliminary Conceptual Site Model			
Source	**Pathway[1]**	**Receptor[2]**	**Risk of Contaminant Linkage[3]**
Current use of Site as undeveloped agricultural land (>95% approximately).	Leaching to Groundwater & Groundwater Flow.	Groundwater in the superficial deposits and Wildmoor / Bromsgrove Sandstone Formation.	*Low (agriculture).* No significant on-site potential contamination sources from current use. There is potential for low-level herbicide / pesticide applications. However, following liaison with Site contacts there are no known areas of agricultural waste burial or activities of potential concern such as sheep 'dipping'. There is a potable groundwater supply 1.6 km south-west of the Site.
	Surface water run-off.	Surface water as controlled water.	*Low.* No significant on-site potential contamination sources from agricultural use. Potential receptors include the Staffordshire and Worcestershire Canal which is located immediately off-site to the south and small ponds located across the Site. There are no sensitive surface water abstractions within 2 km of the Site.
	Dermal contact / ingestion.	Site buildings, users and neighbours.	*Low to Moderate.* No significant on-site potential contamination sources from current use. Buildings present on-site comprise farm buildings and temporary shelters, and there are limited users of the Site.

[1]Pathway: mechanism or route by which a contaminant comes into contact with, or otherwise effects, a receptor.

[2]Receptor: persons, living organisms, ecological systems and controlled waters that could be adversely affected by the contaminants.

[3]Risk: probability of the occurrence of, and magnitude or the consequences of, an unwanted adverse effect on a receptor.

Potential sources of contamination relating to historic use on-site include; historical landfills are recorded to be present on Site between Vicarage Road and Straight Mile, and to the south of Straight Mile.	Leaching to Groundwater & Groundwater Flow.	Groundwater in the superficial deposits and Wildmoor / Bromsgrove Sandstone Formation.	*Low to Moderate.* Potential contamination from historical activities cannot be ruled out. Limited low permeability superficial deposits are present to protect the sandstone aquifer.
		Surface water as controlled water via connectivity with groundwater flow.	*Low.* Potential contamination from historical activities cannot be ruled out. The nearest receptor are the on-site ponds and the Staffordshire and Worcestershire Canal located immediately south of the Site. The Canal is considered likely to be a sealed unit and thus not in continuity with shallow groundwater flow.
	Dermal contact / ingestion.	Site buildings, users and neighbours.	*Low to Moderate.* Potential contamination from historical activities cannot be ruled out and there is potential for isolated pockets of contaminants to be located within soils or groundwater on-site. Potential Site users include farm workers and people visiting horses. There is also potential for the public to access the Site as the area is not secured. The proposed development will likely comprise a hardstanding cover across a portion of the Site, effectively breaking the potential direct contact pathway with future users of the Site. Although, a potential short-term risk would be posed to future construction workers during the redevelopment process such as during installation of foundations and utility services. There will also be a significant area of the Site that will remain undeveloped (green infrastructure).
	Vapours/ground gases		*Low to Moderate (vapour).* Potential for vapours from historic use of the Site. There is no hardstanding and only a small number of permanent buildings currently on-site therefore there is limited opportunity for any vapours to accumulate to a hazardous level. There is a moderate potential for a pollutant linkage to exist with regards to vapour ingress into any future development for above ground buildings, particularly in the landfilled areas.

			Low to Moderate (ground gas): There is the potential for ground gas from organic agricultural deposits likely present across the Site and from the historic landfill area, which may affect future development.
Potential current and historical off-site contamination sources in the vicinity of the Site include: Multiple chemical works located within Four Ashes Industrial Estate, 80m south-west from c.1924 including: Carbon works c.1974; Engineering works, depots and warehouses c.1954; and a petrol filling station c.1975. Historical landfill sites immediately north of the Site.	Leaching onto Site in Groundwater & Groundwater Flow.	Groundwater in the superficial deposits and Wildmoor / Bromsgrove Sandstone Formation.	*Low to Moderate*. The presence of potential contamination sources from off-site activities cannot be ruled out. Third party reports indicate that there is off-site contamination of phenols in the groundwater, located to the west of the Site. The associated plumes are reported to migrate to the west, and are therefore unlikely to have a significant impact on the Site.
	Vapours and Ground Gases.	Site buildings, users and neighbours.	*Low to Moderate*. Potential for ground gases and vapours from historic use of surroundings cannot be ruled out. However, historic landfills off-site to the north assessed part of previous assessment (ref: UK15-22306_Ph2, Issue: 3, dated 18th March 2016) did not indicate significantly elevated concentrations of ground gas).

3.5 Site Investigation Strategy

The intrusive investigation works were carried out by Waldeck using sub-contractors RSA who in turn employed further sub-contractors for specific works within the geotechnical assessment.

Ramboll carried out the Environmental Site Assessment (ESA) in tandem with the geotechnical investigation. The works were supervised by Emily Betts of Ramboll with the intrusive works undertaken between 11th September and 26th October 2017.

The environmental works comprised 34 exploratory locations for environmental assessment purposes, some of which comprised deeper boreholes and some shallower window sample or trial pits.

The following exploratory locations were advanced for environmental assessment:

- 10 no. deeper excavations with groundwater monitoring wells installed;
- 9 no. shallow excavations with dedicated gas monitoring wells installed; and
- 15 no. shallow excavations for soil sampling purposes only with no environmental monitoring wells installed. These exploratory locations were backfilled with clean arisings (trial pits) and capped with bentonite clay (shallow borehole).

Deeper excavations as groundwater monitoring wells

The deep exploratory locations were advanced using either cable percussion or rotary drilling techniques to a maximum depth of either 10 metres below ground level (m bgl) or 20m bgl respectively.

In total 10 no. groundwater monitoring wells were installed across the Site (BH114, BH115, BH116, BH117, BH118A, BH226, BH229, BH230, BH231 and BH233). Groundwater monitoring wells were installed to ensure a minimum of 3 m groundwater column following groundwater level stabilisation.

Shallow excavations as gas monitoring wells

These exploratory locations were advanced using either window sampling techniques or using cable percussion techniques to a maximum depth of 4m bgl.

In total 9 no. gas monitoring wells were installed at varying locations across the Site (WS325, WS326, WS327, WS328, WS330, WS331, WS332, WS333 and BH234). In general the installation of the gas monitoring wells consisted of a maximum depth of 4m bgl with a minimum of 1m non-screened section at the top to ensure a sufficient 'seal' of the monitoring well.

3.5.1 Investigation Works

The following scope of works was undertaken as part of the Environmental Site Assessment:

- Soils were logged and sampled at regular intervals throughout the soil profile which included on-site screening of soil samples for volatile organic compounds (VOCs) using a hand-held photo-ionisation detector (PID).
- Soils were submitted to an accredited independent laboratory (Exova Jones Environmental) for analysis of a range of contaminants determined based on the Site's current and historic uses including potentially harmful elements, polycyclic aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPHs), Volatile and Semi-Volatile Organic Compounds (VOCs and SVOCs) asbestos (identification and quantification where present), pH, pesticide, herbicides and sulphate.

- Six (6) rounds of groundwater level monitoring were undertaken on all installed monitoring wells between October 2017 and December 2017.
- Groundwater sampling was conducted on two (2) occasions at all groundwater monitoring wells and two (2) gas monitoring wells.
- Groundwater samples were submitted to an accredited independent laboratory (Exova Jones Environmental) for analysis of a range of contaminants based on the Site's current and historic uses similar to the soils and included potentially harmful elements such as metals, polycyclic aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPHs), VOCs and sVOCs, pH, pesticide, herbicides and sulphate and hardness.

Exploratory holes were located to ensure sufficient coverage of the Site and where possible close to potential sources of contamination and in areas close to receptors that may be considered down-gradient of any potential contamination or adjacent to potential receptors. Details of the strata encountered and monitoring installation construction are presented on the exploratory hole logs included as Appendix 2. A plan showing the location of the boreholes including those installed with monitoring wells is presented in Appendix 1 as Figure 3.

3.6 Ground Gas Monitoring

Four rounds of ground gas monitoring have been undertaken using a GA5000 portable gas monitor and PID to detected VOCs. However due to issues with access, some monitoring wells were re-visited at a later date. The ground gas monitoring visits were undertaken across: 18-19 October 2017; 26 October 2017; 31 October 2017; 1 December 2017; 21 December 2017 and 23 January 2018.

3.7 Sample Location Rationale

The rationale for positioning the sampling locations is described below. Overall, sample locations were devised to obtain information on ground conditions across the Site and to target the identified potential sources of contamination, as identified during the Site walkover.

In general, there were no significant, isolated, sources of contamination identified during the preliminary CSM and Site walkover. However, the sheep field to the north of Straight Mile and the horse paddocks to the south, have been identified as historical landfill. Therefore, the locations of the exploratory locations were selected to ensure that the Site area was covered sufficiently as an assessment of the Site and identified potential contamination sources, with a higher number of locations positioned in the landfilled areas.

3.8 Sample Acquisition and Analysis

3.8.1 Soils

Soil sampling was undertaken during the works. Soil arising's from exploratory locations were examined visually and logged broadly in accordance with BS 5930:1999 and the European/British Standards BS EN ISO 14688 (for soils). Ramboll has been provided with a copy of the borehole logs, issued by RSA, a copy of which is presented within Appendix 2.

Selected samples were placed into containers appropriate to the type of analysis being undertaken and stored in cool boxes. An independent UKAS and MCERTS accredited laboratory, Exova Jones Environmental, was contracted for all analysis. Chain of custody documentation was maintained to track samples and to fulfil QA/QC requirements.

Soil samples were selected for submission for laboratory analysis based on their visual appearance, observations of potential contamination and potential contaminants associated with former uses. A minimum of one sample per location was obtained.

Selected soil samples were tested on-site for the presence of volatile organic compounds (VOCs) using a photo-ionisation detector (PID), calibrated in accordance with Ramboll's Quality Management procedures. The PID screens for a wide range of VOCs but does not indicate a specific compound; therefore, the results of the PID screening provide a semi-quantitative indication of the concentration of VOCs present in soil pore spaces.

3.8.2 Groundwater

Groundwater was sampled across two distinct events: 18th and 19th October 2017 and also across 1st and 2nd November 2017. The monitoring wells were developed prior to sampling which entailed the pumping of groundwater from each well for at least six (6) times the volume of the groundwater within the well, or removal of such groundwater volume to 'dry out' the well a minimum of three times.

Prior to sampling, the depth to the resting groundwater level as well as the base of the monitoring wells was measured. The wells were purged prior to sampling to ensure that a volume of at least 3 well volumes was removed; however a small number of the wells were identified to have a reasonably slow recharge rate at which point an appropriate 'grab' sample was obtained. Standard physiochemical parameters were monitored on-site using a SmarTroll Water Quality Meter, results are detailed within Appendix 5C.

The recovered samples were placed in containers supplied by the laboratory and stored in cool boxes. All samples were dispatched accompanied by chain of custody documentation to the analytical laboratory.

3.9 Analytical Strategy

The analytical strategy for the Site investigation was developed with reference to information regarding the areas of concern identified during the preliminary CSM the activities which are known to have taken place on-site, and observations during the Site investigation.

The chemical analytical strategy employed for the assessment is summarised in Table 3.3. Groundwater sampling was conducted twice and numbers given within the table refer to samples obtained per sampling event.

Table 3.3: Analytical Strategy

Analytical Suite	Rationale	No. of soil samples submitted	No. of groundwater samples submitted
Metals (arsenic, boron, beryllium, cadmium, total chromium, hexavalent chromium, copper, mercury, nickel, lead, selenium, vanadium, and zinc)	Typically associated with Made Ground	51	12
pH	Increased or decreased pH can be associated with Made Ground	51	12
Total Cyanide	Typically associated with Made Ground and landfills.	51	12

Analytical Suite	**Rationale**	**No. of soil samples submitted**	**No. of groundwater samples submitted**
Total Petroleum Hydrocarbons Criteria Working Group (TPH CWG inc. BTEX compounds)	Typically associated with fuels and oils.	51	12
Polycyclic aromatic hydrocarbons (PAHs) – USEPA16	Typically associated with fuels and oils.	51	12
Total Phenols	Typically associated with Made Ground and also chemicals used within the SI Group land.	51	12
Asbestos Screen and Identification	Typically associated with older buildings and may be found in Made Ground.	32	N/A
Sulphate	May be associated with Made Ground.	51	12
Natural Moisture Content	Used in assessment of asbestos fibre release/dust generation potential.	51	N/A
Fraction Organic Content (FOC)	Used to identify organic rich material to understand the potential leaching of contaminants (if present) and to identify potential areas of concern regarding ground gases.	11	N/A
Volatile Organic compounds	Typically associated with fuels and associated with chemicals used within the SI Group land off-site.	12	12
Semi-Volatile Organic compounds		3	0
Pesticide and herbicide screen	Typically associated with agricultural land.	5	6

Analytical Suite	**Rationale**	**No. of soil samples submitted**	**No. of groundwater samples submitted**
Polychlorinated biphenyls (PCBs)	Typically associated with transformer oils or hydraulic equipment such as within electrical substations.	4	3
Ammoniacal nitrogen, Chloride, Nitrate, Nitrite, Ortho-phosphate and sulphide	Associated with general agricultural areas and particularly within Nitrate Vulnerable Zones and in areas of heavy farming.	NA	12
Hardness	To be used as part of the groundwater assessment given its value alters metal compound's availability.	NA	12

4. SITE INVESTIGATION WORKS

4.1 Soils/Geology

A separate Geotechnical Assessment was conducted by Waldeck with a copy of the exploratory logs (a copy of exploratory logs is provided in Appendix 2).

The strata encountered beneath the Site were found to be broadly consistent with published geological information. The sequence of strata encountered from the ground surface is summarised below.

4.1.1 Made Ground

Made ground was present at all exploratory positions located in the area identified as landfill i.e. within the horse paddocks to the south of Straight Mile and the sheep field to the north. Made ground was observed to a maximum depth of 4.1m bgl. In general, made ground comprised gravelly silt and gravelly sand with brick, concrete and road materials with rare fragments of glass and wood.

Made ground was not identified at the exploratory positions located outside of the landfill areas.

Shallow deposits (<1m bgl) across the Site consisted of topsoil and/or grass cover. At the time of the investigation works, the northern field (to the south of Vicarage Road) was covered in the previous crop stubble. The field to the east was initially covered in maize but was then harvested during the investigation (prior to the installation of WS328).

4.1.2 Superficial deposits

Superficial drift deposits consisted of brown/orange/red fine to coarse sand with varying amounts of sandstone, mudstone and quartzite gravel with occasional sandy gravel deposits present. Sandy silty gravelly clay was observed at WS325, WS333, BH234, BH225, TP425, TP433, SP9 and SP10.

4.1.3 Solid Geology

The solid geology at the Site consisted of weathered Sandstone (Bromsgrove Sandstone) comprising red/brown silty, fine to medium sand underlies the superficial drift at the Site and tends to increase in strength with depth. The depth to the top of the Sandstone varied and in general was observed within 6m of the ground level across the Site.

4.1.4 Evidence of Contamination in Soils

The following olfactory and visual evidence of contamination was observed during the intrusive works:

- Made ground was present in all sixteen (16) locations within the identified landfill areas and generally comprised gravelly sand and sandy clay with brick and concrete fragments with rare wood, plastic and glass;
- A slight hydrocarbon odour was observed at TP428 at 0.3-0.85m bgl;
- An organic decomposition odour was observed in the shallow groundwater at BH233; and
- Slight dark staining of soil at TP429 at 0.3m bgl.

Headspace Screening

Soil samples were screened in the field for VOC contamination by headspace analysis. In the vast majority of soil samples, VOCs were either at very low concentrations (less than 0.3 parts per million (ppm)) or not detected (<0.1 ppm).

4.2 Groundwater

4.2.1 Monitoring Well Installations

Ten (10) cable percussion and rotary exploratory locations were installed with dedicated groundwater monitoring wells (see borehole logs presented in Appendix 2 for details of the installations).

Due to the general shallow nature of the Made Ground and the need to assess the shallow groundwater body, the response zones were all within the underlying natural strata targeting the superficial deposits and the upper weathered layers of the Bromsgrove Sandstone. No monitoring wells were installed to depths of beyond 10m below ground level.

4.2.2 Groundwater Levels

At the time of reporting, groundwater monitoring has been conducted on six separate occasions. Groundwater levels were monitored between 2.09m bgl (BH233) and 6.24m bgl (BH114) and generally within the superficial deposits and upper weathered Sandstone. When calculated with Ordnance Datum groundwater levels were observed between 101.40m Above Ordnance Datum (m AOD) within BH117 and 103.45m AOD within BH115. It is likely that groundwater is hydraulically connected between superficial and deeper bedrock deposits. A copy of the monitoring results can be viewed within Appendix 5B and details the specific physiochemical parameters monitored in Appendix 5C.

When plotting the groundwater levels using the Surfer programme, the north-eastern area of the Site appears to have a general westerly groundwater flow however, an irregular flow pattern is depicted in the south-western, landfilled area. This is likely attributed to the depth and variability of made ground in this area.

It should be noted that the monitoring wells were installed to monitor the 'shallow' groundwater (less than 10m in depth from ground level) and not to make an assessment on deeper groundwater flow. Groundwater level variance was limited to between 0.00m and 0.92m with the highest variance observed at BH115 in the north-west of the Site (within the landfill area).

It is considered likely that the shallow groundwater is hydraulically connected across the Site, although it was noted that some groundwater wells 'recharged' much less quickly that other indicating a changeable permeability depending on local ground conditions.

4.2.3 Evidence of Contamination in Groundwater

No visual or olfactory evidence of contamination (such as hydrocarbon sheen or solvent odour) was noted within the groundwater during sampling.

5. CHEMICAL ANALYSIS ASSESSMENT

5.1 Legislative Background

Under Part 2A of the Environmental Protection Act 1990 Section 78A(2), "contaminated land" is defined as "land which appears… to be in such a condition, by reason of substances in, on or under the land, that:

A. significant harm is being caused or there is a significant possibility of such harm being caused; or

B. significant pollution of controlled waters is being caused or there is a significant possibility of such pollution being caused"[4] .

Revised statutory guidance ("the Guidance") for local authorities on how to implement the regime, including the decision-making process on whether land is contaminated land in the legal sense, has been published by Defra and entered into force in April 2012. "Significant harm" is defined in the Guidance on risk based criteria and must be the result of one or more relevant 'contaminant linkages' relating to the land. The presence of a contaminant linkage relies on the Source-Pathway-Receptor concept, where all three factors must be present and potentially or actually linked for a potential risk to exist.

The Guidance introduced a new four-category system for classifying land under Part 2A, where Category 1 land poses an unacceptable risk to human health and Category 4 includes land where the level of risk posed is acceptably low. For six common contaminants (benzo(a)pyrene, cadmium, arsenic, benzene, hexavalent chromium and lead), a set of screening values have been developed and endorsed for use by Defra[5] (the Category 4 Screening Levels, or C4SLs) that describe a level of risk just below the Category 3/4 boundary set in the Statutory Guidance, i.e. where concentrations are below the C4SL, there is no risk or the level of risk is acceptably low.

The pollution of controlled waters is defined in Section 78A(9) of the Act as "the entry into controlled waters of any poisonous, noxious or polluting matter or any solid waste matter". The new Guidance stresses that the Part 2A regime is designed to identify and deal with 'significant pollution' and not lesser levels of pollution.

The risk assessment presented in this report is based on the C4SLs for those contaminants where values are available and a set of generic assessment criteria (the Ramboll GAC) for other contaminants, considered to be threshold-based screening concentrations at which a significant risk is not considered to be present to the relevant receptors.

5.2 Soil Analytical Results

The results of the soil laboratory analyses are summarised below, with the full analytical certificates presented as Appendix 3.

5.2.1 Soils - Inorganics

Table 5.1 below summarises the inorganic compounds present within the analysed samples.

[4] Water Act 2003 (Commencement No. 11) Order 2012

[5] SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination – Policy Companion Document, Defra, March 2014

Table 5.1: Summary of Inorganic Analysis for Soils

Analyte	No. of samples	Min Conc.	Max Conc.	Location and depth of Max Conc. (m bgl)	Guideline Value (Ramboll GAC)	No of samples exceeding	Location of Exceedance
Inorganics							
pH (pH units)	51	4.9	10.1	BH232 2.2-2.4	NA	NA	-
Arsenic	51	1.1	24.4	BH117 1.65-1.75	640	0	-
Beryllium	51	<0.5	2.4	WS327 0.60-0.75	12	0	-
Boron (water soluble)	51	<0.1	6.4	BH229 1.0-1.5	240000	0	-
Cadmium	51	<0.1	1.3	BH229 1.0-1.5	410	0	-
Chromium (total)	51	15.1	110	TP434 0.10-0.3	8600	0	-
Copper	51	<1	327	WS327 0.60-0.75	68000	0	-
Cyanide (total)	51	<0.5	1	BH114 0.2-0.4	14000	0	-
Lead	51	<5	287	WS327 0.60-0.75	2300	0	-
Mercury	51	<0.1	2.9	BH232 2.2-2.40	8.9	0	-
Nickel	51	4.0	41.3	WS330 0.5-0.6	980	0	-
Selenium	51	<1	1	BH231 0.3-0.6	12000	0	-
Vanadium	51	9	91	BH231 0.3-0.6	9000	0	-
Zinc	51	6	649	WS327 0.60-0.75	730000	0	-
Sulphate (2:1 Ext g/l)	51	0.0022	1.559	TP428 0.60-0.85	NC	NA	-
Notes: All concentrations are in mg/kg unless stated Ramboll GAC based on an industrial/commercial land use NC – no criteria NA – not applicable							

Metals were not detected above their respective GAC in any of the samples analysed.

pH values ranged from pH 4.9 (BH116 1.0-1.2m bgl) in the north-east of the Site to pH 10.1 (BH232 2.2-2.4m bgl) in the south-west of the Site.

Total Sulphate was detected at concentrations above the Methodology Detection Limit (MDL) in 40 out of 51 samples submitted for analysis. The highest concentration detected was TP428 0.60-0.85m bgl located in the sheep field (landfill area) corresponding to made ground and a slight hydrocarbon odour.

Total Cyanide was detected at concentrations above the MDL in 3 out 51 samples analysed. A maximum concentration of 1 mg/kg was detected at BH114 0.2-0.4m bgl.

Asbestos – Thirty two (32) samples from the Made Ground were submitted for asbestos screening. Six (6) of those samples were identified by the laboratory as containing quantifiable chrysotile fibre bundles (WS327, WS331, WS332, WS333, WS334 and BH115) and one (1) contained chrysotile cement (BH118A 0.65m bgl). The potential for exposure of ground-workers

involved in any future redevelopment works at the Site to asbestos in soil should be considered at the design stage of any planned works at these locations.

5.2.2 Soils - Organics

Table 5.2 below summarises the data for the organic compounds.

Concentrations of determinands detected above their respective analytical MDLs have been screened against corresponding GAC for human health considering commercial/ industrial site use.

Table 5.2: Summary of Organic Analysis for Soils

Analyte	No. of samples	Min Conc.	Max Conc.	Location of Max Conc.	Guideline Value (Ramboll GAC)	No of samples exceeding	Location of Exceedance
PAHs							
Naphthalene	51	<0.04	3.06	WS331 0.65-0.80	110	0	-
Acenaphthylene	51	<0.03	0.08	BH229 1.0-1.2	76000	0	-
Acenaphthene	51	<0.05	3.48	WS331 0.65-0.8	75000	0	-
Fluorene	51	<0.04	2.94	WS331 0.65-0.8	6000	0	-
Phenanthrene	51	<0.03	19.5	WS331 0.65-0.8	22000	0	-
Anthracene	51	<0.04	6.57	WS331 0.65-0.8	520000	0	-
Fluoranthene	51	<0.03	23.79	WS331 0.65-0.8	NR*	0	-
Pyrene	51	<0.03	18.99	WS331 0.65-0.8	54000	0	-
Benzo(a)anthracene	51	<0.06	12.17	WS331 0.65-0.8	NR*	0	-
Chrysene	51	<0.02	11.59	WS331 0.65-0.8	NR*	0	-
Benzo(b)fluoranthene	51	<0.05	15.06	WS331 0.65-0.8	NR*	0	-
Benzo(k)fluoranthene	51	<0.02	5.85	WS331 0.65-0.8	NR*	0	-
Benzo(a)pyrene	51	<0.04	12.25	WS331 0.65-0.8	76*	0	-
Indeno(1,2,3-cd)pyrene	51	<0.04	8.19	WS331 0.65-0.8	NR*	0	-
Dibenzo(ah)anthracene	51	<0.04	2.09	WS331 0.65-0.8	NR*	0	-
Benzo(g,h,i)perylene	51	<0.04	7.79	WS331 0.65-0.8	NR*	0	-
Hydrocarbons							
>C6-C8 Aliphatic	51	<0.1	0.1	BH225 0.5-0.7	5300	0	-
>C8-C10 Aliphatic	51	<0.1	3.5	BH117 2.8-2.95	1300	0	-
>C12-C16 Aliphatic	51	<0.4	9	BH117 1.65-1.75	4300	0	-
>C16-C21 Aliphatic	51	<7	35	WS327 2.0-2.5	1000000[1]	0	-
>C21-C35 Aliphatic	51	<7	116	WS330 0.5-0.6	1000000[1]	0	-
>EC8-EC10 Aromatic	51	<0.1	0.2	BH117 2.80-2.95	2200	0	-
>EC12-EC16 Aromatic	51	<4	10	BH117 1.65-1.75	35000	0	-

Analyte	No. of samples	Min Conc.	Max Conc.	Location of Max Conc.	Guideline Value (Ramboll GAC)	No of samples exceeding	Location of Exceedance
>C16-C21 Aromatic	51	<7	46	BH232 0.5-0.7	29000	0	-
>C21-C35 Aromatic	51	<7	187	BH229 1.0-1.5	29000	0	-
Volatile Organic Compounds (VOCs)							
Dichloromethane	12	<0.003	0.057	WS330 0.5-0.6	130	0	-
Thrichloroethene (TCE)	12	<0.003	0.06	TP428 0.6-0.85	0.68	0	-
Naphthalene	12	<0.027	0.063	BH229 1.0-1.5	100	0	-
Ethylbenzene	51	<0.003	0.005	WS327 2.0-2.5	3200	0	-
Xylene m, p	51	<0.005	0.009	WS327 2.0-2.5	467	0	-
Xylene o,	51	<0.003	0.005	WS327 2.0-2.5	467	0	-
Benzene	51	<0.005	0.059	BH232 2.2-2.4	15	0	-
Ethylbenzene	51	<0.005	0.053	BH117 2.80-2.95	3200	0	-
Semi-Volatile Organic Compounds (SVOCs)							
2-Methylnaphthalen	3	<0.01	0.04	BH229 1.0-1.50	NC	-	-
Carbazole	3	<0.01	0.075	BH229 1.0-1.50	4380[2]	0	-
Dibenzofuran	3	<0.01	0.091	BH229 1.0-1.50	25500[2]	0	-
Total phenol	3	<0.15	0.22	BH225 0.5-0.7	380	0	-
Other Organic Parameters							
Fraction of Organic Carbon	11	0.001	0.04	WS327 0.2-0.3	NC	NA	NA
Pesticides and Herbicides							
Endosulphan I (µg/kg)	5	<10	40	TP425 0.1-0.25	NC	NA	NA
p,p' TDE (µg/kg)	5	<10	14	WS325 0.30-0.40	NC	NA	NA
p,p' DDT (µg/kg)	5	<10	44	WS238 0.4-0.5	NC	NA	NA

Notes:

All concentrations are in mg/kg unless stated

Only those determinands which were detected above the MDL are included within the above table

Ramboll GAC based on an industrial/commercial land use

NC – no criteria

NA – not applicable

NR*/* - Not Required as Benzo(a)pyrene used as surrogate marker for PAHs.

[1]: GAC for Aliphatic C16-C35 used

[2]: No REH GAC available therefore ENVIRON GAC used

Organic Summary

No exceedances of Ramboll Generic Assessment Criteria for commercial or industrial land use were recorded.

PAHs were detected at concentrations above the respective MDL in twenty one (21) out of fifty one (51) samples analysed. No concentrations of individual PAHs were detected above the relevant screening value.

Individual SVOC compounds were detected above the MDL in two out of three samples analysed. In addition, three separate compounds included in the pesticide / herbicide analysis suite were detected (each at different sample locations).

Concentrations of PCBs were not detected in excess of the relevant MDL.

5.2.3 Soil Analytical Results Summary

None of the samples tested were found to contain an exceedance of the guideline values for any compounds analysed.

Asbestos was encountered in seven (7) soil samples taken from the Site and was noted to be chrysotile. All samples were obtained from infill material within the former landfill area.

5.3 Water Analytical Results

The results of the groundwater laboratory analyses are summarised below, with the full analytical certificates provided by the laboratory contained in Appendix 4.

The groundwater assessment has been undertaken with reference to the Site and its situation in the surrounding environment i.e. the nearby watercourses and the underlying Principal Aquifer relating to bedrock geology, as follows:

- human health has been assessed against criteria derived to safeguard human health following exposure to contaminants that have volatilised from groundwater and migrated to air (where they may be inhaled); and
- the water environment has been assessed primarily against UK Drinking Water Standards (DWS) Where no published DWS are available, Environmental Quality Standards (EQS). or an alternative appropriate international standard has been applied for assessment purposes.

5.3.1 Water Assessment – Human Health

Determinands detected above the MDL have been compared to Ramboll criteria derived to safeguard human health (e.g. from a potential volatilisation pathway). The reported results are below the available criteria.

5.3.2 Controlled Water Assessment – Environmental Assessment

Table 5.3 below summarises the data for those analysed groundwater samples where at least one (1) determinand was detected at a concentration exceeding the laboratory detection limit. The range of concentrations measured within the samples is shown, as well as the location of the maximum concentration measured and any samples which exceeded the Ramboll GAC protective of the water environment (EQS or other applicable guideline value).

Table 5.3: Summary of Water Analytical Results – Inorganic Parameters

Analyte	No. of samples	Min Conc.	Max Conc.	Location of Max Conc.	Guideline Value (DWS or other applicable)	No locations where exceedances present	Location of Exceedance
Inorganics							
pH	12	4.42	7.52	BH233	6-9	2	BH226, BH229
Arsenic	12	<2.5	8.4	BH233	10	0	-
Beryllium	12	<0.5	14.6	BH212	4	1	BH226
Boron	12	46	610	BH231	1,000	0	-
Cadmium	12	<0.5	1.4	BH229	5	1	BH229
Total Chromium	12	<1.5	3.4	BH231	50	0	-
Copper	12	<7	43	BH117	2,000	1	BH117
Nickel	12	<2	30	BH229	20	2	BH226, BH229
Selenium	12	<3	11	BH114	10	1	BH114
Vanadium	12	<1.5	4.3	WS330	20*	0	-
Zinc	12	<3	319	BH230	10.9*	4	BH115, BH226, BH230, BH231
Ammoniacal nitrogen as N (mg/l)	12	<0.03	8.22	BH231	NC	NA	-
Total Hardness (as $CaCO_3$) (mg/l)	12	50	509	BH231	NC	NA	-
Sulphate (mg/l)	12	3.9	257.9	BH229	250	1	BH229
Chloride (mg/l)	12	8.4	180.1	WS331	250	NA	-
Nitrate as NO3 (mg/l)	12	<0.2	98.1	BH113	50	2	BH230, BH226
Nitrite as NO2 (mg/l)	64	<0.02	1.03	WS331	0.5	1	WS331
Orthophosphate as PO4 (mg/l)	64	<0.06	0.14	SW5	NC	NA	-

Notes:

All concentrations are in µg/L unless stated

Ramboll GAC based on UK Environmental Quality Standards (EQS) unless noted as below:-

* - In the absence of a EQS, UK Drinking Water Standards (DWS) have been used.

** - In the absence of a UK DWS or EQS, suitable international standards have been applied.

^ - Value determined by the specific hardness at each location.

NC – no criteria

NA – not applicable

5.3.3 Waters – Organic Parameters

Table 5.4 below summarises the data for those analysed samples where at least one (1) determinand was detected at a concentration exceeding the laboratory detection limit.

Table 5.4: Water results - Organic Parameters

Analyte	No. of samples	Min Conc.	Max Conc.	Location of Max Conc.	Guideline Value (DWS or other applicable)	No of locations exceedances present	Location of Exceedance
Organics							
PAHs							
Naphthalene	12	<0.1	0.8	WS331	2*	0	-
Acenaphthylene	12	<0.013	0.11	WS330	NA	0	-
Acenaphthene	12	<0.013	0.365	WS331	400**	0	-
Fluorene	12	<0.014	0.185	WS331	220**	0	-
Phenanthrene	12	<0.011	0.41	WS331	NA	0	-
Anthracene	12	<0.013	0.084	WS331	0.1	0	-
Fluoranthene	12	<0.012	0.134	WS331	0.0063	8	BH114, BH115, BH116, BH117, BH231, BH233, WS330, WS331
Pyrene	12	<0.013	0.103	WS331	87**	0	-
Benzo(a)anthracene	12	<0.015	0.034	WS331	0.029	2	BH233, WS331
Chrysene	12	<0.011	0.087	WS331	2.9	0	-
Benzo(bk)fluoranthene	12	<0.018	0.137	BH116	0.1*A	0	-
Benzo(a)pyrene	12	<0.016	0.039	BH116	0.01	8	BH114, BH115, BH116, BH117, BH231, BH233, WS330, WS331
Indeno(123cd)pyrene	12	<0.011	0.064	BH117	0.1*A	0	-
Benzo(ghi)perylene	12	<0.011	0.07	BH117	0.1*A	0	-
Benzo(b)fluoranthene	12	<0.01	0.1	BH116	0.03	0	-
Benzo(k)fluoranthene	12	<0.01	0.04	BH116	0.03	0	-
Volatile Organic Compounds (VOCs)							

Analyte	No. of samples	Min Conc.	Max Conc.	Location of Max Conc.	Guideline Value (DWS or other applicable)	No of locations exceedances present	Location of Exceedance
Chloroform	12	<2	28	BH114	2.5*	2	BH116, BH114
Bromodichloromethane	12	<2	10	BH114	100^	0	-
Dibromochloromethane	12	<2	3	BH114	100^	0	-

Notes:

All concentrations are in µg/L unless stated

Ramboll GAC based on UK Drinking Water Standards (DWS)unless noted as below:-

* - In the absence of a DWS, Environmental Quality Standards (EQS) have been used

*A – Total PAH DWS adopted which is the sum of benzo(b)fluoranthene, benzo(k)fluoranthene, indeno(123-cd)pyrene and benzo(ghi)perylene

** - In the absence of a UK DWS or EQS, Regional Screening Level for Tapwater (US EPA, April 2009) has been used

^Previous ENVIRON GAC used

NC – no criteria

NA – not applicable

5.3.4 Groundwater Sample Summary

The following inorganic determinands were detected at concentrations above the screening criteria:

- pH values were slightly acidic at BH226 and BH229 with reported values of 4.42 and 5.48, respectively;
- Metals including beryllium, cadmium, copper, nickel, selenium, and zinc were detected above their respective criteria at select locations. Where detected, the concentrations are generally less than one order of magnitude above the adopted criteria; and
- Marginal sulphate, nitrate and nitrite exceedances were also reported.

The following organic determinands were detected at concentrations above the most suitable screening criteria:

- Select PAH compounds including Fluoranthene, Benzo(a)anthracene and Benzo(a)pyrene were also detected at select locations at concentrations above the stringent DWS screening criterion; and
- VOC results were below the adopted screening criteria with the exception of chloroform at BH114 and BH116.

5.3.5 Non-Aqueous Phase Liquids

No evidence of Non-Aqueous Phase Liquids (NAPL) in either light or dense forms were encountered in soil or groundwater at the Site.

6. GROUND GAS ASSESSMENT

6.1 Ground Gas Assessment Criteria

Ground gas can be produced as a result of the decomposition of organic materials and may also originate from natural sources, such as coal seams and organic rich soils. The principal components of ground gas are methane and carbon dioxide, although other gases may be present in trace concentrations. Ground gas can present a hazard to Site occupants and property as result of flammable/explosive hazards, physiological effects, odour and effects on vegetation.

There is no one specific guidance document relating to ground gas measurement methods, risk assessment, and gas protection measures. Several documents have been published since the early 1990s and generally provide guidance for new developments, some of which have been more recently revised.

Whilst this report has been produced in consideration of the proposed commercial / industrial usage of the Site, reference has been made to the following guidance documents as part of this assessment:

Table 6.1: Ground Gas Assessment Criteria

Table 6.1: Ground Gas Assessment Criteria	
Constituent	**Reference Documents**
Methane and Carbon Dioxide	• *Assessing Risks Posed by Hazardous Ground Gases to Buildings*. Report C665, Construction Industry Research and Information Association (CIRIA), 2007. • Code of Practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings. BSi 8485:2015. • The Building Regulations, Approved Document C: Site preparation and resistance to contaminants and moisture, (2004) • Guidance on Evaluation of Development Proposals on Sites where Methane and Carbon Dioxide are Present. Report Edition No. 4, NHBC, March 2007.
Oxygen	• Waste Management Paper 27 – Guidelines for Building Houses near Landfill Sites. Department of the Environment 1991.

Carbon Dioxide and Methane

Guidance on undertaking ground gas risk assessment is provided by the Construction Industry Research and Information Association (CIRIA), Report C665 "Assessing Risks Posed by Hazardous Ground Gases to Buildings" (2007). The guidance consolidates the requirement for good practice in site investigation, the collection of relevant data and monitoring programmes in the context of a risk based approach to gas contaminated ground.

Two semi-quantitative methods are set out in the guidance for the assessment of ground gas risk, one method for low rise housing with gardens and the other for all remaining development types, including commercial/industrial development.

The method applicable for all developments with the exception of low rise housing is called the 'Modified Wilson and Card Classification'. This is applicable to all development types except low rise housing, and makes no assumption that an underfloor void is present within the development. The method by Wilson and Card was a development of the one proposed in CIRIA publication R149 (1995).

The 'Modified Wilson and Card Classification' uses gas concentrations and borehole flow rates to define a characteristic situation for the Site, by calculating a Gas Screening Value (GSV). The GSV is calculated using a worst case scenario (i.e. the maximum gas concentration and flow rates detected) across the entire Site during the monitoring period. The GSV is calculated for both methane and carbon dioxide, and the 'Characteristic Situation' is derived by comparison with a table relevant to each method. It is important to note that GSVs are not absolute thresholds but guideline values.

The NHBC has developed a characterisation system similar to Wilson and Card system but is specific to low rise housing development with a clear ventilated underfloor void. This risk based approach compares measured ground gas rates to 'generic traffic' lights scenarios. The assessment also generates a gas screening value using worst case scenario and flow rates. The thresholds are based on a number of assumptions regarding the proposed housing structure and designers should ensure that these assumptions are appropriate before proceeding.

The Building Regulations, Approved Document C (2004) states that where methane concentrations do not exceed 1% and that the floor of the building to be constructed is suspended and ventilated, no further protection needs to be provided. Above 1% by volume there is a need to consider possible measures to prevent gas ingress into new buildings.

Approved Document C also states that there is a need to consider possible measures to prevent gas ingress into new buildings if concentrations of carbon dioxide above 1.5% are detected in the ground, and that measures are definitely required at concentrations above 5%.

Oxygen

Waste Management Paper 27 (WMP27) states that a minimum concentration of 18% oxygen is required to prevent asphyxiation.

6.2 Ground Gas Monitoring Results

The following section presents a summary of the ground gas monitoring results obtained as part of the four complete visits undertaken at the Site to date[6].. Where appropriate the results were screened against Gas Screening Values (GSVs). The results of the ground gas monitoring are presented in full in Appendix 5A, with a summary presented within the following sections.

The monitoring was undertaken on the following dates:

- 1st Round: 18th and 19th October 2017;
- 2nd Round: 26th October 2017;
- 3rd Round:31st October and 1st November 2017;
- 4th Round: 1st December 2017;
- 5th Round: 21st December 2017 (WS328); and
- 6th Round: 3rd January 2018 (WS328).

6.2.1 Flow Rates

Flow rates in litres per hour (l/h) were negligible at the majority of locations with the highest flow recorded at 0.1 l/hr.

[6] Due to a delay in the installation of WS328, the location was first monitored as part of the third monitoring round. Therefore a further two visits were undertaken.

6.2.2 Oxygen

Oxygen concentrations at the Site ranged between <0.1% v/v in WS327 to 21.0% v/v in WS325. Oxygen concentrations were detected below the guidance value of 18% v/v for seven (7) out of the nine (9) gas monitoring locations In general, slightly reduced oxygen concentrations correlated with elevated concentrations of methane or carbon dioxide.

6.2.3 Methane and Carbon Dioxide

Methane was recorded at either below the instrument detection level (<0.1% v/v) at seven (7) gas monitoring locations. The highest concentration recorded was 18.3% v/v at WS330, however during the following monitoring round, methane was recorded below the instrument detection level on two further occasions and at 7.1% v/v on one occasion.

Carbon dioxide was recorded in all of the exploratory locations between 0.9% v/v (WS332) and 12.8% v/v (WS330).

6.2.4 Atmospheric Pressure

The first and third monitoring rounds were undertaken during a period of falling pressure and heavy rain showers. The second and fourth monitoring rounds (26th October 2017) were undertaken during period of slightly rising pressure. The fifth and sixth monitoring rounds (where WS328 was monitored) were undertaken during periods of falling pressures. See Appendix 5 for further details.

6.2.5 Significance of Ground Gas Monitoring & Analysis

The assessment has been undertaken in the context of the proposed commercial/industrial use in light of the proposed redevelopment of the Site. The ground gas results have been assessed in accordance with CIRIA Report 665 – Assessing Risks posed by Hazardous Ground Gases to Buildings (2007). As discussed above, CIRIA 665 was developed to assess the requirement for gas mitigation measures within new buildings and not to determine risk and gas mitigation measures which should be employed with respect to current buildings.

CIRIA Report 665 incorporates the methodology within Wilson & Card Reliability and Risk in Gas Protection Design (1999) to develop site specific Gas Screening Values (GSV). The GSV is derived by the following calculation:

GSV (l/hr) = borehole flow rate (l/hr) x gas concentration (% v/v).

Given this assessment is based upon four monitoring rounds and thus represents a preliminary gas assessment the maximum flow rate for the entire Site was used within the calculation. This provides a worst-case scenario based upon current preliminary measurements.

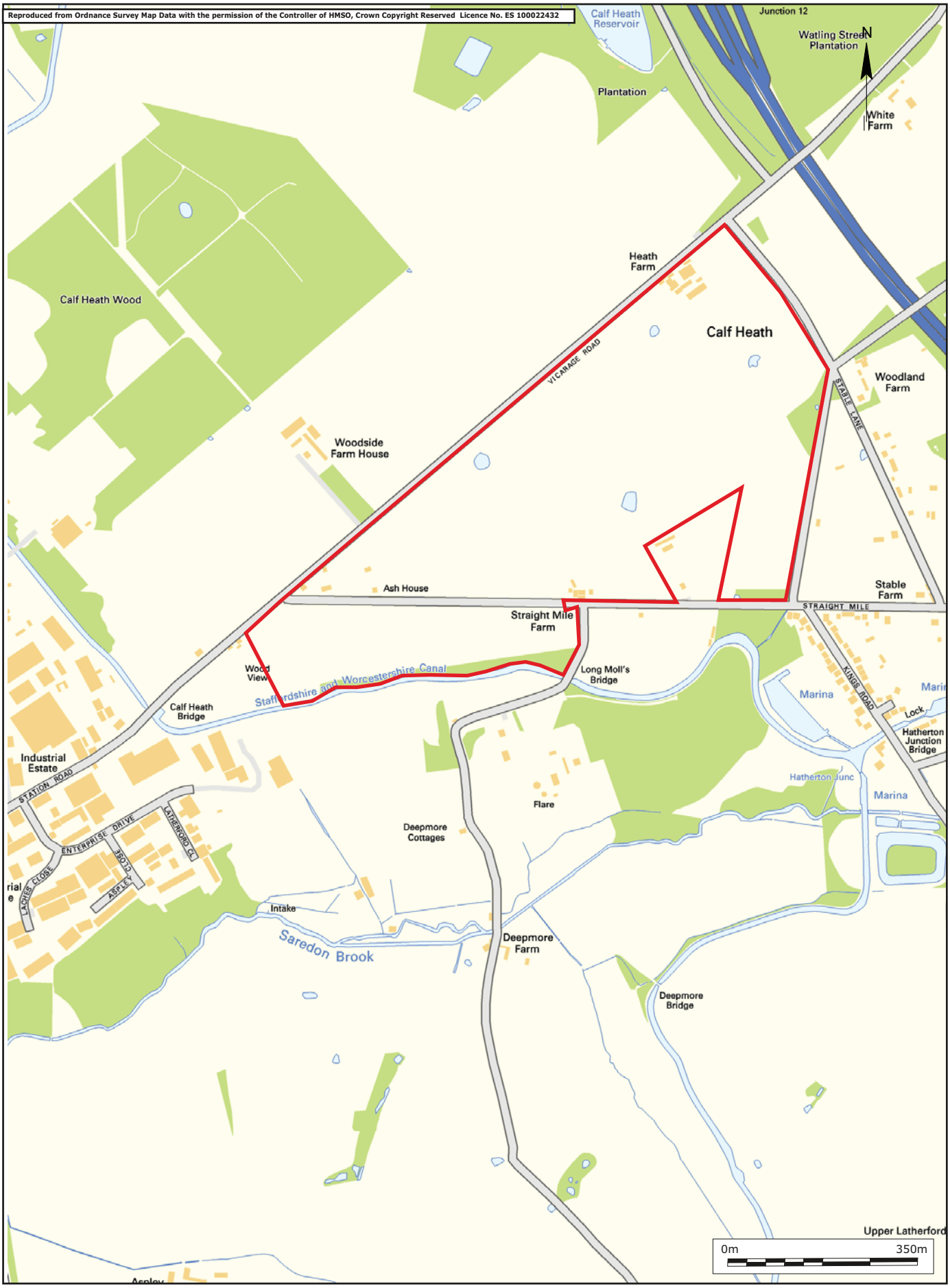
The maximum flow rate of 0.1 l/hr was detected, although it was noted this was a peak value. The following methane and carbon dioxide Gas Screening Values (GSV) were calculated:

- Methane GSV = Max methane conc. (18.3% v/v) X max flow rate (0.1 l/hr) /100 = 0.0183 l/hr
- Carbon Dioxide GSV = Max Carbon dioxide conc. (12.8% v/v) X max flow rate (0.1 l/hr) /100 = 0.0128 l/hr.

The above presents the worst-case maximum GSV for the whole Site. Therefore, in accordance with CIRIA Report 665, and noting 'additional factors' where concentrations above 1% methane and 5% carbon dioxide should consider an increase of Characteristic Situation, the calculated GSVs for the whole Site corresponds to Characteristic Situation 2 'Low Risk', with the recorded ground gas concentrations considered 'typical of made ground'.

This assessment presents a worst-case scenario and is based upon a single maximum gas flow rate proposed across the entire Site. Furthermore the requirement of specific building layouts has not been taken into account.

APPENDIX 1
FIGURES



Key

Site Boundary

Title: Figure 1 - Site Boundary Plan	Site: Four Ashes, Wolverhampton	Date: November 2017	RAMBOLL ENVIRON
		Scale: See scale bar	
Project No.: UK15-22306_WMI_SE	Client: Four Ashes Ltd.	Issue: 1 Drawn by: EB	

Legend

- Site Boundary
- Rotary_Borehole
- Cable Percussion Borehole
- Window Sample
- Trial_Pit
- Soakage Test Pit
- CPT
- 'Deep' GROUNDWATER WELL
- 'Shallow' GAS WELL

Figure Title

Figure 2. Exploratory Locations

Project Name

West Midlands Interchange

Project Number	Figure No.
UK15-22306	1
Date	Prepared By
January 2018	EB
Scale	Issue
1:4,000 @A3	1

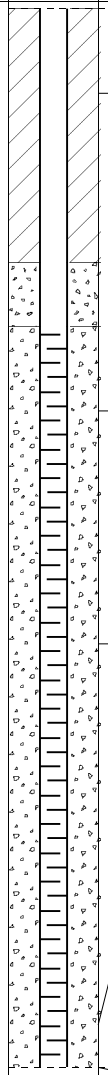
Client

Four Ashes Ltd.

RAMBOLL

APPENDIX 2
WALDECK BOREHOLE LOGS

Project: WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client: WALDECK CONSULTING Engineer:	Drilling Methods: ROTARY DYNAMIC SAMPLING WITH ROTARY FOLLOW ON. CASED 168mm DIAMETER GROUND LEVEL TO 4.80m OPEN HOLE 146mm DIAMETER 4.80 TO 19.50m	Hole No. **BH114** Sheet 1 of 4 Job No **14317GI2**
Ground Level: 108.30 m.A.O.D.	Coordinates: 393178 m.E. 309343 m.N.		



WATER			STRATA				SAMPLING/IN SITU TEST/FIELD RECORDS										OTHER TESTS AND NOTES
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Core Run	TCR %	SCR %	RQD %	FI	Type & No	Blows	W %	
				Topsoil (Dark brown very silty fine-medium sand with some rounded-subrounded fine-medium quartzite gravel)		107.90	0.40										Hand excavated from ground level to 1.20m
				Light brown/orange brown silty fine-coarse SAND/ GRAVEL. Gravel composed of subangular-subrounded fine-coarse quartzite and rare sandstone (Glaciofluvial Deposits)				0.70						D1			Particle size distribution
								1.20-2.70						X2			Percussive sampling from 1.20 to 4.80m (128mm diameter)
								1.30						D2			Organic content and BRE SD1 chemical suite
				Brown/orange silty very sandy rounded-subangular fine-coarse quartzite and sandstone GRAVEL (Glaciofluvial Deposits)		106.40	1.90										
								2.50						D3			Particle size distribution
								2.70-4.20						X3			
				Red/brown locally yellow/brown clayey silty fine-medium SAND (Wildmoor Sandstone Formation)		105.30	3.00	3.00						D4			Particle size distribution and sedimentation
								4.20-4.80						X4			
				Extremely to very weak dark red/brown fine-medium SANDSTONE. Fractures are horizontal and occasionally subhorizontal very closely-closely spaced, planar, rough (Wildmoor Sandstone Formation)		103.50	4.80	4.80-6.30						C5			Rotary cored 4.80 to 19.50m (146mm diameter), water flush
						103.30	5.00										If (4.8-6.3m): NI/50/120

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min

WATER
- ▼ 1 First Strike
- ▽ 2 Subsequent Strike
- N - Overnight Depth
- C- Completion Depth
- S Seepage not rising

SAMPLE KEY
- TCR Total Core Recovery
- SCR Solid Core Recovery
- RQD Rock Quality Designation
- FI Fracture Index

TEST KEY
- S Standard penetration test
- C Cone penetration test
- K Permeability test

BLOWS
- N = N value
- 26/150 blows, for 150mm, drive after seating
- 26*, blows for part or whole of seating drive only

Fieldwork By: GEL
Dates: 09/10/17 to 10/10/17
Log: NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Drilling Methods	ROTARY DYNAMIC SAMPLING WITH ROTARY FOLLOW ON. CASED 168mm DIAMETER GROUND LEVEL TO 4.80m OPEN HOLE 146mm DIAMETER 4.80 TO 19.50m	Hole No.	**BH114**
		Engineer				Sheet	2 of 4
Ground Level	108.30 m.A.O.D.	Coordinates	393178 m.E. 309343 m.N.			Job No	**14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST/FIELD RECORDS										OTHER TESTS AND NOTES
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Core Run	TCR %	SCR %	RQD %	FI	Type & No	Blows	W %		
				Extremely weak to weak dark red/brown fine-medium SANDSTONE. Fractures are horizontal and occasionally subhorizontal very closely-closely spaced, planar, rough (Wildmoor Sandstone Formation)				5.50		73	50	7		D5				Point load test
				- locally light brown/yellow				6.30-7.80						C6				If (6.3-9.3m): NI/100/170
				Weak to medium strong occasionally extremely weak red/brown occasionally light brown fine-medium SANDSTONE. Fractures are subhorizontal/ horizontal, planar, rough (Wildmoor Sandstone Formation)		101.80	6.50											
								7.80-9.30		100	93	20		C7				
								8.50		100	96	5		D6				Point load test
09/10/17	4.80	2.40																
10/10/17	4.80	6.10 N						9.30-10.80						C8				If (9.3-10.8m): NI/150/240
						98.30	10.00			100	87	67						

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min

WATER
- ▼ 1 First Strike
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- S Seepage not rising

SAMPLE KEY
- TCR Total Core Recovery
- SCR Solid Core Recovery
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BLOWS
- N = N value
- 26/150 blows, for 150mm, drive after seating
- 26*, blows for part or whole of seating drive only

Fieldwork By	GEL
Dates	09/10/17 to 10/10/17
Log	NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Drilling Methods	ROTARY DYNAMIC SAMPLING WITH ROTARY FOLLOW ON. CASED 168mm DIAMETER GROUND LEVEL TO 4.80m OPEN HOLE 146mm DIAMETER 4.80 TO 19.50m	Hole No.	**BH114**
		Engineer				Sheet	3 of 4
Ground Level	108.30 m.A.O.D.	Coordinates	393178 m.E. 309343 m.N.			Job No	**14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST/FIELD RECORDS										OTHER TESTS AND NOTES
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Core Run	TCR %	SCR %	RQD %	FI	Type & No	Blows	W %		
				Very weak to medium strong red/brown occasionally light brown fine-medium SANDSTONE. Fractures are subhorizontal/horizontal, planar, rough (Wildmoor Sandstone Formation)														
				- coarse SANDSTONE between 10.80 and 11.40m				10.80-12.00						C9				If (10.8-12.2m): NI/80/90
								11.50						D7				Point load test
				- recovered as angular-subangular coarse SANDSTONE GRAVEL between 12.00 and 12.20m				12.00-13.50						C10				
						96.20	12.10											If (12.2-19.2m): NI/250/450
				Weak red/brown fine SANDSTONE. Fractures are horizontal, occasionally subhorizontal very closely-closely spaced, planar, rough (Wildmoor Sandstone Formation)														
								13.50-15.00						C11				
						94.70	13.60											
				Very weak/weak occasionally medium strong fine-medium occassionally medium-coarse SANDSTONE. Fractures are closely occasional medium spaced horizontal/subhorizontal, planar, rough (Wildmoor Sandstone Formation)														
								14.30						D8				Point load test
						93.30	15.00	15.00-16.50						C12				

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after			
		5min	10 min	15 min	20 min

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BLOWS
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Fieldwork By	GEL
Dates	09/10/17 to 10/10/17
Log	NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Drilling Methods	ROTARY DYNAMIC SAMPLING WITH ROTARY FOLLOW ON. CASED 168mm DIAMETER GROUND LEVEL TO 4.80m OPEN HOLE 146mm DIAMETER 4.80 TO 19.50m	Hole No.	**BH114**
		Engineer				Sheet	4 of 4
Ground Level	108.30 m.A.O.D.	Coordinates	393178 m.E. 309343 m.N.			Job No	**14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST/FIELD RECORDS										OTHER TESTS AND NOTES
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Core Run	TCR %	SCR %	RQD %	FI	Type & No	Blows	W %		
				Weak occasionally medium strong fine-medium occasionally medium-coarse SANDSTONE. Fractures are closely occasionally medium spaced horizontal/subhorizontal, planar, rough (Wildmoor Sandstone Formation)														
				- occasionally slightly yellow/brown				16.20-16.40						D9				Unconfined compressive strength
								16.50-18.00						C13				
								17.35-17.80						D10				Unconfined compressive strength
				- occasionally very weak rounded-subrounded fine-medium quartzite gravel				18.00-19.50						C14				
																		If (19.2-19.5m): NI/30/60
								18.80						D11				Point load test
				- vertical fracturing caused by sampling														
10/10/17	4.80	C				88.80	19.50	19.50										Borehole complete at 19.50m
																		50mm diameter HDPE pipe installed to 9.00m Pipework capped and protected with raised lockable cover

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after			
		5min	10 min	15 min	20 min

WATER
- ▼ 1 First Strike
- ▽ 2 Subsequent Strike
- N - Overnight Depth
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- S Seepage not rising

SAMPLE KEY
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TEST KEY
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- K Permeability test

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Fieldwork By	GEL
Dates	09/10/17 to 10/10/17
Log	NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Drilling Methods	ROTARY DYNAMIC SAMPLING WITH ROTARY FOLLOW ON. CASED 168mm DIAMETER GROUND LEVEL TO 4.70m OPEN HOLE 146mm DIAMETER 4.70 TO 19.80m	Hole No.	**BH115**
		Engineer				Sheet	1 of 4
Ground Level	107.00 m.A.O.D.	Coordinates	392707 m.E. 309034 m.N.			Job No	**14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST/FIELD RECORDS										OTHER TESTS AND NOTES
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Core Run	TCR %	SCR %	RQD %	FI	Type & No	Blows	W %		
				Topsoil (Dark brown/brown silty fine-medium sand with some rounded-subrounded fine-coarse quartzite gravel)		106.60	0.40											Hand excavated from ground level to 1.10m
				Made Ground (Dark brown slightly clayey silty medium-coarse sand and gravel. Gravel composed of subangular-subrounded fine-coarse sandstone and brick and occasional fragments of glass, concrete and slag)				0.60						D1				
								1.10-2.60						X2				Percussive sampling from 1.10 to 4.70m (128mm diameter)
								1.40						D2				BRE SD1 chemical suite
				- becoming very clayey														
				Made Ground (Red/brown brick rubble)		104.90	2.10											
				Made Ground (Soft/firm dark grey/brown sandy very gravelly clay. Gravel composed of angular-subangular medium-coarse brick, sandstone and rare slag, concrete, granite, mudstone)		104.70	2.30	2.60-4.10						X3				'Damp' from approximately 2.60m
								3.50						D3				BRE SD1 chemical suite
				- becoming black/dark brown Red/brown clayey very silty fine-medium SAND, slightly cemented (Wildmoor Sandstone Formation)		102.90	4.10	4.10-4.70						X4				
								4.20						D4				Particle size distribution and sedimentation
05/10/17	4.70	3.40																
06/10/17	4.70	3.50 N		Extremely weak dark red/brown fine-medium SANDSTONE. Fractures are generally extremely closely spaced, subhorizontal occasionally subvertical, planar, rough. Recovered in part as subangular medium-coarse gravel (Limited recovery) (Wildmoor Sandstone Formation)		102.30	4.70	4.70-6.20						C5				Rotary cored 4.70 to 19.80m (146mm diameter), water flush If (4.7-6.2m): NI/-/-
						102.00	5.00											

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min

WATER
- ▼ 1 First Strike
- ▽ 2 Subsequent Strike
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- RQD Rock Quality Designation
- FI Fracture Index

TEST KEY
- S Standard penetration test
- C Cone penetration test
- K Permeability test

BLOWS
- N = N value
- 26/150 blows, for 150mm, drive after seating
- 26*, blows for part or whole of seating drive only

Fieldwork By	GEL
Dates	05/10/17 to 06/10/17
Log	NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Drilling Methods	ROTARY DYNAMIC SAMPLING WITH ROTARY FOLLOW ON. CASED 168mm DIAMETER GROUND LEVEL TO 4.70m OPEN HOLE 146mm DIAMETER 4.70 TO 19.80m	Hole No.	**BH115**
		Engineer				Sheet	2 of 4
Ground Level	107.00 m.A.O.D.	Coordinates	392707 m.E. 309034 m.N.			Job No	**14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST/FIELD RECORDS										OTHER TESTS AND NOTES
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Core Run	TCR %	SCR %	RQD %	FI	Type & No	Blows	W %		
				Extremely weak dark red/brown fine-medium SANDSTONE. Fractures are generally extremely closely spaced, subhorizontal occasionally subvertical, planar, rough. Recovered in part as subangular medium-coarse gravel (Limited recovery) (Wildmoor Sandstone Formation)						52	0	0						
						100.80	6.20	6.20-7.70						C6				If (6.2-7.7m): NI/25/80
				Extremely/very weak red/brown locally yellow/light brown, fine-medium SANDSTONE. Fractures are extremely/very closely spaced horizontal/ subhorizontal, planar, rough (Wildmoor Sandstone Formation)						80	47	0						
				- light brown/orange brown between 7.20 and 7.35m														
								7.70-9.20						C7				If (7.7-10.0m): NI/70/120
										97	35	13						
				Very weak red/brown locally yellow/brown fine-medium SANDSTONE. Fractures are very closely/ closely spaced, horizontal occasionally subhorizontal, planar, rough (Wildmoor Sandstone Formation)		97.80	9.20	9.20-10.70						C8				
06/10/17	4.70	C																
						97.00	10.00			97	93	50						

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min

WATER
- ▼ 1 First Strike
- ▽ 2 Subsequent Strike
- N - Overnight Depth
- C- Completion Depth
- S Seepage not rising

SAMPLE KEY
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BLOWS
- N = N value
- 26/150 blows, for 150mm, drive after seating
- 26*, blows for part or whole of seating drive only

Fieldwork By	GEL
Dates	05/10/17 to 06/10/17
Log	NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Drilling Methods	ROTARY DYNAMIC SAMPLING WITH ROTARY FOLLOW ON. CASED 168mm DIAMETER GROUND LEVEL TO 4.70m OPEN HOLE 146mm DIAMETER 4.70 TO 19.80m	Hole No.	**BH115**
		Engineer				Sheet	3 of 4
Ground Level	107.00 m.A.O.D.	Coordinates	392707 m.E. 309034 m.N.			Job No	**14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST/FIELD RECORDS										OTHER TESTS AND NOTES
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Core Run	TCR %	SCR %	RQD %	FI	Type & No	Blows	W %		
				Very weak to weak red/brown locally yellow/brown fine-medium SANDSTONE. Fracture are very closely/closely spaced, horizontal occasionally subhorizontal, planar, rough (Wildmoor Sandstone Formation)				10.20						D5				Point load test If (10.0-12.2m): NI/150/190
				- occasional black specks and black colouration on fracture surface from 10.70m				10.70-12.20						C9				
										98	91	83						
								12.20-13.70						C10				If (12.2-17.3m): NI/250/400
								12.40-12.70						D6				Unconfined compressive strength
				- single subvertical fracture between 12.80 and 13.10m - fractures becoming closely/medium spaced						97	74	53						
								13.70-15.20						C11				
										100	89	65						
						92.00	15.00											

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after			
		5min	10 min	15 min	20 min

WATER
- ▼ 1 First Strike
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- N - Overnight Depth
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SAMPLE KEY
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- N = N value
- 26/150 blows, for 150mm, drive after seating
- 26*, blows for part or whole of seating drive only

Fieldwork By	GEL
Dates	05/10/17 to 06/10/17
Log	NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Drilling Methods	ROTARY DYNAMIC SAMPLING WITH ROTARY FOLLOW ON. CASED 168mm DIAMETER GROUND LEVEL TO 4.70m OPEN HOLE 146mm DIAMETER 4.70 TO 19.80m	Hole No.	**BH115**
		Engineer				Sheet	4 of 4
Ground Level	107.00 m.A.O.D.	Coordinates	392707 m.E. 309034 m.N.			Job No	**14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST/FIELD RECORDS										OTHER TESTS AND NOTES
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Core Run	TCR %	SCR %	RQD %	FI	Type & No	Blows	W %		
				Very weak red/brown loally yellow/brown fine-medium SANDSTONE. Fractures are very closely/ closely spaced, horizontal occasionally subhorizontal, planar, rough (Wildmoor Sandstone Formation)				15.20-16.70						C12				
										100	97	88						
								16.70-17.30						C13				
										100	78	78						
						89.70	17.30	17.30-18.30						C14				If (17.3-19.8m): NI/80/150
				Very weak occasionally extremely weak/weak dark red/brown medium-coarse SANDSTONE. Fractures are very closely/closely spaced, generally subhorizontal, planar, rough. Some subvertical fractures (Wildmoor Sandstone Formation)				17.45-17.65						D7				Point load test
										72	33	33						
								18.30-19.80						C15				
										100	34	27						
																		Borehole complete at 19.80m
																		50mm diameter HDPE pipe installed to 9.00m
						87.20	19.80	19.80										Pipework capped and protected with raised lockable cover

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after			
		5min	10 min	15 min	20 min

WATER

- ▼ 1 First Strike
- ▽ 2 Subsequent Strike
- N - Overnight Depth
- C- Completion Depth
- S Seepage not rising

SAMPLE KEY

- TCR Total Core Recovery
- SCR Solid Core Recovery
- RQD Rock Quality Designation
- FI Fracture Index

TEST KEY

- S Standard penetration test
- C Cone penetration test
- K Permeability test

BLOWS

- N = N value
- 26/150 blows, for 150mm, drive after seating
- 26*, blows for part or whole of seating drive only

Fieldwork By	GEL
Dates	05/10/17 to 06/10/17
Log	NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING
		Engineer	
Ground Level	106.70 m.A.O.D.	Coordinates	393338 m.E. 309097 m.N.

Drilling Methods: ROTARY
DYNAMIC SAMPLING WITH ROTARY FOLLOW ON.
CASED 168mm DIAMETER GROUND LEVEL TO 2.50m
OPEN HOLE 146mm DIAMETER 2.50 TO 20.30m

Hole No. **BH116**
Sheet 1 of 5
Job No **14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST/FIELD RECORDS										OTHER TESTS AND NOTES
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Core Run	TCR %	SCR %	RQD %	FI	Type & No	Blows	W %		
				Topsoil (Dark brown slightly gravelly silty/very silty sand. Gravel is rounded-subrounded fine-coarse sandstone and occasional quartzite)		106.30	0.40											Hand excavated from ground level to 1.20m
				Red/brown silty fine-medium SAND with rare gravel. Gravel is subangular-subrounded medium sandstone (Glaciofluvial Deposits)		106.00	0.70	0.60						D1				Organic content and Particle size distribution
				Red/brown occasional yellow/brown silty fine-medium SAND with some medium-coarse gravel size pockets of red/brown silty clay (Glaciofluvial Deposits)				1.00						D2				Particle size distribution and sedimentation
								1.20-2.50						X3				Percussive sampling from 1.20 to 2.50m (128mm diameter). Unable to penetrate beyond 2.50m
				Red/brown silty/very silty fine occasionally medium SAND (Wildmoor Sandstone Formation)		105.40	1.30											
				Extremely weak to weak red/brown fine-medium SANDSTONE. Fractures horizontal/subhorizontal very closely spaced, planar, rough (Wildmoor Sandstone Formation)		104.20	2.50	2.50-4.00						C4				Rotary used 2.50 to 20.30m (146mm diameter), water flush If (2.5-4.0m): NI/15/30
										90	50	0						
10/10/17	2.50	1.50																
11/10/17	2.50	3.50 N						4.00-5.50						C5				If (4.0-6.5m): NI/75/150
				Very weak/weak red/brown occasionally yellow/light brown fine-medium occasionally coarse SANDSTONE. Fractures are horizontal occasionally subhorizontal very close/closely spaced, planar, rough (Wildmoor Sandstone Formation)		102.40	4.30											
										87	65	18						
						101.70	5.00											

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min

WATER
- ▼ 1 First Strike
- ▽ 2 Subsequent Strike
- N - Overnight Depth
- C- Completion Depth
- S Seepage not rising

SAMPLE KEY
- TCR Total Core Recovery
- SCR Solid Core Recovery
- RQD Rock Quality Designation
- FI Fracture Index

TEST KEY
- S Standard penetration test
- C Cone penetration test
- K Permeability test

BLOWS
- N = N value
- 26/150 blows, for 150mm, drive after seating
- 26*, blows for part or whole of seating drive only

Fieldwork By: GEL
Dates: 10/10/17 to 11/10/17
Log: NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Drilling Methods	ROTARY DYNAMIC SAMPLING WITH ROTARY FOLLOW ON. CASED 168mm DIAMETER GROUND LEVEL TO 2.50m OPEN HOLE 146mm DIAMETER 2.50 TO 20.30m	Hole No.	**BH116**
		Engineer				Sheet	2 of 5
Ground Level	106.70 m.A.O.D.	Coordinates	393338 m.E. 309097 m.N.			Job No	**14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST/FIELD RECORDS										OTHER TESTS AND NOTES
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Core Run	TCR %	SCR %	RQD %	FI	Type & No	Blows	W %		
				Extremely/very weak red/brown occasionally yellow/ light brown fine-medium occasionally coarse SANDSTONE. Fractures are horizontal occasionally subhorizontal very close/closely spaced, planar, rough (Wildmoor Sandstone Formation)				5.50-7.00						C6				
								5.90						D3				Point load test
										100	79	35						
																		If (6.5-9.8m): NI/160/260
						99.70	7.00	7.00-8.30						C7				
				Extremely/very weak dark red/brown locally yellow/ brown fine-medium SANDSTONE. Fractures are horizontal and subhorizontal closely occasionally medium spaced, planar, rough (Wildmoor Sandstone Formation)						100	100	100						
								8.30-9.80						C8				
				- yellow/brown between 9.20 and 9.40m						100	90	72						
								9.60						D4				Point load test
								9.80-11.30						C9				If (9.8-16.9m): NI/200/450
						96.70	10.00											

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after			
		5min	10 min	15 min	20 min

WATER
- ▼ 1 First Strike
- ▽ 2 Subsequent Strike
- N - Overnight Depth
- C- Completion Depth
- S Seepage not rising

SAMPLE KEY
- TCR Total Core Recovery
- SCR Solid Core Recovery
- RQD Rock Quality Designation
- FI Fracture Index

TEST KEY
- S Standard penetration test
- C Cone penetration test
- K Permeability test

BLOWS
- N = N value
- 26/150 blows, for 150mm, drive after seating
- 26*, blows for part or whole of seating drive only

Fieldwork By	GEL
Dates	10/10/17 to 11/10/17
Log	NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Drilling Methods	ROTARY DYNAMIC SAMPLING WITH ROTARY FOLLOW ON. CASED 168mm DIAMETER GROUND LEVEL TO 2.50m OPEN HOLE 146mm DIAMETER 2.50 TO 20.30m	Hole No.	**BH116**
		Engineer				Sheet	3 of 5
Ground Level	106.70 m.A.O.D.	Coordinates	393338 m.E. 309097 m.N.			Job No	**14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST/FIELD RECORDS										OTHER TESTS AND NOTES
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Core Run	TCR %	SCR %	RQD %	FI	Type & No	Blows	W %		
				Very weak/weak dark red/brown locally yellow/brown fine-medium SANDSTONE. Fractures are horizontal and subhorizontal, closely occasionally medium spaced, planar, rough (Wildmoor Sandstone Formation)						100	90	85						
				- locally yellow/brown between 11.00 and 11.10m - localised coarse SANDSTONE at 11.20m				11.30-12.80						C10				
										100	88	79						
								12.30-12.80						D5				Unconfined compressive strength
								12.80-14.30						C11				
										100	87	80						
								14.30-15.80						C12				
						91.70	15.00			100	100	81						

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after			
		5min	10 min	15 min	20 min

WATER
- ▼ 1 First Strike
- ▽ 2 Subsequent Strike
- N - Overnight Depth
- C- Completion Depth
- S Seepage not rising

SAMPLE KEY
- TCR Total Core Recovery
- SCR Solid Core Recovery
- RQD Rock Quality Designation
- FI Fracture Index

TEST KEY
- S Standard penetration test
- C Cone penetration test
- K Permeability test

BLOWS
- N = N value
- 26/150 blows, for 150mm, drive after seating
- 26*, blows for part or whole of seating drive only

Fieldwork By	GEL
Dates	10/10/17 to 11/10/17
Log	NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Drilling Methods	ROTARY DYNAMIC SAMPLING WITH ROTARY FOLLOW ON. CASED 168mm DIAMETER GROUND LEVEL TO 2.50m OPEN HOLE 146mm DIAMETER 2.50 TO 20.30m	Hole No.	**BH116**
		Engineer				Sheet	4 of 5
Ground Level	106.70 m.A.O.D.	Coordinates	393338 m.E. 309097 m.N.			Job No	**14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST/FIELD RECORDS										OTHER TESTS AND NOTES
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Core Run	TCR %	SCR %	RQD %	FI	Type & No	Blows	W %		
				Very weak/weak dark red/brown locally yellow/brown fine-medium SANDSTONE. Fractures are horizontal and subhorizontal, closely occasionally medium spaced, planar, rough (Wildmoor Sandstone Formation)				15.50						D6				Point load test
								15.80-17.30						C13				
										100	96	77						
						89.80	16.90											If (16.9-18.4m) NI/180/260
				Very weak/weak medium-coarse SANDSTONE with subrounded fine-medium quartzite gravel. Fractures are closely spaced subhorizontal, planar, rough (Wildmoor Sandstone Formation)				17.10						D7				Point load test
								17.30-18.80						C14				
										100	98	91						
						88.30	18.40											If (18.4-20.3m): NI/180/280
				Weak/medium strong dark red/brown fine-medium SANDSTONE. Fractures close to medium spaced subhorizontal, planar, rough (Wildmoor Sandstone Formation) - locally yellow/brown between 18.50 and 18.90m				18.80-20.30						C15				
								19.00-19.30						D8				Unconfined compressive strength
				- 45 degree fracture at 19.40m						100	92	77						
						86.70	20.00											

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min

WATER
- ▼ 1 First Strike
- ▽ 2 Subsequent Strike
- N - Overnight Depth
- C- Completion Depth
- S Seepage not rising

SAMPLE KEY
- TCR Total Core Recovery
- SCR Solid Core Recovery
- RQD Rock Quality Designation
- FI Fracture Index

TEST KEY
- S Standard penetration test
- C Cone penetration test
- K Permeability test

BLOWS
- N = N value
- 26/150 blows, for 150mm, drive after seating
- 26*, blows for part or whole of seating drive only

Fieldwork By	GEL
Dates	10/10/17 to 11/10/17
Log	NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Drilling Methods	ROTARY DYNAMIC SAMPLING WITH ROTARY FOLLOW ON. CASED 168mm DIAMETER GROUND LEVEL TO 2.50m OPEN HOLE 146mm DIAMETER 2.50 TO 20.30m	Hole No.	**BH116**
		Engineer				Sheet	5 of 5
Ground Level	106.70 m.A.O.D.	Coordinates	393338 m.E. 309097 m.N.			Job No	**14317GI2**

WATER			STRATA				SAMPLING/IN SITU TEST/FIELD RECORDS									OTHER TESTS AND NOTES
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Core Run	TCR %	SCR %	RQD %	FI	Type & No	Blows	W %	
11/10/17	2.50			Weak/medium strong dark red/brown fine-medium SANDSTONE. Fractures close to medium spaced subhorizontal, planar, rough (Wildmoor Sandstone Formation) - 30 degree fracture at 20.00m		86.40	20.30	20.30									Borehole complete at 20.30m 50mm diameter HDPE pipe installed to 9.00m Pipework capped and protected with raised lockable cover

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after			
		5min	10 min	15 min	20 min

WATER
- ▼ 1 First Strike
- ▽ 2 Subsequent Strike
- N - Overnight Depth
- C- Completion Depth
- S Seepage not rising

SAMPLE KEY
- TCR Total Core Recovery
- SCR Solid Core Recovery
- RQD Rock Quality Designation
- FI Fracture Index

TEST KEY
- S Standard penetration test
- C Cone penetration test
- K Permeability test

BLOWS
- N = N value
- 26/150 blows, for 150mm, drive after seating
- 26*, blows for part or whole of seating drive only

Fieldwork By	GEL
Dates	10/10/17 to 11/10/17
Log	NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client WALDECK CONSULTING Engineer	Drilling Methods ROTARY DYNAMIC SAMPLING WITH ROTARY FOLLOW ON. CASED 168mm DIAMETER GROUND LEVEL TO 3.80m OPEN HOLE 146mm DIAMETER 3.80 TO 15.30m
Ground Level	104.20 m.A.O.D.	Coordinates 392400 m.E. 308680 m.N.	

Hole No. **BH117**
Sheet 1 of 4
Job No **14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST/FIELD RECORDS										OTHER TESTS AND NOTES
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Core Run	TCR %	SCR %	RQD %	FI	Type & No	Blows	W %		
				Topsoil (Brown/dark brown slightly gravelly silty SAND. Gravel is rounded-subangular fine-medium quartzite, rare brick fragments)														Hand excavated from ground level to 1.10m
				Made Ground (Dark red/brown fine-coarse sand with much subangular-subrounded fine-coarse quartzite and occasional sandstone gravel. Also containing medium-coarse gravel size soft/firm brown silty clay pockets)		103.75	0.45	0.60						D1				
								0.90						D2				
				Made Ground (Soft/firm dark brown and red/brown silty very sandy clay with some subangular-subrounded fine-medium quartzite gravel, rare brick fragments, occasionally black and becoming red/brown with depth. Also containing rare glass fragments)		103.10	1.10	1.20-2.60						X3				Percussive sampling from 1.10 to 3.80m (128mm diameter)
								1.60						D3				BRE SD1 chemical suite
								2.60-3.80						X4				
				Red/brown silty very sandy subangular-subrounded fine-coarse quartzite GRAVEL (Glaciofluvial Deposits)		101.40	2.80	3.00						D4				Particle size distribution
				Red/brown locally yellow/brown clayey silty fine-medium SAND (Wildmoor Sandstone Formation)		101.00	3.20											
				- (inferred from arisings from 3.80m)				3.80-5.00						D5				Particle size distribution and sedimentation
								3.80						C5				Rotary cored 3.80 to 15.30m (146mm diameter), water flush
				Extremely weak red/brown fine-medium SANDSTONE (inferred from arisings) (Wildmoor Sandstone Formation)		100.20	4.00			0	-	-						
						99.20	5.00	5.00-6.20						C6				

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min

WATER
▼ 1 First Strike
▽ 2 Subsequent Strike
N - Overnight Depth
C- Completion Depth
S Seepage not rising

SAMPLE KEY
TCR Total Core Recovery
SCR Solid Core Recovery
RQD Rock Quality Designation
FI Fracture Index

TEST KEY
S Standard penetration test
C Cone penetration test
K Permeability test

BLOWS
N = N value
26/150 blows, for 150mm, drive after seating
26*, blows for part or whole of seating drive only

Fieldwork By GEL
Dates 02/10/17 to 03/10/17
Log NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client WALDECK CONSULTING Engineer	Drilling Methods ROTARY DYNAMIC SAMPLING WITH ROTARY FOLLOW ON. CASED 168mm DIAMETER GROUND LEVEL TO 3.80m OPEN HOLE 146mm DIAMETER 3.80 TO 15.30m
Ground Level	104.20 m.A.O.D.	Coordinates 392400 m.E. 308680 m.N.	

Hole No. **BH117**
Sheet 2 of 4
Job No **14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST/FIELD RECORDS										OTHER TESTS AND NOTES
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Core Run	TCR %	SCR %	RQD %	FI	Type & No	Blows	W %		
				Extremely weak red/brown fine-medium SANDSTONE (inferred from arisings) (Wildmoor Sandstone Formation)						0	-	-						
				Extremely weak red/brown and locally yellow/brown fine-medium SANDSTONE. Fractures are subhorizontal very closely spaced, planar, rough (Limited sample recovery) (Wildmoor Sandstone Formation)		98.00	6.20	6.20-7.40						C7				If (6.2-7.4m): NI/-/-
										21	0	0						
				Extremely/very weak red/brown occasionally yellow/brown fine-medium SANDSTONE. Fractures are horizontal and occasionally subhorizontal, very closely occasionally closely spaced, planar, rough (Wildmoor Sandstone Formation)		96.80	7.40	7.40-8.60						C8				If (7.4-8.6m): NI/10/30
										63	25	0						
								8.60-10.00						C9				If (8.6-10.0m): NI/50/90
										86	34	7						
								9.70						D6				Point load test
02/10/17	3.80	1.90																
03/10/17	3.80	2.40 N				94.20	10.00	10.00-11.00						C10				

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min

WATER
▼ 1 First Strike
▽ 2 Subsequent Strike
N - Overnight Depth
C- Completion Depth
S Seepage not rising

SAMPLE KEY
TCR Total Core Recovery
SCR Solid Core Recovery
RQD Rock Quality Designation
FI Fracture Index

TEST KEY
S Standard penetration test
C Cone penetration test
K Permeability test

BLOWS
N = N value
26/150 blows, for 150mm, drive after seating
26*, blows for part or whole of seating drive only

Fieldwork By GEL
Dates 02/10/17 to 03/10/17
Log NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Drilling Methods	ROTARY DYNAMIC SAMPLING WITH ROTARY FOLLOW ON. CASED 168mm DIAMETER GROUND LEVEL TO 3.80m OPEN HOLE 146mm DIAMETER 3.80 TO 15.30m	Hole No.	**BH117**
		Engineer				Sheet	3 of 4
Ground Level	104.20 m.A.O.D.	Coordinates	392400 m.E. 308680 m.N.			Job No	**14317GI2**

WATER			STRATA				SAMPLING/IN SITU TEST/FIELD RECORDS										OTHER TESTS AND NOTES
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Core Run	TCR %	SCR %	RQD %	FI	Type & No	Blows	W %	
				Very weak/weak occasionally extremely weak red/ brown occasionally yellow/brown fine-medium SANDSTONE. Fractures are horizontal/ subhorizontal occasionally 45-60 degrees, planar, rough (Wildmoor Sandstone Formation)						90	58	40					If (10.0-15.3m): NI/100/180
								10.90						D7			Point load test
								11.00-12.30						C11			
										65	46	0					
								12.30-13.30						C12			
				- single 45 degree fracture at 12.60m													
										80	63	12					
								13.30-14.30						C13			
										90	65	48					
								14.00						D8			Point load test
				- single subvertical fracture													
								14.30-15.30						C14			
								14.50						D9			Point load test
										100	80	41					
						89.20	15.00										

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min

WATER
- ▼ 1 First Strike
- ▽ 2 Subsequent Strike
- N - Overnight Depth
- C- Completion Depth
- S Seepage not rising

SAMPLE KEY
- TCR Total Core Recovery
- SCR Solid Core Recovery
- RQD Rock Quality Designation
- FI Fracture Index

TEST KEY
- S Standard penetration test
- C Cone penetration test
- K Permeability test

BLOWS
- N = N value
- 26/150 blows, for 150mm, drive after seating
- 26*, blows for part or whole of seating drive only

Fieldwork By	GEL
Dates	02/10/17 to 03/10/17
Log	NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Drilling Methods	ROTARY DYNAMIC SAMPLING WITH ROTARY FOLLOW ON. CASED 168mm DIAMETER GROUND LEVEL TO 3.80m OPEN HOLE 146mm DIAMETER 3.80 TO 15.30m	Hole No.	**BH117**
		Engineer				Sheet	4 of 4
Ground Level	104.20 m.A.O.D.	Coordinates	392400 m.E. 308680 m.N.			Job No	**14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST/FIELD RECORDS										OTHER TESTS AND NOTES
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Core Run	TCR %	SCR %	RQD %	FI	Type & No	Blows	W %		
03/10/17	3.80	2.40 C		Very weak/weak red/brown occasionally yellow/brown fine-medium SANDSTONE. Fractures are horizontal/ subhorizontal occasionally 45-60 degrees, planar, rough (Wildmoor Sandstone Formation)		88.90	15.30	15.30										Borehole complete at 15.30m 50mm diameter HDPE pipe installed to 8.80m Pipework capped and protected with flush lockable cover

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min

WATER
- ▼ 1 First Strike
- ▽ 2 Subsequent Strike
- N - Overnight Depth
- C- Completion Depth
- S Seepage not rising

SAMPLE KEY
- TCR Total Core Recovery
- SCR Solid Core Recovery
- RQD Rock Quality Designation
- FI Fracture Index

TEST KEY
- S Standard penetration test
- C Cone penetration test
- K Permeability test

BLOWS
- N = N value
- 26/150 blows, for 150mm, drive after seating
- 26*, blows for part or whole of seating drive only

Fieldwork By	GEL
Dates	02/10/17 to 03/10/17
Log	NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Drilling Methods	ROTARY DYNAMIC SAMPLING WITH ROTARY FOLLOW ON.	Hole No.	**BH118**
		Engineer				Sheet	1 of 1
Ground Level	105.50 m.A.O.D.	Coordinates	392888 m.E. 308746 m.N.			Job No	**14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST/FIELD RECORDS									
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Core Run	TCR %	SCR %	RQD %	FI	Type & No	Blows	W %	OTHER TESTS AND NOTES
				Topsoil (Brown silty sand with some subrounded fine-medium quartzite and sandstone gravel)		105.15	0.35										Hand excavated from ground level to 0.80m
				Made Ground (Dark brown and red/brown occasionally black slightly clayey silty sand with some rounded-angular fine-coarse sandstone gravel, medium-coarse gravel size brick fragment and coarse gravel size/cobbles of road materials) - block of concrete with steel reinforcement beween 0.70 and 0.80m		104.70	0.80	0.60						D1			Unable to progress through reinforced concrete in the made ground at 0.80m

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min

WATER
- ▼ 1 First Strike
- ▽ 2 Subsequent Strike
- N - Overnight Depth
- C- Completion Depth
- S Seepage not rising

SAMPLE KEY
- TCR Total Core Recovery
- SCR Solid Core Recovery
- RQD Rock Quality Designation
- FI Fracture Index

TEST KEY
- S Standard penetration test
- C Cone penetration test
- K Permeability test

BLOWS
- N = N value
- 26/150 blows, for 150mm, drive after seating
- 26*, blows for part or whole of seating drive only

Fieldwork By	GEL
Dates	03/10/17
Log	NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Drilling Methods	ROTARY DYNAMIC SAMPLING WITH ROTARY FOLLOW ON. CASED 168mm DIAMETER GROUND LEVEL TO 5.10m OPEN HOLE 146mm DIAMETER 5.10 TO 15.60m	Hole No.	**BH118A**
		Engineer				Sheet	1 of 4
Ground Level	105.50 m.A.O.D.	Coordinates	392888 m.E. 308747 m.N.			Job No	**14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST/FIELD RECORDS										OTHER TESTS AND NOTES
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Core Run	TCR %	SCR %	RQD %	FI	Type & No	Blows	W %		
				Topsoil (Brown silty sand with some subrounded fine-medium quartzite and sandstone gravel)														Hand excavated from ground level to 1.10m
						105.15	0.35											
				Made Ground (Red/brown, dark brown slightly sandy clay with subangular-subrounded fine-medium sandstone gravel)				0.60						D1				BRE SD1 chemical suite
03/10/17		DRY																
04/10/17		DRY N						1.10-2.60						X2				Percussive sampling from 1.10 to 5.10m (128mm diameter)
				- single rounded coarse gravel size quartzite at 1.20m														
				- light brown from 1.20 to 1.35m														
						104.15	1.35											
				Stiff high strength red/brown and occasionally mottled red/grey silty CLAY with a little subangular fine-medium quartzite and sandstone gravel (Till)														Hand shear vane at 1.70m = 114kPa Hand shear vane at 1.90m = 96kPa
								2.00						D2		15.2		
																		Hand shear vane at 2.20m = 95kPa
						102.90	2.60	2.60-4.10						X3				
				Brown/orange silty very sandy rounded-subangular fine-coarse quartzite and occasional sandstone GRAVEL (Glaciofluvial Deposits)				2.80						D3				Particle size distribution
						102.00	3.50											
				Red/brown silty fine-medium SAND, occasionally locally yellow brown (Wildmoor Sandstone Formation)				4.00						D4				Particle size distribution
								4.10-5.10						X4				
						100.50	5.00											Unable to progress by percussive sampling beyond 5.10m

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min

WATER
- ▼ 1 First Strike
- ▽ 2 Subsequent Strike
- N - Overnight Depth
- C- Completion Depth
- S Seepage not rising

SAMPLE KEY
- TCR Total Core Recovery
- SCR Solid Core Recovery
- RQD Rock Quality Designation
- FI Fracture Index

TEST KEY
- S Standard penetration test
- C Cone penetration test
- K Permeability test

BLOWS
- N = N value
- 26/150 blows, for 150mm, drive after seating
- 26*, blows for part or whole of seating drive only

Fieldwork By	GEL
Dates	03/10/17 to 04/10/17
Log	NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client WALDECK CONSULTING Engineer	Drilling Methods ROTARY DYNAMIC SAMPLING WITH ROTARY FOLLOW ON. CASED 168mm DIAMETER GROUND LEVEL TO 5.10m OPEN HOLE 146mm DIAMETER 5.10 TO 15.60m
Ground Level	105.50 m.A.O.D.	Coordinates 392888 m.E. 308747 m.N.	Hole No. **BH118A** Sheet 2 of 4 Job No **14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST/FIELD RECORDS										OTHER TESTS AND NOTES
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Core Run	TCR %	SCR %	RQD %	FI	Type & No	Blows	W %		
				Red/brown silty fine-medium SAND, occasionally locally yellow brown (Wildmoor Sandstone Formation)		100.40	5.10	5.10-6.60						C5				Rotary cored 5.10 to 15.60m (146mm diameter), water flush
				Red/brown and grey/brown brown fine SAND and subangular fine-medium gravel size fragments of extremely weak cemented sandstone (Wildmoor Sandstone Formation)						100	23	0						If (5.1-6.6m): NI/-/-
				Extremely weak red/brown occasionally orange/brown fine-medium SANDSTONE. Fractures horizontal/ subhorizontal extremely/very closely spaced, planar, rough (Wildmoor Sandstone Formation)		99.40	6.10	6.60-8.10						C6				If (6.6-10.3m): NI/60/180
										100	73	30						
								8.10-9.60						C7				
				- with some subvertical fracturing between 8.70 and 9.10m						100	60	13						
				- very weak at 9.60m				9.60-11.10						C8				
						95.50	10.00											

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min

WATER
- ▼ 1 First Strike
- ▽ 2 Subsequent Strike
- N - Overnight Depth
- C- Completion Depth
- S Seepage not rising

SAMPLE KEY
- TCR Total Core Recovery
- SCR Solid Core Recovery
- RQD Rock Quality Designation
- FI Fracture Index

TEST KEY
- S Standard penetration test
- C Cone penetration test
- K Permeability test

BLOWS
- N = N value
- 26/150 blows, for 150mm, drive after seating
- 26*, blows for part or whole of seating drive only

Fieldwork By	GEL
Dates	03/10/17 to 04/10/17
Log	NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Drilling Methods	ROTARY DYNAMIC SAMPLING WITH ROTARY FOLLOW ON. CASED 168mm DIAMETER GROUND LEVEL TO 5.10m OPEN HOLE 146mm DIAMETER 5.10 TO 15.60m	Hole No.	**BH118A**
		Engineer				Sheet	3 of 4
Ground Level	105.50 m.A.O.D.	Coordinates	392888 m.E. 308747 m.N.			Job No	**14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST/FIELD RECORDS										OTHER TESTS AND NOTES
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Core Run	TCR %	SCR %	RQD %	FI	Type & No	Blows	W %		
				Extremely weak red/brown occasionally orange/brown fine-medium SANDSTONE. Fractures horizontal/ subhorizontal extremely/very closely spaced, planar, rough (Wildmoor Sandstone Formation)		95.20	10.30			100	90	70						If (10.3-11.5m): NI/140/190
				Extremely/very weak red/brown locally yellow/brown fine-medium SANDSTONE. Fractures are generally horizontal occasionally subhorizontal very closely/closely spaced, planar, rough (Wildmoor Sandstone Formation)				10.70						D5				Point load test
								11.10-12.60						C9				
																		If (11.5-12.6m): NI/120/150
										100	92	32						
				- becoming weak at 12.00m														
				Very weak/weak red/brown locally yellow/brown fine-medium SANDSTONE. Fractures are horizontal and subhorizontal very closely/closely occasionally medium spaced, planar, rough (Wildmoor Sandstone Formation)		93.40	12.10											
								12.50						D6				Point load test
								12.60-14.10						C10				If (12.6-15.6m): NI/200/290
								13.10-13.40						D7				Point load test
										100	94	65						
								14.10-15.60						C11				
				- fragmented core at 14.60m														
										100	92	75						
						90.50	15.00											

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min

WATER
- ▼ 1 First Strike
- ▽ 2 Subsequent Strike
- N - Overnight Depth
- C- Completion Depth
- S Seepage not rising

SAMPLE KEY
- TCR Total Core Recovery
- SCR Solid Core Recovery
- RQD Rock Quality Designation
- FI Fracture Index

TEST KEY
- S Standard penetration test
- C Cone penetration test
- K Permeability test

BLOWS
- N = N value
- 26/150 blows, for 150mm, drive after seating
- 26*, blows for part or whole of seating drive only

Fieldwork By	GEL
Dates	03/10/17 to 04/10/17
Log	NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Drilling Methods	ROTARY DYNAMIC SAMPLING WITH ROTARY FOLLOW ON. CASED 168mm DIAMETER GROUND LEVEL TO 5.10m OPEN HOLE 146mm DIAMETER 5.10 TO 15.60m	Hole No.	**BH118A**
		Engineer				Sheet	4 of 4
Ground Level	105.50 m.A.O.D.	Coordinates	392888 m.E. 308747 m.N.			Job No	**14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST/FIELD RECORDS										OTHER TESTS AND NOTES
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Core Run	TCR %	SCR %	RQD %	FI	Type & No	Blows	W %		
				Weak red/brown locally yellow/brown fine-medium SANDSTONE. Fractures are horizontal and subhorizontal very closely/closely occasional medium spaced, planar, rough (Wildmoor Sandstone Formation)				15.10-15.40						D8				Point load test
04/10/17	5.10	2.10 C		- retrieved as subangular medium gravel between 15.30 and 15.35m		89.90	15.60	15.60										Borehole complete at 15.60m 50mm diameter HDPE pipe installed to 9.50m Pipework capped and protected with flush lockable cover

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after			
		5min	10 min	15 min	20 min

WATER
- ▼ 1 First Strike
- ▽ 2 Subsequent Strike
- N - Overnight Depth
- C- Completion Depth
- S Seepage not rising

SAMPLE KEY
- TCR Total Core Recovery
- SCR Solid Core Recovery
- RQD Rock Quality Designation
- FI Fracture Index

TEST KEY
- S Standard penetration test
- C Cone penetration test
- K Permeability test

BLOWS
- N = N value
- 26/150 blows, for 150mm, drive after seating
- 26*, blows for part or whole of seating drive only

Fieldwork By	GEL
Dates	03/10/17 to 04/10/17
Log	NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Boring Methods	LIGHT CABLE PERCUSSION 150 mm DIAMETER CASED 150 mm DIAMETER G.L. TO 8.00 m	Hole No.	**BH225**
		Engineer				Sheet	1 of 1
Ground Level	108.00 m.A.O.D.	Coordinates	393073 m.E. 309374 m.N.			Job No	**14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST			LAB TESTING							
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst.	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Type & No.	Blows/ Strength	% < 425	w %	w_P %	w_L %	ρ Mg/m^3	c_u kN/m^2	OTHER TESTS AND NOTES
				Topsoil (Gravelly topsoil) [Driller's description]													Hand excavated from ground level to 1.20m
				Hard red brown and brown silty sandy gravelly CLAY with occasional rootlets. Gravel composed of rounded-subrounded fine-medium quartzite (Till)		107.54 107.30	0.46 0.70	0.50	D1		95	10.5	15	28			
								1.00	D2								
								1.10-1.55	C1	N=28							Particle size distribution and sedimentation
				Medium dense silty clayey fine-coarse SAND with much subrounded fine-coarse quartzite gravel (Glaciofluvial Deposits)		106.60 106.40	1.40 1.60	1.10-1.40 1.50	B1 D3		61	7.3		19			
				Stiff red brown silty very sandy CLAY with occasional subrounded fine-coarse quartzite gravel (Till)				2.00	D4								BRE SD1 chemical suite
								2.10-2.55	C2	N=19							Shear box test (60mm)
								2.10-2.40	B2								
				Medium dense red brown slightly clayey silty fine-coarse SAND and subrounded fine-coarse quartzite and occasional sandstone GRAVEL (Glaciofluvial Deposits)				2.50	D5								
								3.00	D6								
				Dense red brown slightly clayey silty fine-coarse SAND with occasional fine-coarse gravel size weakly cemented sandstone fragments (Wildmoor Sandstone Formation)		104.90	3.10	3.10-3.55	C3	N=36							Particle size distribution
								3.20-3.50	B3								
								3.50	D7								BRE SD1 chemical suite
				- becoming very dense from approximately 4.00m				4.00-4.40	C4	50/250							Chisel in use between 4.00 and 8.00m
								4.00	D8								
								4.10-4.40	B4								
								4.50	D9								
								5.00	D10								
								5.10-5.40	C5	50/150							
								5.20-5.50	B5								
18/09/17	6.00	(1) ▼						6.00	D11								Groundwater seepage recorded at 6.30m, fast inflow, rose to 5.30m after 20 minutes
								6.40-6.55	C6	50*							
								6.50-6.80	B6								
				- becoming more cemented with depth				7.00	D12								
18/09/17	8.00	5.30 C						8.00-8.15	C7	50*							
						99.85	8.15										Borehole complete at 8.15m

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min
(1)	6.30	5.60	5.30	5.30	5.30

WATER
▼ 1 First Strike
▽ 2 Subsequent Strike
N - Overnight Depth
C- Completion Depth
S Seepage not rising

SAMPLE KEY
D Small disturbed sample
B Bulk disturbed sample
W Water sample
U Undisturbed sample
P Piston sample

TEST KEY
S Standard penetration test
C Cone penetration test
K Permeability test
V In situ vane test

BLOWS / STRENGTH
N= N value
26/150 blows, for 150mm, drive after seating
26*, blows for part or whole of seating drive only
(26) U sample blow count
V = Vane Strength - kN/m^2

Fieldwork By	JH
Dates	18/09/17
Log	JMK

RSA GEOTECHNICS LTD

Project: WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client: WALDECK CONSULTING Engineer:	Boring Methods: LIGHT CABLE PERCUSSION 150 mm DIAMETER CASED 150 mm DIAMETER G.L. TO 8.00 m	Hole No. **BH226** Sheet 1 of 1 Job No **14317GI2**
Ground Level: 107.20 m.A.O.D.	Coordinates: 393121 m.E. 309107 m.N.		

WATER				STRATA				SAMPLING/IN SITU TEST			LAB TESTING							
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst.	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Type & No.	Blows/ Strength	% < 425	w %	w_P %	w_L %	q Mg/m^3	c_u kN/m^2	OTHER TESTS AND NOTES
				Topsoil (Dark brown silty fine-medium sand with occasional subrounded fine-medium quartzite gravel and rare rootlets)		106.60	0.60	0.50	D1								Hand excavated from ground level to 1.20m
				Medium dense red brown clayey silty fine-coarse SAND with a little subrounded fine-medium quartzite gravel and fine-coarse gravel size weakly cemented sandstone fragments (Glaciofluvial Deposits)				1.00	D2								
								1.20-1.65	C1	N=24							Particle size distribution and sedimentation
								1.20-1.50	B1								BRE SD1 chemical suite
								1.50	D3								
								2.00-2.40	C2	50/250							
						105.00	2.20	2.00	D4								Particle size distribution and sedimentation
				Very dense red brown and occasional light grey silty clayey fine-medium SAND with occasional fine-coarse gravel size weakly cemented sandstone fragments (Wildmoor Sandstone Formation)				2.10-2.40	B2								Chisel in use between 2.20 and 8.00m
								2.50	D5								
								3.00-3.20	C3	50/50							
								3.00	D6								
								3.00-3.30	B3								
								3.50	D7								
								4.00	D8								
								4.00-4.30	B4								
		(1)						4.50	D9								
15/09/17	4.50	▼															Groundwater seepage recorded at 4.90m, fast inflow, rose to 3.80m after 20 minutes
								5.00-5.15	C4	50*							
								5.00	D10								
								5.10-5.40	B5								
								6.00	D11								
								6.50-6.60	C5	50*							
								6.50-6.80	B6								
								7.00	D12								
15/09/17	8.00	3.80 C						8.00-8.05	C6	50*							
						99.15	8.05										Borehole complete at 8.05m
																	50mm diameter HDPE pipe installed to 8.00m
																	Pipework capped and protected with raised lockable cover

Water Level observations during boring, depths below GL.

Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min
(1)	4.90	4.20	3.80	3.80	3.80

WATER
▼ 1 First Strike
▽ 2 Subsequent Strike
N - Overnight Depth
C- Completion Depth
S Seepage not rising

SAMPLE KEY
D Small disturbed sample
B Bulk disturbed sample
W Water sample
U Undisturbed sample
P Piston sample

TEST KEY
S Standard penetration test
C Cone penetration test
K Permeability test
V In situ vane test

BLOWS / STRENGTH
N= N value
26/150 blows, for 150mm, drive after seating
26*, blows for part or whole of seating drive only
(26) U sample blow count
V = Vane Strength - kN/m^2

Fieldwork By	JH
Dates	15/09/17
Log	JMK

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Boring Methods	LIGHT CABLE PERCUSSION 150 mm DIAMETER CASED 150 mm DIAMETER G.L. TO 6.00 m	Hole No.	**BH227**
		Engineer				Sheet	1 of 1
Ground Level	108.30 m.A.O.D.	Coordinates	393352 m.E. 309272 m.N.			Job No	**14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST			LAB TESTING							
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst.	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Type & No.	Blows/ Strength	% < 425	w %	w_P %	w_L %	ρ Mg/m^3	c_u kN/m^2	OTHER TESTS AND NOTES
				Topsoil (Dark brown silty gravelly fine-medium sand with occasional rootlets. Gravel composed of rounded-subrounded fine-medium quartzite)				0.50	D1								Hand excavated from ground level to 1.20m
						107.55	0.75										
				Medium dense dark red brown silty clayey fine-coarse SAND with a little subangular-subrounded fine-coarse quartzite gravel (Glaciofluvial Deposits)				1.00-1.45	C1	N=14							BRE SD1 chemical suite
								1.00	D2								
						106.90	1.40	1.30-1.60	B1								Particle size distribution and sedimentation
								1.50	D3								
				Medium dense red brown silty clayey fine-medium SAND with occasional fine-coarse gravel size weakly cemented sandstone fragments (Wildmoor Sandstone Formation)				2.00-2.45	C2	N=25							
								2.00	D4								
								2.00-2.30	B2								
								2.50	D5								
								3.00	D6								
								3.10-3.55	C3	N=18							Particle size distribution and sedimentation
								3.20-3.50	B3								
11/09/17	3.50	(1) ▼						3.50	D7								Groundwater seepage recorded at 3.90m, fast inflow, rose to 3.70m after 20 minutes
								4.00	D8								
				Very dense red brown and occasional yellow brown silty fine-coarse SAND with occasional fine-coarse gravel size weakly cemented sandstone fragments (Wildmoor Sandstone Formation)		104.20	4.10	4.10-4.50	C4	50/250							
								4.20-4.50	B4								
								4.50	D9								Chisel in use between 4.10 and 6.00m
								5.00	D10								
								5.20-5.55	C5	50/200							
								5.30-5.60	B5								
								5.50	D11								
11/09/17	6.00	3.70 C						6.00-6.15	C6	50*							
						102.15	6.15										Borehole complete at 6.15m

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min
(1)	3.90	3.70			

WATER
▼ 1 First Strike
▽ 2 Subsequent Strike
N - Overnight Depth
C- Completion Depth
S Seepage not rising

SAMPLE KEY
D Small disturbed sample
B Bulk disturbed sample
W Water sample
U Undisturbed sample
P Piston sample

TEST KEY
S Standard penetration test
C Cone penetration test
K Permeability test
V In situ vane test

BLOWS / STRENGTH
N= N value
26/150 blows, for 150mm, drive after seating
26*, blows for part or whole of seating drive only
(26) U sample blow count
V = Vane Strength - kN/m^2

Fieldwork By	JH
Dates	11/09/17
Log	JMK

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Boring Methods	LIGHT CABLE PERCUSSION 150 mm DIAMETER CASED 150 mm DIAMETER G.L. TO 5.00 m	Hole No.	**BH228**
		Engineer				Sheet	1 of 1
Ground Level	107.00 m.A.O.D.	Coordinates	393170 m.E. 309044 m.N.			Job No	**14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST			LAB TESTING							
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst.	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Type & No.	Blows/ Strength	% < 425	w %	w_P %	w_L %	ρ Mg/m^3	c_u kN/m^2	OTHER TESTS AND NOTES
				Topsoil [Driller's description]													Hand excavated from ground level to 1.20m
				Red brown and light brown silty fine-medium SAND (Glaciofluvial Deposits)		106.50	0.50	0.50	D1								
				Dense red brown and occasional yellow brown silty clayey fine-medium SAND with occasional fine-medium gravel size weakly cemented sandstone fragments (Wildmoor Sandstone Formation)		106.00	1.00	1.00-1.45	C1	N=42							BRE SD1 chemical suite
								1.00	D2								Particle size distribution and sedimentation
								1.10-1.40	B1								
				- becoming very dense from approximately 2.10m				2.00	D3								
								2.10-2.35	C2	50/100							Chisel in use between 2.10 and 5.00m
								2.20-2.50	B2								
								2.50	D4								
								3.00-3.25	C3	50/100							
								3.00	D5								
								3.10-3.40	B3								
								3.50	D6								
12/09/17	4.00	(1) ▼						4.00	D7								Groundwater seepage recorded at 4.00m, fast inflow, rose to 3.50m after 20 minutes
				- becoming cemented with depth				4.10-4.30	C4	50/50							
								4.20-4.50	B4								
								4.50	D8								
12/09/17	5.00	3.50 C						5.00-5.15	C5	50*							
						101.85	5.15	5.00	D9								Borehole complete at 5.15m

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min
(1)	4.00	3.80			

WATER
▼ 1 First Strike
▽ 2 Subsequent Strike
N - Overnight Depth
C- Completion Depth
S Seepage not rising

SAMPLE KEY
D Small disturbed sample
B Bulk disturbed sample
W Water sample
U Undisturbed sample
P Piston sample

TEST KEY
S Standard penetration test
C Cone penetration test
K Permeability test
V In situ vane test

BLOWS / STRENGTH
N= N value
26/150 blows, for 150mm, drive after seating
26*, blows for part or whole of seating drive only
(26) U sample blow count
V = Vane Strength - kN/m^2

Fieldwork By	JH
Dates	12/09/17
Log	JMK

RSA GEOTECHNICS LTD

Project: WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client: WALDECK CONSULTING Engineer:	Boring Methods: LIGHT CABLE PERCUSSION 150 mm DIAMETER CASED 150 mm DIAMETER G.L. TO 8.20 m	Hole No. **BH229** Sheet 1 of 1 Job No **14317GI2**
Ground Level: 106.80 m.A.O.D.	Coordinates: 392690 m.E. 308928 m.N.		

WATER				STRATA				SAMPLING/IN SITU TEST			LAB TESTING							
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst.	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Type & No.	Blows/ Strength	% < 425	w %	w_P %	w_L %	ρ Mg/m^3	c_u kN/m^2	OTHER TESTS AND NOTES
				Topsoil (Gravelly topsoil) [Driller's description]		106.40	0.40										Hand excavated from ground level to 1.20m
				Made Ground (Red brown and grey brown slightly clayey silty gravelly fine-coarse sand with occasional fine-medium gravel size ash fragments and rootlets)				0.50	D1								
								1.00	D2								BRE SD1 chemical suite
								1.20-1.65	C1	N=21							
				Made Ground (Firm grey and dark grey sandy silty gravelly clay with occasional fine-medium gravel size ash fragments)		105.50	1.30	1.20-1.50	B1								
								1.50	D3								BRE SD1 chemical suite
								2.00	D4								
				Dense grey brown clayey silty fine-coarse SAND with much subrounded fine-coarse quartzite and sandstone gravel (Glaciofluvial Deposits)		104.70	2.10	2.10-2.55	C2	N=32							Particle size distribution
								2.20-2.50	B2								
								2.50	D5								BRE SD1 chemical suite
								3.00	D6								
								3.10-3.55	C3	N=33							
				Very dense red brown clayey silty fine-medium SAND with rare fine-coarse gravel size weakly cemented sandstone fragments (Wildmoor Sandstone Formation)		103.40	3.40	3.20-3.50	B3								
								4.00	D7								Particle size distribution and sedimentation
								4.10-4.40	C4	50/150							Chisel in use between 4.10 and 8.20m
								4.20-4.50	B4								
								4.50	D8								
20/09/17	4.50	(1) ▼						5.00-5.20	C5	50/50							Groundwater seepage recorded at 5.10m, fast inflow, no rise
								5.00	D9								
								5.20-5.50	B5								
				- becoming increasingly cemented with depth				6.00	D10								
								6.60-6.80	C6	50/50							
								6.70-7.00	B6								
								7.00	D11								
20/09/17	8.20	5.10 C				98.50	8.30	8.20-8.30	C7	50*							Borehole complete at 8.30m
																	50mm diameter HDPE pipe installed to 8.20m
																	Pipework capped and protected with raised lockable cover

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min
(1)	5.10	5.00			

WATER
▼ 1 First Strike
▽ 2 Subsequent Strike
N - Overnight Depth
C- Completion Depth
S Seepage not rising

SAMPLE KEY
D Small disturbed sample
B Bulk disturbed sample
W Water sample
U Undisturbed sample
P Piston sample

TEST KEY
S Standard penetration test
C Cone penetration test
K Permeability test
V In situ vane test

BLOWS / STRENGTH
N= N value
26/150 blows, for 150mm, drive after seating
26*, blows for part or whole of seating drive only
(26) U sample blow count
V = Vane Strength - kN/m^2

Fieldwork By	JH
Dates	20/09/17
Log	JMK

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Boring Methods	LIGHT CABLE PERCUSSION 150 mm DIAMETER CASED 150 mm DIAMETER G.L. TO 9.20 m	Hole No.	**BH230**
		Engineer				Sheet	1 of 1
Ground Level	107.40 m.A.O.D.	Coordinates	392830 m.E. 309030 m.N.			Job No	**14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST			LAB TESTING							
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst.	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Type & No.	Blows/ Strength	% < 425	w %	w_P %	w_L %	q Mg/m^3	c_u kN/m^2	OTHER TESTS AND NOTES
				Topsoil (Gravelly topsoil) [Driller's description]													
						106.95	0.45	0.50	D1								Hand excavated from ground level to 1.20m
				Very stiff red brown and light grey sandy silty CLAY with occasional subrounded fine-coarse quartzite gravel and rare fine-medium gravel size ash fragments (Till)				1.00	D2								
						106.20	1.20	1.10-1.55	C1	N=45							Particle size distribution
				Dense red brown silty fine-coarse SAND with rare subrounded fine quartzite gravel (Glaciofluvial Deposits)				1.20-1.50	B1								
								1.50	D3								
								2.00	D4								BRE SD1 chemical suite
								2.20-2.65	C2	N=43							
						105.00	2.40	2.30-2.60	B2								
				Very dense red brown clayey silty fine-medium SAND with some fine-coarse gravel size weakly cemented sandstone fragments (Wildmoor Sandstone Formation)				2.50	D5								Particle size distribution Chisel in use between 2.60 and 9.20m
								3.00-3.30	C3	50/150							
								3.00	D6								
								3.00-3.30	B3								
								3.50	D7								
								4.00	D8								
								4.10-4.25	C4	50*							
								4.20-4.50	B4								
								4.50	D9								
								5.00	D10								
								5.10-5.20	C5	50*							
								5.10-5.40	B5								
13/09/17	5.00	(1) ▼															Groundwater seepage recorded at 5.80m, fast inflow, rose to 5.63m after 20 minutes
								6.00	D11								
								6.50-6.60	C6	50*							
								6.50-6.80	B6								
								7.00	D12								
								8.10-8.20	C7	50*							
								8.50	D13								Borehole complete at 9.25m
13/09/17	9.20	5.63 C						9.20-9.25	C8	50*							50mm diameter HDPE pipe installed to 9.20m
						98.15	9.25										Pipework capped and protected with raised lockable cover

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min
(1)	5.80	5.70	5.70	5.63	5.63

WATER
▼ 1 First Strike
▽ 2 Subsequent Strike
N - Overnight Depth
C- Completion Depth
S Seepage not rising

SAMPLE KEY
D Small disturbed sample
B Bulk disturbed sample
W Water sample
U Undisturbed sample
P Piston sample

TEST KEY
S Standard penetration test
C Cone penetration test
K Permeability test
V In situ vane test

BLOWS / STRENGTH
N= N value
26/150 blows, for 150mm, drive after seating
26*, blows for part or whole of seating drive only
(26) U sample blow count
V = Vane Strength - kN/m^2

Fieldwork By	JH
Dates	13/09/17
Log	JMK

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Boring Methods	LIGHT CABLE PERCUSSION 150 mm DIAMETER CASED 150 mm DIAMETER G.L. TO 9.00 m	Hole No.	**BH231**
		Engineer				Sheet	1 of 1
Ground Level	107.00 m.A.O.D.	Coordinates	392787 m.E. 308882 m.N.			Job No	**14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST			LAB TESTING							
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst.	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Type & No.	Blows/ Strength	% < 425	w %	w_P %	w_L %	q Mg/m^3	c_u kN/m^2	OTHER TESTS AND NOTES
				Topsoil (Gravelly topsoil) [Driller's decription]		106.75	0.25	0.10	D1								Hand excavated from ground level to 1.20m
				Made Ground (Very stiff grey silty gravelly sandy clay with occasional fine-coarse gravel size brick, concrete and ash fragments and rare rootlets)				0.50	D2								
								1.20-1.45	C1	50/100							
				Made Ground (Soft dark grey silty gravelly sandy clay with occasional fine-medium gravel size brick and ash fragments, and rare pieces of wood)		105.75	1.25	1.20-1.50	B1								
								1.50	D3								
								2.00	D4								BRE SD1 chemical suite
								2.10-2.55	C2	N=5							
								2.20-2.50	B2								
								2.50	D5								
								3.00-3.45	C3	N=11							
								3.00	D6								
								3.10-3.40	B3								
								3.50	D7								BRE SD1 chemical suite
								4.00	D8								
				Very dense red brown clayey silty fine-medium SAND with occasional fine-coarse gravel size weakly cemented sandstone fragments (Wildmoor Sandstone Formation)		102.90	4.10	4.10-4.35	C4	50/100							Chisel in use between 4.10 and 9.00m
								4.20-4.50	B4								Particle size distribution and sedimentation
								4.50	D9								
19/09/17	4.50	(1) ▼						5.00-5.20	C5	50/50							Groundwater seepage recorded at 5.00m, fast inflow, rose to 4.90m after 20 minutes
								5.00	D10								
								5.10-5.40	B5								
								6.00	D11								
								6.20-6.50	B6								
								6.50-6.60	C6	50*							
								7.00	D12								
								8.20-8.30	C7	50*							
																	Borehole complete at 9.05m
19/09/17								9.00-9.05	C8	50*							50mm diameter HDPE pipe installed to 9.00m
						97.95	9.05										Pipework capped and protected with raised lockable cover

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min
(1)	5.00	4.90			

WATER
▼ 1 First Strike
▽ 2 Subsequent Strike
N - Overnight Depth
C- Completion Depth
S Seepage not rising

SAMPLE KEY
D Small disturbed sample
B Bulk disturbed sample
W Water sample
U Undisturbed sample
P Piston sample

TEST KEY
S Standard penetration test
C Cone penetration test
K Permeability test
V In situ vane test

BLOWS / STRENGTH
N= N value
26/150 blows, for 150mm, drive after seating
26*, blows for part or whole of seating drive only
(26) U sample blow count
V = Vane Strength - kN/m^2

Fieldwork By	JH
Dates	19/09/17
Log	JMK

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Boring Methods	LIGHT CABLE PERCUSSION 150 mm DIAMETER CASED 150 mm DIAMETER G.L. TO 7.00 m	Hole No.	**BH232**
		Engineer				Sheet	1 of 1
Ground Level	105.00 m.A.O.D.	Coordinates	392404 m.E. 308760 m.N.			Job No	**14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST			LAB TESTING						
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst.	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Type & No.	Blows/ Strength	% < 425	w %	w_P %	w_L %	ρ Mg/m^3	c_u kN/m^2	OTHER TESTS AND NOTES
				~~Topsoil (Gravelly topsoil) [Driller's description]~~		104.80	0.20										
				Made Ground (Soft-firm red brown and grey brown sandy silty gravelly clay with occasional fine-medium gravel size brick and ash fragments)													Hand excavated from ground level to 1.20m
								0.50	D1								
								1.00	D2								BRE SD1 chemical suite
								1.20-1.65	C1	N=8							
								1.20-1.50	B1								
								1.50	D3								
								2.00	D4								BRE SD1 chemical suite
								2.10-2.55	C2	N=17							
								2.20-2.50	B2								
								2.50	D5								
								3.00	D6								
				- becoming soft with depth				3.10-3.55	C3	N=8							
								3.20-3.50	B3								
								3.50	D7								
								3.70-4.15	C4	N=19							
						101.00	4.00										
				Very dense red brown slightly clayey silty fine-coarse SAND with a little fine-coarse gravel size weakly cemented red brown sandstone fragments (Wildmoor Sandstone Formation)				4.10-4.40	B4								
								4.50	D8								Particle size distribution and sedimentation
21/09/17	4.50	(1) ▼						5.00-5.30	C5	50/150							Groundwater seepage recorded at 5.00m, fast inflow, rose to 4.90m after 20 minutes
								5.00	D9								
21/09/17								5.10-5.40	B5								
								6.00-6.20	C6	50/50							Chisel in use between 5.00 and 7.00m
								6.00	D10								
								6.20-6.50	B6								
				- becoming less cemented with depth													
22/09/17	7.00	4.90 C						7.00-7.10	C7	50*							
						97.90	7.10	7.00	D11								Borehole complete at 7.10m

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min
(1)	5.00	4.90			

WATER
▼ 1 First Strike
▽ 2 Subsequent Strike
N - Overnight Depth
C- Completion Depth
S Seepage not rising

SAMPLE KEY
D Small disturbed sample
B Bulk disturbed sample
W Water sample
U Undisturbed sample
P Piston sample

TEST KEY
S Standard penetration test
C Cone penetration test
K Permeability test
V In situ vane test

BLOWS / STRENGTH
N= N value
26/150 blows, for 150mm, drive after seating
26*, blows for part or whole of seating drive only
(26) U sample blow count
V = Vane Strength - kN/m^2

Fieldwork By	JH
Dates	21/09/17 to 22/09/17
Log	JMK

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Boring Methods	LIGHT CABLE PERCUSSION 150 mm DIAMETER CASED 150 mm DIAMETER G.L. TO 7.60 m	Hole No.	**BH233**
		Engineer				Sheet	1 of 1
Ground Level	104.10 m.A.O.D.	Coordinates	392625 m.E. 308706 m.N.			Job No	**14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST			LAB TESTING						
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst.	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Type & No.	Blows/ Strength	% < 425	w %	w_P %	w_L %	ρ Mg/m^3	c_u kN/m^2	OTHER TESTS AND NOTES
				Topsoil (Gravelly topsoil) [Driller's description]		103.85	0.25										Hand excavated from ground level to 1.20m
				Made Ground (Firm grey brown silty sandy gravelly clay with occasional fine-medium gravel size brick and ash fragments and rare rootlets)				0.50	D1								
								1.00	D2								
								1.20-1.60	C1	50/250							
21/09/17	1.50	(1) ▼						1.50	D3								BRE SD1 chemical suite
				Made Ground (Medium dense dark grey silty sandy subrounded fine-coarse gravel with occasional fine-medium gravel size brick fragments)		102.30	1.80	2.00-2.45	C2	N=13							Groundwater seepage recorded at 1.80m, fast inflow, rose to 1.70m after 20 minutes
								2.00	D4								
								2.70	D5								
								3.00-3.45	C3	N=23							
				Very dense red brown silty very clayey fine-coarse SAND with some subangular fine-coarse gravel size weakly cemented sandstone fragments (Wildmoor Sandstone Formation)		101.00	3.10	3.10-3.40	B1								
								3.50	D6								Particle size distribution and sedimentation
		(2) ▽						3.90-4.20	C4	50/150							Groundwater seepage recorded at 4.40m, fast inflow, rose to 4.10m after 20 minutes
21/09/17	4.00							4.00	D7								
								4.00-4.30	B2								
								4.50	D8								
								5.00-5.20	C5	50/50							Chisel in use between 3.90 and 7.60m
								5.00	D9								
								5.10-5.40	B3								
								6.00	D10								
				- becoming less clayey and more cemented with depth				6.40-6.55	C6	50*							
								6.50-6.80	B4								
								7.00	C7								
								7.00	D11								
21/09/17	7.60	4.10 C				96.40	7.70										Borehole complete at 7.70m
																	50mm diameter HDPE pipe installed to 7.60m
																	Pipework capped and protected with flush lockable cover

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min
(1)	1.80	1.70			
(2)	4.40	4.20	4.10	4.10	4.10

WATER
▼ 1 First Strike
▽ 2 Subsequent Strike
N - Overnight Depth
C- Completion Depth
S Seepage not rising

SAMPLE KEY
D Small disturbed sample
B Bulk disturbed sample
W Water sample
U Undisturbed sample
P Piston sample

TEST KEY
S Standard penetration test
C Cone penetration test
K Permeability test
V In situ vane test

BLOWS / STRENGTH
N= N value
26/150 blows, for 150mm, drive after seating
26*, blows for part or whole of seating drive only
(26) U sample blow count
V = Vane Strength - kN/m^2

Fieldwork By	JH
Dates	21/09/17
Log	JMK

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Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Boring Methods	LIGHT CABLE PERCUSSION 150 mm DIAMETER CASED 150 mm DIAMETER G.L. TO 6.20 m	Hole No.	**BH234**
		Engineer				Sheet	1 of 1
Ground Level	107.60 m.A.O.D.	Coordinates	392941 m.E. 309021 m.N.			Job No	**14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST			LAB TESTING						
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst.	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Type & No.	Blows/ Strength	% < 425	w %	w_P %	w_L %	ρ Mg/m^3	c_u kN/m^2	OTHER TESTS AND NOTES
				Topsoil (Gravelly topsoil) [Driller's description]		107.30	0.30										Hand excavated from ground level to 1.20m
				Firm red brown, light brown and light grey clayey sandy SILT with occasional pockets of black/ brown silt (Till)		106.60	1.00	0.50	D1		99	15.2		24			
				Very dense red brown and occasional light brown clayey silty fine-medium SAND with occasional subrounded fine-coarse gravel size weakly cemented sandstone fragments (Wildmoor Sandstone Formation)				1.00	D2								Chisel in use between 1.00 and 6.20m
								1.10-1.30	C1	50/50							Particle size distribution and sedimentation
								1.20-1.50	B1								BRE SD1 chemical suite
								1.50	D3								
								2.00	D4								
								2.10-2.40	C2	50/150							
								2.20-2.50	B2								
								2.50	D5								
								3.00-3.15	C3	50*							
								3.00	D6								
								3.10-3.40	B3								
								3.50	D7								
								4.00	D8								
								4.10-4.20	C4	50*							
								4.10-4.40	B4								
								4.50	D9								
								5.00-5.25	C5	50/100							
								5.00	D10								
								5.10-5.40	B5								
14/09/17	5.50	(1) ▼						6.00	D11								Groundwater seepage recorded at 6.20m, fast inflow
14/09/17						101.20	6.40	6.20-6.40	C6	50/50							
																	Borehole complete at 6.40m
																	33mm diameter HDPE pipe installed to 5.00m
																	Pipework capped and protected with raised lockable cover

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min
(1)	6.20	6.00	5.80	5.70	5.70

WATER
▼ 1 First Strike
▽ 2 Subsequent Strike
N - Overnight Depth
C- Completion Depth
S Seepage not rising

SAMPLE KEY
D Small disturbed sample
B Bulk disturbed sample
W Water sample
U Undisturbed sample
P Piston sample

TEST KEY
S Standard penetration test
C Cone penetration test
K Permeability test
V In situ vane test

BLOWS / STRENGTH
N= N value
26/150 blows, for 150mm, drive after seating
26*, blows for part or whole of seating drive only
(26) U sample blow count
V = Vane Strength - kN/m^2

Fieldwork By	JH
Dates	14/09/17
Log	JMK

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Boring Methods	PERCUSSIVE WINDOWLESS SAMPLER	Hole No.	**WS325**
		Engineer				Sheet	1 of 1
Ground Level	107.90 m.A.O.D.	Coordinates	392960 m.E. 309330 m.N.			Job No	**14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST			LAB TESTING						
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst.	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Type & No.	Blows/ Strength	% < 425	w %	w_P %	w_L %	ρ Mg/m^3	c_u kN/m^2	OTHER TESTS AND NOTES
				Topsoil (Dark brown silty fine-coarse sand with some rounded-subangular fine-medium quartzite gravel)		107.50	0.40										Hand excavated from ground level to 0.60m
				Very stiff/hard light brown and mottled orange/ brown/grey slightly gravelly silty very sandy CLAY (desiccated). Gravel composed of subangular-subrounded medium-coarse quartzite, sandstone and mudstone (Till)				0.60-1.00	U1								
								0.80	D1								Organic content and BRE SD1 chemical suite
								0.80	HV1	(HV=>140)							
								1.00-2.00	U2								
				- becoming very clayey/clayey medium-coarse SAND				1.20	D2		70	5.4	10	18			
								1.20	HV2	(HV=>140)							
				Light brown/red clayey silty very gravelly fine-coarse SAND. Gravel composed of subrounded fine-coarse quartzite and rare sandstone (Glaciofluvial Deposits)		106.40	1.50										
								1.90	D3								Particle size distribution and sedimentation
								2.00-3.00	U3								
				- becoming less gravelly													
				- becoming red/brown													
				Red/brown locally yellow/light brown slightly clayey very silty fine-medium SAND (Wildmoor Sandstone Formation)		104.90	3.00	3.00-4.00	U4								
								3.50	D4								Particle size distribution and sedimentation
26/09/17		DRY	C														No groundwater encountered
						103.90	4.00										Window sample hole complete at 4.00m
																	33mm pipe was installed to 4.00m
																	Pipework capped and protected with raised lockable cover

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min

WATER
- ▼ 1 First Strike
- ▽ 2 Subsequent Strike
- N - Overnight Depth
- C- Completion Depth
- S Seepage not rising

SAMPLE KEY
- D Small disturbed sample
- B Bulk disturbed sample
- W Water sample
- U Undisturbed sample
- P Piston sample

TEST KEY
- S Standard penetration test
- C Cone penetration test
- K Permeability test
- V In situ vane test

BLOWS / STRENGTH
- N= N value
- 26/150 blows, for 150mm, drive after seating
- 26*, blows for part or whole of seating drive only
- (26) U sample blow count
- V = Vane Strength - kN/m^2

Fieldwork By	NAB
Dates	26/09/17
Log	NAB

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Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Boring Methods	PERCUSSIVE WINDOWLESS SAMPLER	Hole No.	**WS326**
		Engineer				Sheet	1 of 1
Ground Level	108.10 m.A.O.D.	Coordinates	392960 m.E. 309330 m.N.			Job No	**14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST			LAB TESTING							
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst.	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Type & No.	Blows/ Strength	% < 425	w %	w_P %	w_L %	ρ Mg/m^3	c_u kN/m^2	OTHER TESTS AND NOTES
				Topsoil (Dark brown fine sand with occasional rounded-subrounded fine-coarse quartzite gravel)													Hand excavated from ground level to 0.80m
				Red/brown silty fine-coarse SAND with some subangular-subrounded fine-medium quartzite gravel (Glaciofluvial Deposits)		107.40	0.70	0.80-1.00	U1								Particle size distribution (D1)
								0.80	D1								Organic content and
								0.90	D2								BRE SD1 chemical suite (D2)
				Light brown/red silty fine-medium occasionally coarse SAND with some subrounded fine-medium quartzite gravel (Glaciofluvial Deposits)		107.05	1.05	1.00-2.00	U2								'Damp' from approximately 1.30m
26/09/17		(1) ▼						1.40	D3								Particle size distribution
26/09/17		(2) ▽				106.40	1.70										'Saturated' from approximately 1.70m
				Red/brown silty fine-medium SAND (Wildmoor Sandstone Formation)				2.00-3.00	U3								
				- becoming slightly cemented with depth				2.50	D4								Particle size distribution
								3.00-4.00	U4								
								3.50	D5								Particle size distribution
26/09/17						104.10	4.00										Window sample hole complete at 4.00m
																	33mm pipe was installed to 4.00m
																	Pipework capped and protected with raised lockable cover

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min
(1)	1.30				
(2)	1.70				

WATER
▼ 1 First Strike
▽ 2 Subsequent Strike
N - Overnight Depth
C- Completion Depth
S Seepage not rising

SAMPLE KEY
D Small disturbed sample
B Bulk disturbed sample
W Water sample
U Undisturbed sample
P Piston sample

TEST KEY
S Standard penetration test
C Cone penetration test
K Permeability test
V In situ vane test

BLOWS / STRENGTH
N= N value
26/150 blows, for 150mm, drive after seating
26*, blows for part or whole of seating drive only
(26) U sample blow count
V = Vane Strength - kN/m^2

Fieldwork By	NAB
Dates	26/09/17
Log	NAB

RSA GEOTECHNICS LTD

Project WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client WALDECK CONSULTING Engineer	Boring Methods PERCUSSIVE WINDOWLESS SAMPLER	Hole No. **WS327** Sheet 1 of 1 Job No **14317GI2**
Ground Level 107.30 m.A.O.D.	Coordinates 392600 m.E. 308860 m.N.		

WATER				STRATA				SAMPLING/IN SITU TEST			LAB TESTING						
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst.	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Type & No.	Blows/ Strength	% < 425	w %	w_P %	w_L %	ρ Mg/m^3	c_u kN/m^2	OTHER TESTS AND NOTES
				Topsoil (Dark brown/brown silty fine-coarse sand with occasional rounded-subangular fine-medium quartzite gravel)		106.90	0.40										Hand excavated from ground level to 0.80m
				Made Ground (Dark brown silty gravelly sand. Gravel composed of subangular fine-medium sandstone, brick and quartzite, also containing fragments of concrete, glass and road materials)				0.60	D1								BRE SD1 chemical suite
								0.80-1.00	U1								
								1.00-2.00	U2								U1 and U2: no sample recovery
								1.00	D2								
				- block of asphalt retrieved from bottom of U2, preventing sample recovery in U1 and U2		105.20	2.10	2.00-3.00	U3								
				Made Ground (Red/brown slightly silty medium-coarse sand wtih much rounded-subrounded quartzite and sandstone gravel)				2.40	D3								BRE SD1 chemical suite
						104.50	2.80										'Damp' from approximately 3.00m
27/09/17		(1) ▼		Made Ground (Soft brown/dark brown silty clay with occasional subrounded fine-medium quartzite gravel and rare brick fragments)				3.00-4.00	U4								
				Red/brown clayey very silty fine-medium SAND (Wildmoor Sandstone Formation)		103.90	3.40										
27/09/17		DAMP C				103.30	4.00	3.80	D4								Particle size distribution and sedimentation Window sample hole complete at 4.00m 33mm pipe was installed to 4.00m Pipework capped and protected with raised lockable cover

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min
(1)	3.00				

WATER
▼ 1 First Strike
▽ 2 Subsequent Strike
N - Overnight Depth
C- Completion Depth
S Seepage not rising

SAMPLE KEY
D Small disturbed sample
B Bulk disturbed sample
W Water sample
U Undisturbed sample
P Piston sample

TEST KEY
S Standard penetration test
C Cone penetration test
K Permeability test
V In situ vane test

BLOWS / STRENGTH
N= N value
26/150 blows, for 150mm, drive after seating
26*, blows for part or whole of seating drive only
(26) U sample blow count
V = Vane Strength - kN/m^2

Fieldwork By	NAB
Dates	27/09/17
Log	NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Boring Methods	PERCUSSIVE WINDOW SAMPLER	Hole No.	**WS328**
		Engineer				Sheet	1 of 1
Ground Level	107.30 m.A.O.D.	Coordinates	393034 m.E. 309218 m.N.			Job No	**14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST			LAB TESTING						
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst.	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Type & No.	Blows/ Strength	% < 425	w %	w_P %	w_L %	ρ Mg/m^3	c_u kN/m^2	OTHER TESTS AND NOTES
				Topsoil (Light brown silty/very silty sand with some/much rounded-subrounded occasional subangular fine-coarse quartzite and occasional sandstone gravel)		107.00	0.30										Hand excavated from ground level to 1.00m
				Brown/light brown very silty fine-medium SAND with much rounded-subrounded fine-coarse quartzite gravel (Glaciofluvial Deposits)		106.70	0.60	0.50	D1								Particle size distribution
				Stiff/very stiff red/brown slightly sandy silty CLAY with occasional subangular-subrounded fine-medium occasionally coarse quartzite gravel (Till)				0.75	D2		81	14.1	16	36			
								0.80	HV1	(HV=>140)							
								0.90	D3								
				- becoming very silty		106.20	1.10	1.00-2.00	U1								
				Red/brown locally yellow/brown clayey silty fine-medium SAND (Wildmoor Sandstone Formation)				1.90	D4								Particle size distribution and sedimentation
								2.00-2.70	U2								
				- becoming partly cemented				2.70-3.10	U3								
26/10/17		DRY	C					3.10-3.20	U4								No groundwater encountered
						104.10	3.20										Window sample hole complete at 3.20m
																	33mm pipe was installed to 3.20m
																	Pipework capped and protected with raised lockable cover
																	Unable to progress beyond 3.20m - too dense

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min

WATER
- ▼ 1 First Strike
- ▽ 2 Subsequent Strike
- N - Overnight Depth
- C- Completion Depth
- S Seepage not rising

SAMPLE KEY
- D Small disturbed sample
- B Bulk disturbed sample
- W Water sample
- U Undisturbed sample
- P Piston sample

TEST KEY
- S Standard penetration test
- C Cone penetration test
- K Permeability test
- V In situ vane test

BLOWS / STRENGTH
- N= N value
- 26/150 blows, for 150mm, drive after seating
- 26*, blows for part or whole of seating drive only
- (26) U sample blow count
- V = Vane Strength - kN/m^2

Fieldwork By	NAB
Dates	26/10/17
Log	NAB

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Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Boring Methods	PERCUSSIVE WINDOWLESS SAMPLER	Hole No.	**WS330**
		Engineer				Sheet	1 of 1
Ground Level	107.30 m.A.O.D.	Coordinates	392600 m.E. 308860 m.N.			Job No	**14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST			LAB TESTING						
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst.	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Type & No.	Blows/ Strength	% < 425	w %	w_P %	w_L %	ρ_d Mg/m^3	c_u kN/m^2	OTHER TESTS AND NOTES
				Topsoil (Dark brown silty fine-medium sand with a little quartzite gravel)													Hand excavated from ground level to 0.90m
				Made Ground (Firm/stiff red/brown and grey silty clay with some angular-subangular medium-coarse sandstone gravel and fragments of ash, mudstone and brick)		106.85	0.45	0.70	D1								BRE SD1 chemical suite
				- limited sample recovery from 1.00-3.00m				0.90-1.00	U1								
								1.00-2.00	U2								U2: 10% recovery
27/09/17		(1) ▼		Made Ground (Brown, red/brown and black gravelly sand. Gravel composed of subangular fine-medium quartzite and rare brick)		105.30	2.00	2.00-3.00	U3								BRE SD1 chemical suite
								2.00	D2								U3: 20% recovery
																	'Damp' at 2.10m (perched)
				- becoming brown with depth				3.00-4.00	U4								
				Red/brown silty clayey fine-medium SAND (Wildmoor Sandstone Formation)		103.80	3.50	3.60	D3								BRE SD1 chemical suite
27/09/17								3.90	D4								Particle size distribution and sedimentation
						103.30	4.00										Window sample hole complete at 4.00m
																	33mm pipe was installed to 4.00m
																	Pipework capped and protected with raised lockable cover

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min
(1)	2.10				

WATER
▼ 1 First Strike
▽ 2 Subsequent Strike
N - Overnight Depth
C- Completion Depth
S Seepage not rising

SAMPLE KEY
D Small disturbed sample
B Bulk disturbed sample
W Water sample
U Undisturbed sample
P Piston sample

TEST KEY
S Standard penetration test
C Cone penetration test
K Permeability test
V In situ vane test

BLOWS / STRENGTH
N= N value
26/150 blows, for 150mm, drive after seating
26*, blows for part or whole of seating drive only
(26) U sample blow count
V = Vane Strength - kN/m^2

Fieldwork By	NAB
Dates	27/09/17
Log	NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Boring Methods	PERCUSSIVE WINDOWLESS SAMPLER	Hole No.	**WS331**
		Engineer				Sheet	1 of 1
Ground Level	105.10 m.A.O.D.	Coordinates	392444 m.E. 308797 m.N.			Job No	**14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST			LAB TESTING							
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst.	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Type & No.	Blows/ Strength	% < 425	w %	w_P %	w_L %	q Mg/m^3	c_u kN/m^2	OTHER TESTS AND NOTES
				Topsoil (Brown slightly silty fine-coarse sand with occasional subangular-subrounded fine-medium quartzite and sandstone gravel)		104.70	0.40										
				Made Ground (Dark brown/black silty sand with much subangular fine-coarse gravel size fragments of brick, concrete and sandstone)				0.50	D1								BRE SD1 chemical suite
								0.90-1.90	U1								
								1.50	D2								BRE SD1 chemical suite
				Made Ground (Brown/dark brown silty sand with rare subrounded fine-medium sandstone gravel and brick fragments - poor recovery 1.90-2.90m)		103.50	1.60										U2: 25% recovery
26/09/17		(1) ▼						1.90-2.90	U2								'Damp' at approximately 1.90m
								2.90-3.50	U3								
26/09/17						101.70	3.40										
				Red/brown slightly silty very sandy rounded-subangular fine-coarse quartzite GRAVEL (Glaciofluvial Deposits)		101.60	3.50	3.45	D3								Particle size distribution
																	Window sample hole complete at 3.50m 33mm pipe was installed to 3.50m
																	Pipework capped and protected with raised lockable cover

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min
(1)	1.90				

WATER
▼ 1 First Strike
▽ 2 Subsequent Strike
N - Overnight Depth
C- Completion Depth
S Seepage not rising

SAMPLE KEY
D Small disturbed sample
B Bulk disturbed sample
W Water sample
U Undisturbed sample
P Piston sample

TEST KEY
S Standard penetration test
C Cone penetration test
K Permeability test
V In situ vane test

BLOWS / STRENGTH
N= N value
26/150 blows, for 150mm, drive after seating
26*, blows for part or whole of seating drive only
(26) U sample blow count
V = Vane Strength - kN/m^2

Fieldwork By	NAB
Dates	26/09/17
Log	NAB

RSA GEOTECHNICS LTD

Project WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client WALDECK CONSULTING Engineer	Boring Methods PERCUSSIVE WINDOWLESS SAMPLER	Hole No. **WS332** Sheet 1 of 1 Job No **14317GI2**
Ground Level 105.10 m.A.O.D.	Coordinates 392697 m.E. 308755 m.N.		

WATER				STRATA				SAMPLING/IN SITU TEST			LAB TESTING						
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst.	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Type & No.	Blows/ Strength	% < 425	w %	w_P %	w_L %	ρ Mg/m^3	c_u kN/m^2	OTHER TESTS AND NOTES
				Topsoil (Dark brown silty sand with subangular-subrounded fine-medium quartzite and sandstone gravel)		104.70	0.40										Hand excavated from ground level to 0.80m
				Made Ground (Red/brown silty fine-medium sand with much subangular fine-coarse gravel size brick fragments, occasional dark brown/black coarse gravel size pockets of silty sand, rare wood fragments and subangular medium gravel size concrete fragments)				0.50	D1								
								0.80-1.00	U1								BRE SD1 chemical suite
								0.80	D2								
								1.00-2.00	U2								
				- becoming clayey													
								2.00-3.00	U3								
				Made Ground (Firm red/brown very silty very sandy clay with occasional subangular fine-medium brick and sandstone gravel)		102.90	2.20										
				Made Ground (Firm/stiff brown silty sandy clay with occasional rounded medium quartzite gravel, subangular medium gravel size brick fragments)		102.70	2.40	2.60	D3								BRE SD1 chemical suite
								3.00-4.00	U4								
26/09/17		(1) ▼															'Damp' from approximately 3.50m
				Red/orange/brown silty fine-medium SAND (Wildmoor Sandstone Formation)		101.40	3.70	3.80	D4								Particle size distribution
26/09/17		DAMP C				101.10	4.00										Window sample hole complete at 4.00m
																	33mm pipe was installed to 4.00m
																	Pipework capped and protected with raised lockable cover

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min
(1)	3.50				

WATER
▼ 1 First Strike
▽ 2 Subsequent Strike
N - Overnight Depth
C- Completion Depth
S Seepage not rising

SAMPLE KEY
D Small disturbed sample
B Bulk disturbed sample
W Water sample
U Undisturbed sample
P Piston sample

TEST KEY
S Standard penetration test
C Cone penetration test
K Permeability test
V In situ vane test

BLOWS / STRENGTH
N= N value
26/150 blows, for 150mm, drive after seating
26*, blows for part or whole of seating drive only
(26) U sample blow count
V = Vane Strength - kN/m^2

Fieldwork By	NAB
Dates	26/09/17
Log	NAB

RSA GEOTECHNICS LTD

Project WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client WALDECK CONSULTING Engineer	Boring Methods PERCUSSIVE WINDOWLESS SAMPLER	Hole No. **WS333** Sheet 1 of 1 Job No **14317GI2**
Ground Level 106.00 m.A.O.D.	Coordinates 392921 m.E. 308773 m.N.		

WATER				STRATA				SAMPLING/IN SITU TEST			LAB TESTING						
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst.	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Type & No.	Blows/ Strength	% < 425	w %	w_P %	w_L %	q Mg/m^3	c_u kN/m^2	OTHER TESTS AND NOTES
				Topsoil (Dark brown silty sand with subangular-subrounded fine-medium quartzite and sandstone gravel)		105.65	0.35										Hand excavated from ground level to 1.20m
				Made Ground (Brown and brown/orange and occasional dark brown/black silty sand with medium-coarse gravel size soft brown, grey/brown clay pockets and subrounded medium-coarse sandstone gravel)				0.60	D1								BRE SD1 chemical suite
				- becoming mottled red/grey mottled				1.00	D2								BRE SD1 chemical suite
								1.20-2.70	U1								
				Firm red/brown slightly sandy silty CLAY with some-much rounded-subrounded medium-coarse quartzite gravel (Till)		104.60	1.40	1.50	D3		72	15.7	13	26			
								1.60	HV1	(HV=71)							
				Red/brown sandy rounded-subrounded fine-coarse quartzite GRAVEL (Glaciofluvial Deposits)		104.00	2.00										
				Firm red/brown slightly sandy silty CLAY with some-much rounded-subrounded medium-coarse quartzite gravel (Till)		103.80	2.20										
05/10/17		(1) ▼															Groundwater seepage recorded at 2.60m
				Red/brown and brown slightly silty very sandy rounded-subangular fine-coarse quartzite GRAVEL (Glaciofluvial Deposits)		103.30	2.70	2.70-3.70	U2								
								3.00	D4								Particle size distribution
05/10/17						102.30	3.70										Window sample hole complete at 3.70m - too dense to continue
																	33mm pipe was installed to 3.70m
																	Pipework capped and protected with raised lockable cover

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min
(1)	2.60				

WATER
▼ 1 First Strike
▽ 2 Subsequent Strike
N - Overnight Depth
C- Completion Depth
S Seepage not rising

SAMPLE KEY
D Small disturbed sample
B Bulk disturbed sample
W Water sample
U Undisturbed sample
P Piston sample

TEST KEY
S Standard penetration test
C Cone penetration test
K Permeability test
V In situ vane test

BLOWS / STRENGTH
N= N value
26/150 blows, for 150mm, drive after seating
26*, blows for part or whole of seating drive only
(26) U sample blow count
V = Vane Strength - kN/m^2

Fieldwork By	NAB
Dates	05/10/17
Log	NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Boring Methods	PERCUSSIVE WINDOWLESS SAMPLER	Hole No.	**WS334**
		Engineer				Sheet	1 of 1
Ground Level	106.10 m.A.O.D.	Coordinates	392831 m.E. 308790 m.N.			Job No	**14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST			LAB TESTING							
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst.	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Type & No.	Blows/ Strength	% < 425	w %	w_P %	w_L %	ρ_d Mg/m^3	c_u kN/m^2	OTHER TESTS AND NOTES
				Topsoil (Dark brown silty sand with subangular-subrounded fine-medium quartzite and sandstone gravel)		105.70	0.40										Hand excavated from ground level to 0.60m
03/10/17		DRY	C	Made Ground (Dark brown, red/brown slightly silty sand with much gravel composed of angular-subrounded fine-coarse sandstone, brick, concrete, some angular-subangular fine-medium gravel size ash fragments and rare fragments of metal (tin)) - cobble size block of reinforced concrete between 0.50 and 0.60m		105.50	0.60	0.60	D1								Window sample hole complete at 0.60m - unable to progress through block of reinforced concrete

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min

WATER
- ▼ 1 First Strike
- ▽ 2 Subsequent Strike
- N - Overnight Depth
- C- Completion Depth
- S Seepage not rising

SAMPLE KEY
- D Small disturbed sample
- B Bulk disturbed sample
- W Water sample
- U Undisturbed sample
- P Piston sample

TEST KEY
- S Standard penetration test
- C Cone penetration test
- K Permeability test
- V In situ vane test

BLOWS / STRENGTH
- N= N value
- 26/150 blows, for 150mm, drive after seating
- 26*, blows for part or whole of seating drive only
- (26) U sample blow count
- V = Vane Strength - kN/m^2

Fieldwork By	NAB
Dates	05/10/17
Log	NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Boring Methods	PERCUSSIVE WINDOWLESS SAMPLER	Hole No.	**WS334A**
		Engineer				Sheet	1 of 1
Ground Level	105.80 m.A.O.D.	Coordinates	392825 m.E. 308776 m.N.			Job No	**14317GI2**

WATER				STRATA				SAMPLING/IN SITU TEST			LAB TESTING							
Date/Time at Depth	Depth of Casing m	Depth to Water m	Inst.	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Type & No.	Blows/ Strength	% < 425	w %	w_P %	w_L %	ρ Mg/m^3	c_u kN/m^2	OTHER TESTS AND NOTES
				Topsoil (Dark brown silty sand with subangular-subrounded fine-medium quartzite and sandstone gravel)		105.45	0.35										Hand excavated from ground level to 1.20m
				Made Ground (Brown/red silty sand with much gravel composed of subangular fine-coarse brick, sandstone, quartzite and coarse gravel size pockets of firm red/grey silty clay) - possible fragment of asbestos containing material (cement)				0.60	D1								
								1.00	D2								BRE SD1 chemical suite
				Made Ground (Firm/stiff brown silty clay with some angular-subrounded medium-coarse gravel size fragments of brick, sandstone, quartzite, ash and wood)		104.60	1.20	1.20-2.70	U1								
				Made Ground (Dark grey/black rounded-subrounded medium-coarse quartzite gravel)		104.00	1.80										
				Made Ground (Red/brown and brown/dark brown silty sandy clay with subangular fine-medium gravel size brick fragments and subrounded medium quartzite gravel)		103.90	1.90	2.00	D3								BRE SD1 chemical suite
				Made Ground (Dark brown, red/brown, black slightly silty fine-coarse sand with some rounded-subrounded medium quartzite gravel)		103.20	2.60	2.70-4.20	U2								
				Red/brown, occasionally yellow/brown clayey silty fine-medium SAND (Wildmoor Sandstone Formation)		102.20	3.60	3.70	D4								Particle size distribution and sedimentation
03/10/17		DRY	C			101.60	4.20										No groundwater encountered Window sample hole complete at 4.20m On completion sides of window sample hole collapsed to 2.90m

Water Level observations during boring, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min

WATER
- ▼ 1 First Strike
- ▽ 2 Subsequent Strike
- N - Overnight Depth
- C- Completion Depth
- S Seepage not rising

SAMPLE KEY
- D Small disturbed sample
- B Bulk disturbed sample
- W Water sample
- U Undisturbed sample
- P Piston sample

TEST KEY
- S Standard penetration test
- C Cone penetration test
- K Permeability test
- V In situ vane test

BLOWS / STRENGTH
- N= N value
- 26/150 blows, for 150mm, drive after seating
- 26*, blows for part or whole of seating drive only
- (26) U sample blow count
- V = Vane Strength - kN/m^2

Fieldwork By	NAB
Dates	03/10/17
Log	NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Trial Pit Excavation Methods	WHEELED MECHANICAL EXCAVATOR	Hole No.	**TP425**
		Engineer				Sheet	1 of 2
Ground Level	107.40 m.A.O.D.	Coordinates	392867 m.E. 309227 m.N.	Pit Dimensions: Length - 2.30 m	Width - 0.60 m	Job No	**14317GI2**
				Orientation: Length -			

WATER		STRATA				SAMPLING/IN SITU TEST			LAB TESTING				OTHER TESTS AND NOTES
Date/Time at Depth	Depth to Water m	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Type & No.	Test Result	% < 425	w %	w_P %	w_L %	
		Topsoil (Dark brown silty fine sand with a little subangular-rounded fine-coarse quartzite and sandstone gravel and occasional rootlets)				0.10	D1						
				107.12	0.28								
		Firm light grey slightly sandy silty CLAY with occasional pockets of reddish brown clay and subangular medium-coarse sandstone and quartzite gravel (Till)		107.02	0.38	0.35	D2		91	21.2	19	38	HSV at 0.50m = >140kN/m2
		Hard reddish brown sandy silty CLAY with a little subangular-rounded fine-coarse quartzite and sandstone gravel (Till)		106.65	0.75	0.80	D3						
		Red brown slightly clayey silty fine-medium SAND (Glaciofluvial Deposits)				1.30	B1						California bearing ratio
						1.80	D4						Particle size distribution and sedimentation
		Red brown silty fine-medium SAND with much coarse gravel size clayey pockets and occasional partings of light grey fine sand (Wildmoor Sandstone Formation)		105.40	2.00	2.20	D5						BRE SD1 chemical suite
		- with weakly cemented sandstone layers from approximately 2.70m				2.70	D6						Particle size distribution and sedimentation
		- no clayey pockets with depth				3.20	B2						
		- becoming more cemented with depth				3.60	D7						
21/09/17	DRY C												No groundwater encountered
				103.50	3.90	3.90	D8						Trial pit complete at 3.90m

Pit Stability, Shoring, etc.
No collapse of sides of trial pit

Water Level observations during digging, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min

WATER
- ▼ 1 First Strike
- ▽ 2 Subsequent Strike
- N - Overnight Depth
- C- Completion Depth
- S Seepage not rising

SAMPLE AND TEST KEY
- D Small disturbed sample
- B Bulk disturbed sample
- W Water sample
- U Undisturbed sample
- K Percolation Test
- PP Perth Penetrometer Test
- HV Hand shear vane test
- SRD Sand replacement density test
- CBR In situ CBR test
- PB Plate Bearing Test

TEST RESULT
- Np= Np Value
- V= Average Hand Shear Vane Strength - kN/m^2
- BD= In-Situ Bulk Density - Mg/m^3
- CBR= California Bearing Ratio - %

Fieldwork By	CJS
Dates	21/09/17
Log	CJS/NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Trial Pit Excavation Methods	WHEELED MECHANICAL EXCAVATOR	Hole No.	**TP426**
		Engineer				Sheet	1 of 2
Ground Level	107.60 m.A.O.D.	Coordinates	393197 m.E. 309222 m.N.	Pit Dimensions: Length - 2.20 m Width - 0.60 m Orientation: Length -		Job No	**14317GI2**

WATER		STRATA				SAMPLING/IN SITU TEST			LAB TESTING				
Date/Time at Depth	Depth to Water m	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Type & No.	Test Result	% < 425	w %	w_P %	w_L %	OTHER TESTS AND NOTES
		Topsoil (Dark brown fine sand with occasional rounded-subrounded medium-coarse quartzite gravel, rare ceramic fragments and rootlets)		107.31	0.29	0.20	D1						
		Light grey and light brown silty fine-coarse SAND with much coarse gravel-cobble size silty clayey pockets and some fine-coarse quartzite gravel (Glaciofluvial Deposits)		106.98	0.62	0.55	D2						Particle size distribution and sedimentation
		Red brown, orangish light grey slightly silty fine-medium SAND with a little fine-coarse quartzite gravel (Glaciofluvial Deposits)				1.00	D3						BRE SD1 chemical suite
						1.40	B1						California bearing ratio
		Red brown clayey silty fine-medium SAND (Wildmoor Sandstone Formation)		106.10	1.50								
		Red brown fine-medium SAND with bands of orangish yellow fine-medium sand. Horizontal beds up to approximately 0.50m wide (Wildmoor Sandstone Formation) - with depth occasional weakly cemented sandstone <10mm thick		105.55	2.05	2.00	D4						Particle size distribution and sedimentation
						2.40	B2						Shear box test (60mm)
						3.00	D5						No groundwater encountered
20/09/17	DRY C			104.20	3.40	3.40	D6						Trial pit complete at 3.40m - unable to penetrate further

Pit Stability, Shoring, etc.
No collapse of sides of trial pit

Water Level observations during digging, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min

WATER
- ▼ 1 First Strike
- ▽ 2 Subsequent Strike
- N - Overnight Depth
- C- Completion Depth
- S Seepage not rising

SAMPLE AND TEST KEY
- D Small disturbed sample
- B Bulk disturbed sample
- W Water sample
- U Undisturbed sample
- K Percolation Test
- PP Perth Penetrometer Test
- HV Hand shear vane test
- SRD Sand replacement density test
- CBR In situ CBR test
- PB Plate Bearing Test

TEST RESULT
- Np= Np Value
- V= Average Hand Shear Vane Strength - kN/m^2
- BD= In-Situ Bulk Density - Mg/m^3
- CBR= California Bearing Ratio - %

Fieldwork By	CJS
Dates	20/09/17
Log	CJS/NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Trial Pit Excavation Methods	WHEELED MECHANICAL EXCAVATOR	Hole No.	**TP427**
		Engineer				Sheet	1 of 2
Ground Level	107.40 m.A.O.D.	Coordinates	393260 m.E. 309214 m.N.	Pit Dimensions: Length - 2.00 m	Width - 0.60 m	Job No	**14317GI2**
				Orientation: Length -			

WATER		STRATA				SAMPLING/IN SITU TEST			LAB TESTING				OTHER TESTS AND NOTES
Date/Time at Depth	Depth to Water m	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Type & No.	Test Result	% < 425	w %	w_P %	w_L %	
		Topsoil (Dark brown silty fine-medium sand with a little rounded-subrounded coarse quartzite gravel and rare rootlets)				0.10	D1						
				107.07	0.33								
		Light grey and light brown silty fine-coarse SAND with a little rounded-subrounded fine-medium quartzite gravel and occasional coarse gravel size clayey pockets (Glaciofluvial Deposits)				0.50	D2						Particle size distribution (D2)
						0.50	B1						Dry density/moisture content relationship and California bearing ratio, 2.5 kg rammer method (B11, CP111, CP112, CP113),
				106.60	0.80								
		Light red brown with occasional grey silty fine-medium SAND with occasional fine quartzite gravel (Glaciofluvial Deposits)				1.00	D3						Dry density/moisture content relationship and California bearing ratio - vibrating hammer (B12, CP121, CP122, CP123) and Particle density (Combined sample B1 with TP429 B1, TP431 B2 and SP8 B1) (Earthworks 1) BRE SD1 chemical suite (D3)
						1.50	D4						Particle size distribution (D4)
				105.80	1.60								
		Red brown slightly silty fine-medium SAND with interbedded orangish yellow fine-medium sand in wedge shaped subhorizontal beds (Wildmoor Sandstone Formation)				2.00	D5						Dry density/moisture content relationship and California bearing ratio, 2.5 kg rammer method (B21, CP211, CP212, CP213),
		- becoming weakly cemented with depth				2.00	B2						
						2.50	D6						Dry density/moisture content relationship and California bearing ratio - vibrating hammer (B22, CP221, CP222, CP223) and Particle density (Combined sample B2 with TP430 B2, TP434 B1 and SP10 B1) (Earthworks 2)
		- from approximately 2.70m, recovered as weakly cemented subangular medium-coarse sandstone gravel layers				3.00	D7						BRE SD1 chemical suite (D7)
20/09/17	DRY C												No groundwater encountered
				104.00	3.40								Trial pit complete at 3.40m
						3.50	B3						

Pit Stability, Shoring, etc.

No collapse of sides of trial pit

Water Level observations during digging, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min

WATER
- ▼ 1 First Strike
- ▽ 2 Subsequent Strike
- N - Overnight Depth
- C- Completion Depth
- S Seepage not rising

SAMPLE AND TEST KEY
- D Small disturbed sample
- B Bulk disturbed sample
- W Water sample
- U Undisturbed sample
- K Percolation Test
- PP Perth Penetrometer Test
- HV Hand shear vane test
- SRD Sand replacement density test
- CBR In situ CBR test
- PB Plate Bearing Test

TEST RESULT
- Np= Np Value
- V= Average Hand Shear Vane Strength - kN/m^2
- BD= In-Situ Bulk Density - Mg/m^3
- CBR= California Bearing Ratio - %

Fieldwork By	AJD
Dates	20/09/17
Log	CJS

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Trial Pit Excavation Methods	WHEELED MECHANICAL EXCAVATOR	Hole No.	**TP428**
		Engineer				Sheet	1 of 2
Ground Level	106.70 m.A.O.D.	Coordinates	392562 m.E. 308960 m.N.	Pit Dimensions: Length - 2.20 m	Width - 0.60 m	Job No	**14317GI2**
				Orientation: Length -			

WATER		STRATA				SAMPLING/IN SITU TEST			LAB TESTING				OTHER TESTS AND NOTES
Date/Time at Depth	Depth to Water m	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Type & No.	Test Result	% < 425	w %	w_P %	w_L %	
		Topsoil (Dark brown fine sand with a little subangular-subrounded fine-medium quartzite gravel and occasional rootlets)		106.40	0.30	0.10	D1						
		Made Ground (Dark grey brown sandy clay with occasional fragments of tile, red brick, plastic, concrete, timber, metal, fragment of suspected asbestos containing material (tile), clinker, railway sleeper and cloth)				0.50	D2						
						1.00	D3						
						1.50	D4						BRE SD1 chemical suite
						2.00	D5						
				104.30	2.40								
20/09/17	DRY C	Red brown silty clayey fine-medium SAND with rare rounded-subrounded medium-coarse quartzite gravel (Glaciofluvial Deposits)		104.00	2.70	2.50	D6						Particle size distribution and sedimentation No groundwater encountered Trial pit complete at 2.70m, made ground collapsing into pit

Pit Stability, Shoring, etc.

Trial pit unstable

Water Level observations during digging, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min

WATER

- ▼ 1 First Strike
- ▽ 2 Subsequent Strike
- N - Overnight Depth
- C- Completion Depth
- S Seepage not rising

SAMPLE AND TEST KEY

- D Small disturbed sample
- B Bulk disturbed sample
- W Water sample
- U Undisturbed sample
- K Percolation Test

- PP Perth Penetrometer Test
- HV Hand shear vane test
- SRD Sand replacement density test
- CBR In situ CBR test
- PB Plate Bearing Test

TEST RESULT

- Np= Np Value
- V= Average Hand Shear Vane Strength - kN/m^2
- BD= In-Situ Bulk Density - Mg/m^3
- CBR= California Bearing Ratio - %

Fieldwork By	CJS
Dates	20/09/17
Log	CJS/NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Trial Pit Excavation Methods	WHEELED MECHANICAL EXCAVATOR	Hole No.	**TP429**
		Engineer				Sheet	1 of 2
Ground Level	106.20 m.A.O.D.	Coordinates	393316 m.E. 308976 m.N.	Pit Dimensions: Length - 2.20 m Width - 0.60 m Orientation: Length -		Job No	**14317GI2**

WATER		STRATA				SAMPLING/IN SITU TEST			LAB TESTING				
Date/Time at Depth	Depth to Water m	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Type & No.	Test Result	% < 425	w %	w_P %	w_L %	OTHER TESTS AND NOTES
		Topsoil (Dark brown silty fine-medium sand with some subangular-well rounded fine-coarse quartzite gravel and rare rootlets)				0.10	D1						Pocket of darker soils, possibly ash or staining at NE corner of the pit between 0.45 and 0.80m
		Light brown and light grey fine-medium SAND with much subangular-well rounded fine-coarse quartzite and sandstone gravel (Glaciofluvial Deposits)		105.87	0.33	0.50	D2						BRE SD1 chemical suite
						1.00	B1						
		Red brown silty fine-medium SAND with occasional partings of orange and light brown fine-medium sand (Wildmoor Sandstone Formation)		105.10	1.10	1.50	D3						Particle size distribution
						2.00	B2						California bearing ratio
		- becoming weakly cemented from approximately 2.60m depth - weakly cemented light grey sandstone layers from approximately 2.80m <10mm in thickness				2.50	D4						
						3.00	D5						Particle size distribution
						3.50	B3						
20/09/17	DRY C												No groundwater encountered
				102.40	3.80	3.80	D6						Trial pit complete at 3.80m

Pit Stability, Shoring, etc.
No collapse of sides of trial pit

Water Level observations during digging, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min

WATER
- ▼ 1 First Strike
- ▽ 2 Subsequent Strike
- N - Overnight Depth
- C- Completion Depth
- S Seepage not rising

SAMPLE AND TEST KEY
- D Small disturbed sample
- B Bulk disturbed sample
- W Water sample
- U Undisturbed sample
- K Percolation Test

PP	Perth Penetrometer Test
HV	Hand shear vane test
SRD	Sand replacement density test
CBR	In situ CBR test
PB	Plate Bearing Test

TEST RESULT
- Np= Np Value
- V= Average Hand Shear Vane Strength - kN/m^2
- BD= In-Situ Bulk Density - Mg/m^3
- CBR= California Bearing Ratio - %

Fieldwork By	CJS
Dates	20/09/17
Log	CJS/NAB

RSA GEOTECHNICS LTD

Project WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client WALDECK CONSULTING Engineer	Trial Pit Excavation Methods WHEELED MECHANICAL EXCAVATOR	Hole No. **TP430**
		Pit Dimensions: Length - 1.80 m Width - 0.60 m	Sheet 1 of 2
Ground Level 107.50 m.A.O.D.	Coordinates 393100 m.E. 308972 m.N.	Orientation: Length -	Job No **14317GI2**

WATER		STRATA				SAMPLING/IN SITU TEST			LAB TESTING				
Date/Time at Depth	Depth to Water m	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Type & No.	Test Result	% < 425	w %	w_P %	w_L %	OTHER TESTS AND NOTES
		Topsoil (Dark brown silty fine-medium sand with a little rounded-subrounded coarse quartzite gravel and rare rootlets)				0.10	D1						
				107.18	0.32								
		Red brown and light grey brown silty fine-coarse SAND with some rounded-subrounded fine-medium quartzite gravel (Glaciofluvial Deposits)		106.95	0.55	0.50	D2						Particle size distribution
		Red brown fine-medium SAND with much rounded-subrounded fine-coarse quartzite gravel and rare subangular fine-medium sandstone gravel (Glaciofluvial Deposits)				1.00	D3						BRE SD1 chemical suite
						1.00	B1						California bearing ratio
				106.20	1.30								
		Red brown silty clayey fine-medium SAND with occasional layers of light grey and orange brown fine sand (Wildmoor Sandstone Formation)				1.50	D4						Particle size distribution and sedimentation
						2.00	D5						
						2.00	B2						
		- becoming weakly cemented from approximately 2.50m				2.50	D6						
		- with occasional partings of yellowish grey fine-medium sand from 2.80m - with occasional fine sandstone gravel at approximately 3.00m				3.00	D7						Particle size distribution and sedimentation
						3.50	D8						
20/09/17	DRY C												No groundwater encountered
				103.50	4.00	4.00	B3						Trial pit complete at 4.00m

Pit Stability, Shoring, etc.

No collapse of sides of trial pit

Water Level observations during digging, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min

WATER

- ▼ 1 First Strike
- ▽ 2 Subsequent Strike
- N - Overnight Depth
- C- Completion Depth
- S Seepage not rising

SAMPLE AND TEST KEY

- D Small disturbed sample
- B Bulk disturbed sample
- W Water sample
- U Undisturbed sample
- K Percolation Test
- PP Perth Penetrometer Test
- HV Hand shear vane test
- SRD Sand replacement density test
- CBR In situ CBR test
- PB Plate Bearing Test

TEST RESULT

- Np= Np Value
- V= Average Hand Shear Vane Strength - kN/m^2
- BD= In-Situ Bulk Density - Mg/m^3
- CBR= California Bearing Ratio - %

Fieldwork By	CJS
Dates	20/09/17
Log	CJS/NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Trial Pit Excavation Methods	WHEELED MECHANICAL EXCAVATOR	Hole No.	**TP431**
		Engineer				Sheet	1 of 2
Ground Level	106.00 m.A.O.D.	Coordinates	392647 m.E. 308802 m.N.	Pit Dimensions: Length - 2.30 m	Width - 0.60 m	Job No	**14317GI2**
				Orientation: Length -			

WATER		STRATA				SAMPLING/IN SITU TEST			LAB TESTING				
Date/Time at Depth	Depth to Water m	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Type & No.	Test Result	% < 425	w %	w_P %	w_L %	OTHER TESTS AND NOTES
		Topsoil (Dark brown slightly silty fine-medium sand with some rounded-subrounded fine-coarse quartzite and sandstone gravel and occasional rootlets)		105.70	0.30	0.10	D1						
		Made Ground (Dark brown fine-medium sand with much subangular-well rounded fine-coarse quartzite and sandstone gravel) - possible reworked natural material		105.29	0.71	0.50	D2						BRE SD1 chemical suite
		Made Ground (Brown and dark brown fine-medium sand and subangular-well rounded fine-coarse quartzite and sandstone gravel - reworked natural material)				1.00	D3						
						1.50	B1						
						2.00	D4						BRE SD1 chemical suite
		Brown slightly silty fine-coarse SAND with much subangular-well rounded fine-coarse quartzite and sandstone gravel (Glaciofluvial Deposits)		103.90	2.10	2.40	D5						Particle size distribution
21/09/17	DRY C					2.60	B2						No groundwater encountered
				103.25	2.75								Trial pit complete at 2.75m

Pit Stability, Shoring, etc.

No collapse of sides of trial pit

Water Level observations during digging, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min

WATER

- ▼ 1 First Strike
- ▽ 2 Subsequent Strike
- N - Overnight Depth
- C- Completion Depth
- S Seepage not rising

SAMPLE AND TEST KEY

- D Small disturbed sample
- B Bulk disturbed sample
- W Water sample
- U Undisturbed sample
- K Percolation Test
- PP Perth Penetrometer Test
- HV Hand shear vane test
- SRD Sand replacement density test
- CBR In situ CBR test
- PB Plate Bearing Test

TEST RESULT

- Np= Np Value
- V= Average Hand Shear Vane Strength - kN/m^2
- BD= In-Situ Bulk Density - Mg/m^3
- CBR= California Bearing Ratio - %

Fieldwork By	CJS
Dates	21/09/17
Log	CJS/NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Trial Pit Excavation Methods	WHEELED MECHANICAL EXCAVATOR	Hole No.	**TP433**
		Engineer				Sheet	1 of 2
Ground Level	103.90 m.A.O.D.	Coordinates	392504 m.E. 308696 m.N.	Pit Dimensions: Length - 2.10 m Width - 0.60 m Orientation: Length -		Job No	**14317GI2**

WATER		STRATA				SAMPLING/IN SITU TEST			LAB TESTING				OTHER TESTS AND NOTES
Date/Time at Depth	Depth to Water m	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Type & No.	Test Result	% < 425	w %	w_P %	w_L %	
		Topsoil (Dark brown slightly silty fine-medium sand with a little subangular-rounded fine-coarse quartzite and sandstone gravel and occasional rootlets with rare subangular fine-coarse red brick gravel)		103.63	0.27	0.10	D1						
		Grey brown fine-coarse SAND and subangular-well rounded fine-coarse quartzite and sandstone GRAVEL with occasional cobble size pockets of grey brown clay (Glaciofluvial Deposits)		103.10	0.80	0.50	D2						
		Stiff light grey sandy silty CLAY with coarse gravel size pockets of orangish clayey sand (Till)				0.90	D3						BRE SD1 chemical suite
		Red brown fine-coarse SAND and subangular-rounded fine-coarse quartzite and sandstone GRAVEL (Glaciofluvial Deposits)		102.45	1.45	1.50	D4						
						2.00	B1						
21/09/17	DRY C			101.60	2.30								
		Red brown silty fine-medium SAND with some fine-coarse gravel (Wildmoor Sandstone Formation)		101.50	2.40	2.40	D5						Particle size distribution
													No groundwater encountered
													Trial pit complete at 2.40m

Pit Stability, Shoring, etc.

On completion sides of trial pit collapsed to 2.10m

Water Level observations during digging, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min

WATER

- ▼ 1 First Strike
- ▽ 2 Subsequent Strike
- N - Overnight Depth
- C- Completion Depth
- S Seepage not rising

SAMPLE AND TEST KEY

- D Small disturbed sample
- B Bulk disturbed sample
- W Water sample
- U Undisturbed sample
- K Percolation Test
- PP Perth Penetrometer Test
- HV Hand shear vane test
- SRD Sand replacement density test
- CBR In situ CBR test
- PB Plate Bearing Test

TEST RESULT

- Np= Np Value
- V= Average Hand Shear Vane Strength - kN/m^2
- BD= In-Situ Bulk Density - Mg/m^3
- CBR= California Bearing Ratio - %

Fieldwork By	CJS
Dates	21/09/17
Log	CJS/NAB

RSA GEOTECHNICS LTD

Project	WEST MIDLANDS INTERCHANGE, STAFFORDSHIRE	Client	WALDECK CONSULTING	Trial Pit Excavation Methods	WHEELED MECHANICAL EXCAVATOR	Hole No.	**TP434**
		Engineer				Sheet	1 of 2
Ground Level	105.50 m.A.O.D.	Coordinates	393295 m.E. 308893 m.N.	Pit Dimensions: Length - 2.10 m	Width - 0.60 m	Job No	**14317GI2**
				Orientation: Length -			

WATER		STRATA				SAMPLING/IN SITU TEST			LAB TESTING				
Date/Time at Depth	Depth to Water m	Description	Legend	Level m.A.O.D.	Depth m	Depth m	Type & No.	Test Result	% < 425	w %	w_P %	w_L %	OTHER TESTS AND NOTES
		Topsoil (Dark brown silty fine-medium sand with some subangular-well rounded fine-coarse quartzite gravel and rare rootlets)				0.10	D1						
		Light grey and brown silty very sandy fine-coarse quartzite and sandstone GRAVEL (Glaciofluvial Deposits)		105.16	0.34	0.50	D2						Particle size distribution
		Red brown/light orange and occasionally light brown clayey silty fine-medium SAND with occasional fine gravel (Wildmoor Sandstone Formation)		104.65	0.85	1.00	B1						
		- with occasional layers of light brown fine sand with depth				1.50	D3						Particle size distribution and sedimentation
		- becoming slightly cemented from 1.90m				2.00	D4						
						2.50	B2						
						3.00	D5						
20/09/17	DRY C												No groundwater encountered
				102.00	3.50	3.50	D6						Trial pit complete at 3.50m

Pit Stability, Shoring, etc.
No collapse of sides of trial pit

Water Level observations during digging, depths below GL.					
Strike	Depth Obs.	Depth after 5min	10 min	15 min	20 min

WATER
- ▼ 1 First Strike
- ▽ 2 Subsequent Strike
- N - Overnight Depth
- C- Completion Depth
- S Seepage not rising

SAMPLE AND TEST KEY
- D Small disturbed sample
- B Bulk disturbed sample
- W Water sample
- U Undisturbed sample
- K Percolation Test

- PP Perth Penetrometer Test
- HV Hand shear vane test
- SRD Sand replacement density test
- CBR In situ CBR test
- PB Plate Bearing Test

TEST RESULT
- Np= Np Value
- V= Average Hand Shear Vane Strength - kN/m^2
- BD= In-Situ Bulk Density - Mg/m^3
- CBR= California Bearing Ratio - %

Fieldwork By	CJS
Dates	20/09/17
Log	CJS/NAB

RSA GEOTECHNICS LTD

APPENDIX 3
LABORATORY SOIL ANALYTICAL DATA

Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

Tel: +44 (0) 1244 833780
Fax: +44 (0) 1244 833781

Ramboll Environ UK Ltd
8 The Wharf
Birmingham
B1 2JS

Attention :	Matt Royall
Date :	26th September, 2017
Your reference :	UK15.22306
Our reference :	Test Report 17/15309 Batch 1
Location :	WMI Four Ashes
Date samples received :	13th September, 2017
Status :	Final report
Issue :	1

Seven samples were received for analysis on 13th September, 2017 of which four were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

[redacted]

Simon Gomery BSc
Project Manager

Client Name: Ramboll Environ UK Ltd
Reference: UK15.22306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/15309

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-3	7-9	16-18	19-21							LOD/LOR	Units	Method No.
Sample ID	BH227	BH228	BH230	BH230									
Depth	0.75-0.88	0.60-0.70	0.50-0.60	1.50-2.00									
COC No / misc													
Containers	V J	V J	V J	V J									
Sample Date	11/09/2017	12/09/2017	12/09/2017	12/09/2017									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	13/09/2017	13/09/2017	13/09/2017	13/09/2017									
Arsenic #	2.8	2.9	5.5	1.3							<0.5	mg/kg	TM30/PM15
Beryllium	0.7	<0.5	1.8	<0.5							<0.5	mg/kg	TM30/PM15
Cadmium #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM30/PM15
Chromium #	46.4	38.9	70.9	57.6							<0.5	mg/kg	TM30/PM15
Copper #	5	2	20	4							<1	mg/kg	TM30/PM15
Lead #	15	16	<5	9							<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM30/PM15
Nickel #	9.0	4.0	37.4	7.1							<0.7	mg/kg	TM30/PM15
Selenium #	<1	<1	<1	<1							<1	mg/kg	TM30/PM15
Vanadium	21	13	45	11							<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.5	1.1	0.5	0.2							<0.1	mg/kg	TM74/PM32
Zinc #	24	15	47	10							<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03							<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05							<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	<0.03	<0.03	<0.03							<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	<0.03	<0.03	<0.03							<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	<0.03	<0.03	<0.03							<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	<0.06	<0.06							<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	<0.02	<0.02	<0.02							<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<0.07	<0.07	<0.07							<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	<0.6	<0.6	<0.6							<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	<0.05	<0.05							<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	<0.02	<0.02							<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	95	87	93	87							<0	%	TM4/PM8
Methyl Tertiary Butyl Ether #	-	-	<2	-							<2	ug/kg	TM15/PM10
Benzene #	-	-	<3	-							<3	ug/kg	TM15/PM10
Toluene #	-	-	<3	-							<3	ug/kg	TM15/PM10
Ethylbenzene #	-	-	<3	-							<3	ug/kg	TM15/PM10
p/m-Xylene #	-	-	<5	-							<5	ug/kg	TM15/PM10
o-Xylene #	-	-	<3	-							<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	-	-	109	-							<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	-	-	127	-							<0	%	TM15/PM10

Client Name: Ramboll Environ UK Ltd
Reference: UK15.22306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/15309

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	7-9	16-18	19-21									
Sample ID	BH227	BH228	BH230	BH230									
Depth	0.75-0.88	0.60-0.70	0.50-0.60	1.50-2.00									
COC No / misc													
Containers	V J	V J	V J	V J									
Sample Date	11/09/2017	12/09/2017	12/09/2017	12/09/2017									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	13/09/2017	13/09/2017	13/09/2017	13/09/2017									

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2	<0.2	<0.2							<0.2	mg/kg	TM5/PM16
>C12-C16 #	<4	<4	<4	<4							<4	mg/kg	TM5/PM16
>C16-C21 #	<7	<7	<7	<7							<7	mg/kg	TM5/PM16
>C21-C35 #	<7	<7	<7	<7							<7	mg/kg	TM5/PM16
Total aliphatics C5-35	<19	<19	<19	<19							<19	mg/kg	TM5/TM36/PM12/PM16
Aromatics													
>C5-EC7 #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2	<0.2							<0.2	mg/kg	TM5/PM16
>EC12-EC16 #	<4	<4	<4	<4							<4	mg/kg	TM5/PM16
>EC16-EC21 #	<7	<7	<7	<7							<7	mg/kg	TM5/PM16
>EC21-EC35 #	<7	<7	<7	<7							<7	mg/kg	TM5/PM16
Total aromatics C5-35 #	<19	<19	<19	<19							<19	mg/kg	TM5/TM36/PM12/PM16
Total aliphatics and aromatics(C5-35)	<38	<38	<38	<38							<38	mg/kg	TM5/TM36/PM12/PM16
MTBE #	<5	<5	-	<5							<5	ug/kg	TM31/PM12
Benzene #	<5	<5	-	<5							<5	ug/kg	TM31/PM12
Toluene #	<5	<5	-	<5							<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	<5	-	<5							<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	<5	-	<5							<5	ug/kg	TM31/PM12
o-Xylene #	<5	<5	-	<5							<5	ug/kg	TM31/PM12
Total Phenols HPLC	<0.15	<0.15	<0.15	<0.15							<0.15	mg/kg	TM26/PM21
Natural Moisture Content	8.3	10.9	13.5	23.0							<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3							<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.0128	<0.0015	0.0302	<0.0015							<0.0015	g/l	TM38/PM20
Chromium III	46.4	38.9	70.9	57.6							<0.5	mg/kg	NONE/NONE
Total Cyanide #	<0.5	<0.5	<0.5	<0.5							<0.5	mg/kg	TM89/PM45
pH #	7.72	7.18	7.17	7.29							<0.01	pH units	TM73/PM11

Client Name: Ramboll Environ UK Ltd
Reference: UK15.22306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/15309

VOC Report : **Solid**

J E Sample No.	16-18												
Sample ID	BH230												
Depth	0.50-0.60												
COC No / misc													
Containers	V J												
Sample Date	12/09/2017												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	13/09/2017												

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
VOC MS													
Dichlorodifluoromethane	<2										<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2										<2	ug/kg	TM15/PM10
Chloromethane #	<3										<3	ug/kg	TM15/PM10
Vinyl Chloride	<2										<2	ug/kg	TM15_A/PM10
Bromomethane	<1										<1	ug/kg	TM15/PM10
Chloroethane #	<2										<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	<2										<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6										<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<30										<30	ug/kg	TM15/PM10
trans-1-2-Dichloroethene #	<3										<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3										<3	ug/kg	TM15/PM10
cis-1-2-Dichloroethene #	<3										<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4										<4	ug/kg	TM15/PM10
Bromochloromethane #	<3										<3	ug/kg	TM15/PM10
Chloroform #	<3										<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3										<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3										<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4										<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4										<4	ug/kg	TM15/PM10
Benzene #	<3										<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	<3										<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6										<6	ug/kg	TM15/PM10
Dibromomethane #	<3										<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3										<3	ug/kg	TM15/PM10
cis-1-3-Dichloropropene	<4										<4	ug/kg	TM15/PM10
Toluene #	<3										<3	ug/kg	TM15/PM10
trans-1-3-Dichloropropene	<3										<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3										<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3										<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3										<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3										<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3										<3	ug/kg	TM15/PM10
Chlorobenzene #	<3										<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane	<3										<3	ug/kg	TM15/PM10
Ethylbenzene #	<3										<3	ug/kg	TM15/PM10
p/m-Xylene #	<5										<5	ug/kg	TM15/PM10
o-Xylene #	<3										<3	ug/kg	TM15/PM10
Styrene	<3										<3	ug/kg	TM15_A/PM10
Bromoform	<3										<3	ug/kg	TM15/PM10
Isopropylbenzene #	<3										<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3										<3	ug/kg	TM15/PM10
Bromobenzene	<2										<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4										<4	ug/kg	TM15/PM10
Propylbenzene #	<4										<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3										<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3										<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3										<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5										<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<6										<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4										<4	ug/kg	TM15/PM10
4-Isopropyltoluene #	<4										<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
n-Butylbenzene #	<4										<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane #	<4										<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene #	<7										<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4										<4	ug/kg	TM15/PM10
Naphthalene	<27										<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene #	<7										<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	109										<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	127										<0	%	TM15/PM10

Client Name: Ramboll Environ UK Ltd
Reference: UK15.22306
Location: WMI Four Ashes
Contact: Matt Royall

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
17/15309	1	BH230	0.50-0.60	18	20/09/2017	**General Description (Bulk Analysis)**	Soil/Stones
					20/09/2017	**Asbestos Fibres**	NAD
					20/09/2017	**Asbestos Fibres (2)**	NAD
					20/09/2017	**Asbestos ACM**	NAD
					20/09/2017	**Asbestos ACM (2)**	NAD
					20/09/2017	**Asbestos Type**	NAD
					20/09/2017	**Asbestos Type (2)**	NAD
					20/09/2017	**Asbestos Level Screen**	NAD

Client Name: Ramboll Environ UK Ltd
Reference: UK15.22306
Location: WMI Four Ashes
Contact: Matt Royall

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 17/15309						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 17/15309

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS) accredited - UK.
SA	ISO17025 (SANAS) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 17/15309

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	TM005: Modified USEPA 8015B: Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID. TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID. Including determination of BTEX and calculation of Aliphatic fractions.	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5/TM36	TM005: Modified USEPA 8015B: Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID. TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID. Including determination of BTEX and calculation of Aliphatic fractions.	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid or water samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital shaker.			AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes

JE Job No: 17/15309

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.	Yes		AR	Yes

JE Job No: 17/15309

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	NONE	No Method Code			AR	Yes
TM15_A	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

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Ramboll Environ UK Ltd
8 The Wharf
Birmingham
B1 2JS

Attention :	Matt Royall
Date :	29th September, 2017
Your reference :	UK1522306
Our reference :	Test Report 17/15542 Batch 1
Location :	WM1 Four Ashes
Date samples received :	15th September, 2017
Status :	Final report
Issue :	1

Four samples were received for analysis on 15th September, 2017 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

[redacted]

Simon Gomery BSc
Project Manager

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WM1 Four Ashes
Contact: Matt Royall
JE Job No.: 17/15542

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	2-4	5-7									LOD/LOR	Units	Method No.
Sample ID	BH226	BH226											
Depth	0.70-1.00	1.60-1.80											
COC No / misc													
Containers	V J	V J											
Sample Date	15/09/2017	15/09/2017											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	15/09/2017	15/09/2017											
Arsenic #	1.9	<0.5									<0.5	mg/kg	TM30/PM15
Beryllium	<0.5	0.6									<0.5	mg/kg	TM30/PM15
Cadmium #	<0.1	<0.1									<0.1	mg/kg	TM30/PM15
Chromium #	52.6	41.9									<0.5	mg/kg	TM30/PM15
Copper #	<1	6									<1	mg/kg	TM30/PM15
Lead #	<5	8									<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1									<0.1	mg/kg	TM30/PM15
Nickel #	7.4	6.4									<0.7	mg/kg	TM30/PM15
Selenium #	<1	<1									<1	mg/kg	TM30/PM15
Vanadium	15	11									<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.2	0.4									<0.1	mg/kg	TM74/PM32
Zinc #	11	9									<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03									<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05									<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	<0.03									<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	<0.03									<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	<0.03									<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06									<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	<0.02									<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<0.07									<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	<0.6									<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05									<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02									<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	99	90									<0	%	TM4/PM8
Methyl Tertiary Butyl Ether #	<2	-									<2	ug/kg	TM15/PM10
Benzene #	<3	-									<3	ug/kg	TM15/PM10
Toluene #	<3	-									<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	-									<3	ug/kg	TM15/PM10
p/m-Xylene #	<5	-									<5	ug/kg	TM15/PM10
o-Xylene #	<3	-									<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	111	-									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	136	-									<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WM1 Four Ashes
Contact: Matt Royall
JE Job No.: 17/15542

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	2-4	5-7									LOD/LOR	Units	Method No.
Sample ID	BH226	BH226											
Depth	0.70-1.00	1.60-1.80											
COC No / misc													
Containers	V J	V J											
Sample Date	15/09/2017	15/09/2017											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	15/09/2017	15/09/2017											
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2									<0.2	mg/kg	TM5/PM16
>C12-C16 #	<4	<4									<4	mg/kg	TM5/PM16
>C16-C21 #	<7	<7									<7	mg/kg	TM5/PM16
>C21-C35 #	<7	<7									<7	mg/kg	TM5/PM16
Total aliphatics C5-35	<19	<19									<19	mg/kg	TM5/TM36/PM12/PM16
Aromatics													
>C5-EC7 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2									<0.2	mg/kg	TM5/PM16
>EC12-EC16 #	<4	<4									<4	mg/kg	TM5/PM16
>EC16-EC21 #	<7	<7									<7	mg/kg	TM5/PM16
>EC21-EC35 #	<7	<7									<7	mg/kg	TM5/PM16
Total aromatics C5-35 #	<19	<19									<19	mg/kg	TM5/TM36/PM12/PM16
Total aliphatics and aromatics(C5-35)	<38	<38									<38	mg/kg	TM5/TM36/PM12/PM16
MTBE #	-	<5									<5	ug/kg	TM31/PM12
Benzene #	-	<5									<5	ug/kg	TM31/PM12
Toluene #	-	<5									<5	ug/kg	TM31/PM12
Ethylbenzene #	-	<5									<5	ug/kg	TM31/PM12
m/p-Xylene #	-	<5									<5	ug/kg	TM31/PM12
o-Xylene #	-	<5									<5	ug/kg	TM31/PM12
Total Phenols HPLC	<0.15	<0.15									<0.15	mg/kg	TM26/PM21
Natural Moisture Content	28.1	34.7									<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3									<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.0191	0.0078									<0.0015	g/l	TM38/PM20
Chromium III	52.6	41.9									<0.5	mg/kg	NONE/NONE
Total Cyanide #	<0.5	<0.5									<0.5	mg/kg	TM89/PM45
pH #	7.47	5.58									<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WM1 Four Ashes
Contact: Matt Royall
JE Job No.: 17/15542

VOC Report : **Solid**

J E Sample No.	2-4												
Sample ID	BH226												
Depth	0.70-1.00												
COC No / misc													
Containers	V J												
Sample Date	15/09/2017												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	15/09/2017												

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
VOC MS													
Dichlorodifluoromethane	<2										<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2										<2	ug/kg	TM15/PM10
Chloromethane #	<3										<3	ug/kg	TM15/PM10
Vinyl Chloride	<2										<2	ug/kg	TM15_A/PM10
Bromomethane	<1										<1	ug/kg	TM15/PM10
Chloroethane #	<2										<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	<2										<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6										<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<30										<30	ug/kg	TM15/PM10
trans-1-2-Dichloroethene #	<3										<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3										<3	ug/kg	TM15/PM10
cis-1-2-Dichloroethene #	<3										<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4										<4	ug/kg	TM15/PM10
Bromochloromethane #	<3										<3	ug/kg	TM15/PM10
Chloroform #	<3										<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3										<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3										<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4										<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4										<4	ug/kg	TM15/PM10
Benzene #	<3										<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	<3										<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6										<6	ug/kg	TM15/PM10
Dibromomethane #	<3										<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3										<3	ug/kg	TM15/PM10
cis-1-3-Dichloropropene	<4										<4	ug/kg	TM15/PM10
Toluene #	<3										<3	ug/kg	TM15/PM10
trans-1-3-Dichloropropene	<3										<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3										<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3										<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3										<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3										<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3										<3	ug/kg	TM15/PM10
Chlorobenzene #	<3										<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane	<3										<3	ug/kg	TM15/PM10
Ethylbenzene #	<3										<3	ug/kg	TM15/PM10
p/m-Xylene #	<5										<5	ug/kg	TM15/PM10
o-Xylene #	<3										<3	ug/kg	TM15/PM10
Styrene	<3										<3	ug/kg	TM15_A/PM10
Bromoform	<3										<3	ug/kg	TM15/PM10
Isopropylbenzene #	<3										<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3										<3	ug/kg	TM15/PM10
Bromobenzene	<2										<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4										<4	ug/kg	TM15/PM10
Propylbenzene #	<4										<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3										<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3										<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3										<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5										<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<6										<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4										<4	ug/kg	TM15/PM10
4-Isopropyltoluene #	<4										<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
n-Butylbenzene #	<4										<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane #	<4										<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene #	<7										<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4										<4	ug/kg	TM15/PM10
Naphthalene	<27										<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene #	<7										<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	111										<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	136										<0	%	TM15/PM10

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WM1 Four Ashes
Contact: Matt Royall

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
17/15542	1	BH226	0.20-0.40	1	21/09/2017	**General Description (Bulk Analysis)**	soil/stones
					21/09/2017	**Asbestos Fibres**	NAD
					21/09/2017	**Asbestos Fibres (2)**	NAD
					21/09/2017	**Asbestos ACM**	NAD
					21/09/2017	**Asbestos ACM (2)**	NAD
					21/09/2017	**Asbestos Type**	NAD
					21/09/2017	**Asbestos Type (2)**	NAD
					21/09/2017	**Asbestos Level Screen**	NAD

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WM1 Four Ashes
Contact: Matt Royall

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 17/15542						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 17/15542

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS) accredited - UK.
SA	ISO17025 (SANAS) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 17/15542

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	TM005: Modified USEPA 8015B: Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID. TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID. Including determination of BTEX and calculation of Aliphatic fractions.	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5/TM36	TM005: Modified USEPA 8015B: Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID. TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID. Including determination of BTEX and calculation of Aliphatic fractions.	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid or water samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital shaker.			AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes

JE Job No: 17/15542

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.	Yes		AR	Yes

JE Job No: 17/15542

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	NONE	No Method Code			AR	Yes
TM15_A	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

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Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

Tel: +44 (0) 1244 833780
Fax: +44 (0) 1244 833781

Ramboll Environ UK Ltd
8 The Wharf
Birmingham
B1 2JS

Attention :	Matt Royall
Date :	2nd October, 2017
Your reference :	UK1522306
Our reference :	Test Report 17/15656 Batch 1
Location :	WMI Four Ashes
Date samples received :	19th September, 2017
Status :	Final report
Issue :	1

Five samples were received for analysis on 19th September, 2017 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

[redacted]

Simon Gomery BSc
Project Manager

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/15656

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	10-12											
Sample ID	BH225	BH231											
Depth	0.50-0.70	0.30-0.60											
COC No / misc													
Containers	V J	V J											
Sample Date	18/09/2017	18/09/2017											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	19/09/2017	19/09/2017											

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
Arsenic #	7.1	3.9									<0.5	mg/kg	TM30/PM15
Beryllium	0.9	1.4									<0.5	mg/kg	TM30/PM15
Cadmium #	<0.1	0.1									<0.1	mg/kg	TM30/PM15
Chromium #	63.1	80.8									<0.5	mg/kg	TM30/PM15
Copper #	16	56									<1	mg/kg	TM30/PM15
Lead #	8	57									<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1									<0.1	mg/kg	TM30/PM15
Nickel #	21.4	32.9									<0.7	mg/kg	TM30/PM15
Selenium #	<1	1									<1	mg/kg	TM30/PM15
Vanadium	37	91									<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.6	1.6									<0.1	mg/kg	TM74/PM32
Zinc #	38	175									<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03									<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05									<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	0.41									<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	0.08									<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	0.62									<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	0.53									<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	0.37									<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	0.38									<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	0.55									<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	0.28									<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	0.18									<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	0.05									<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	0.18									<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	3.6									<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	0.40									<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	0.15									<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	97	96									<0	%	TM4/PM8

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/15656

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-3	10-12									LOD/LOR	Units	Method No.
Sample ID	BH225	BH231											
Depth	0.50-0.70	0.30-0.60											
COC No / misc													
Containers	V J	V J											
Sample Date	18/09/2017	18/09/2017											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	19/09/2017	19/09/2017											
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C6-C8 #	0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2									<0.2	mg/kg	TM5/PM16
>C12-C16 #	<4	<4									<4	mg/kg	TM5/PM16
>C16-C21 #	<7	<7									<7	mg/kg	TM5/PM16
>C21-C35 #	<7	8									<7	mg/kg	TM5/PM16
Total aliphatics C5-35	<19	<19									<19	mg/kg	TM5/TM36/PM12/PM16
Aromatics													
>C5-EC7 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2									<0.2	mg/kg	TM5/PM16
>EC12-EC16 #	<4	<4									<4	mg/kg	TM5/PM16
>EC16-EC21 #	<7	14									<7	mg/kg	TM5/PM16
>EC21-EC35 #	<7	58									<7	mg/kg	TM5/PM16
Total aromatics C5-35 #	<19	72									<19	mg/kg	TM5/TM36/PM12/PM16
Total aliphatics and aromatics(C5-35)	<38	72									<38	mg/kg	TM5/TM36/PM12/PM16
MTBE #	<5	<5									<5	ug/kg	TM31/PM12
Benzene #	<5	<5									<5	ug/kg	TM31/PM12
Toluene #	<5	<5									<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	<5									<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	<5									<5	ug/kg	TM31/PM12
o-Xylene #	<5	<5									<5	ug/kg	TM31/PM12
Total Phenols HPLC	0.22	<0.15									<0.15	mg/kg	TM26/PM21
Natural Moisture Content	12.6	11.7									<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3									<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	<0.0015	0.0566									<0.0015	g/l	TM38/PM20
Chromium III	63.1	80.8									<0.5	mg/kg	NONE/NONE
Total Cyanide #	<0.5	<0.5									<0.5	mg/kg	TM89/PM45
Fraction Organic Carbon	-	0.012									<0.001	None	TM21/PM24
pH #	7.57	8.40									<0.01	pH units	TM73/PM11

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
17/15656	1	BH225	0.50-0.70	3	25/09/2017	**General Description (Bulk Analysis)**	Soil/Stone
					25/09/2017	**Asbestos Fibres**	NAD
					25/09/2017	**Asbestos Fibres (2)**	NAD
					25/09/2017	**Asbestos ACM**	NAD
					25/09/2017	**Asbestos ACM (2)**	NAD
					25/09/2017	**Asbestos Type**	NAD
					25/09/2017	**Asbestos Type (2)**	NAD
					25/09/2017	**Asbestos Level Screen**	NAD
17/15656	1	BH231	0.30-0.60	12	25/09/2017	**General Description (Bulk Analysis)**	Soil/Stone
					25/09/2017	**Asbestos Fibres**	NAD
					25/09/2017	**Asbestos Fibres (2)**	NAD
					25/09/2017	**Asbestos ACM**	NAD
					25/09/2017	**Asbestos ACM (2)**	NAD
					25/09/2017	**Asbestos Type**	NAD
					25/09/2017	**Asbestos Type (2)**	NAD
					25/09/2017	**Asbestos Level Screen**	NAD

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 17/15656						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 17/15656

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

ABBREVIATIONS and ACRONYMS USED

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NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 17/15656

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	TM005: Modified USEPA 8015B: Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID. TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID. Including determination of BTEX and calculation of Aliphatic fractions	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5/TM36	TM005: Modified USEPA 8015B: Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID. TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID. Including determination of BTEX and calculation of Aliphatic fractions	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM21	Modified USEPA 415.1. Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid or water samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital shaker.			AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes

JE Job No: 17/15656

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.	Yes		AR	Yes
NONE	No Method Code	NONE	No Method Code			AR	Yes

Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

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Ramboll Environ UK Ltd
8 The Wharf
Birmingham
B1 2JS

Attention :	Matt Royall
Date :	10th October, 2017
Your reference :	UK1522306
Our reference :	Test Report 17/15687 Batch 1
Location :	WM1 FourAshes
Date samples received :	20th September, 2017
Status :	Final report
Issue :	1

Four samples were received for analysis on 20th September, 2017 of which four were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

[redacted]

Paul Boden BSc
Project Manager

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WM1 FourAshes
Contact: Matt Royall
JE Job No.: 17/15687

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-6	7-9	10-12							LOD/LOR	Units	Method No.
Sample ID	BH231	BH229	BH229	BH229									
Depth	4.10-4.50	0.50-0.70	1.00-1.50	3.20-3.40									
COC No / misc													
Containers	V J	V J	V J B	V J									
Sample Date	19/09/2017	19/09/2017	19/09/2017	19/09/2017									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	20/09/2017	20/09/2017	20/09/2017	20/09/2017									
Arsenic #	2.0	-	NDP	3.9							<0.5	mg/kg	TM30/PM15
Beryllium	0.7	-	NDP	0.6							<0.5	mg/kg	TM30/PM15
Cadmium #	<0.1	-	NDP	<0.1							<0.1	mg/kg	TM30/PM15
Chromium #	38.2	-	NDP	54.4							<0.5	mg/kg	TM30/PM15
Copper #	262_{AA}	-	NDP	24							<1	mg/kg	TM30/PM15
Lead #	<5	-	NDP	12							<5	mg/kg	TM30/PM15
Mercury #	<0.1	-	NDP	<0.1							<0.1	mg/kg	TM30/PM15
Nickel #	9.9	-	NDP	12.3							<0.7	mg/kg	TM30/PM15
Selenium #	<1	-	NDP	<1							<1	mg/kg	TM30/PM15
Vanadium	16	-	NDP	19							<1	mg/kg	TM30/PM15
Water Soluble Boron #	<0.1	-	NDP	<0.1							<0.1	mg/kg	TM74/PM32
Zinc #	29	-	NDP	33							<5	mg/kg	TM30/PM15
Arsenic	-	-	15.7	-							<0.5	mg/kg	TM30/PM62
Beryllium	-	-	2.2	-							<0.5	mg/kg	TM30/PM62
Cadmium	-	-	1.3	-							<0.1	mg/kg	TM30/PM62
Chromium	-	-	25.1	-							<0.5	mg/kg	TM30/PM62
Copper	-	-	226	-							<1	mg/kg	TM30/PM62
Lead	-	-	133	-							<5	mg/kg	TM30/PM62
Mercury	-	-	<0.1	-							<0.1	mg/kg	TM30/PM62
Nickel	-	-	35.8	-							<0.7	mg/kg	TM30/PM62
Selenium	-	-	<1	-							<1	mg/kg	TM30/PM62
Vanadium	-	-	37	-							<1	mg/kg	TM30/PM62
Water Soluble Boron	-	-	6.4	-							<0.1	mg/kg	TM74/PM61
Zinc	-	-	413	-							<5	mg/kg	TM30/PM62

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WM1 FourAshes
Contact: Matt Royall
JE Job No.: 17/15687

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-6	7-9	10-12							LOD/LOR	Units	Method No.
Sample ID	BH231	BH229	BH229	BH229									
Depth	4.10-4.50	0.50-0.70	1.00-1.50	3.20-3.40									
COC No / misc													
Containers	V J	V J	V J B	V J									
Sample Date	19/09/2017	19/09/2017	19/09/2017	19/09/2017									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	20/09/2017	20/09/2017	20/09/2017	20/09/2017									
PAH MS													
Naphthalene #	<0.04	-	0.07	<0.04							<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	-	0.08	<0.03							<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	-	0.11	<0.05							<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	-	0.11	<0.04							<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	-	0.83	0.07							<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	-	0.28	<0.04							<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	-	1.86	0.06							<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	-	1.52	0.05							<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	-	1.02	<0.06							<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	-	0.91	<0.02							<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	-	1.97	<0.07							<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	-	1.07	<0.04							<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	-	0.70	<0.04							<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	-	0.14	<0.04							<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	-	0.62	<0.04							<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	-	11.3	<0.6							<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	-	1.42	<0.05							<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	-	0.55	<0.02							<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	79	-	72	72							<0	%	TM4/PM8
Methyl Tertiary Butyl Ether #	-	-	<2	-							<2	ug/kg	TM15/PM10
Benzene #	-	-	4	-							<3	ug/kg	TM15/PM10
Toluene #	-	-	8	-							<3	ug/kg	TM15/PM10
Ethylbenzene #	-	-	<3	-							<3	ug/kg	TM15/PM10
p/m-Xylene #	-	-	8	-							<5	ug/kg	TM15/PM10
o-Xylene #	-	-	5	-							<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	-	-	85	-							<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	-	-	62	-							<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WM1 FourAshes
Contact: Matt Royall
JE Job No.: 17/15687

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-6	7-9	10-12							LOD/LOR	Units	Method No.
Sample ID	BH231	BH229	BH229	BH229									
Depth	4.10-4.50	0.50-0.70	1.00-1.50	3.20-3.40									
COC No / misc													
Containers	V J	V J	V J B	V J									
Sample Date	19/09/2017	19/09/2017	19/09/2017	19/09/2017									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	20/09/2017	20/09/2017	20/09/2017	20/09/2017									
Pesticides													
Organochlorine Pesticides													
Aldrin	-	<10	-	-							<10	ug/kg	TM42/PM8
Alpha-HCH (BHC)	-	<10	-	-							<10	ug/kg	TM42/PM8
Beta-HCH (BHC)	-	<10	-	-							<10	ug/kg	TM42/PM8
Delta-HCH (BHC)	-	<10	-	-							<10	ug/kg	TM42/PM8
Dieldrin	-	<10	-	-							<10	ug/kg	TM42/PM8
Endosulphan I	-	<10	-	-							<10	ug/kg	TM42/PM8
Endosulphan II	-	<10	-	-							<10	ug/kg	TM42/PM8
Endosulphan sulphate	-	<10	-	-							<10	ug/kg	TM42/PM8
Endrin	-	<10	-	-							<10	ug/kg	TM42/PM8
Gamma-HCH (BHC)	-	<10	-	-							<10	ug/kg	TM42/PM8
Heptachlor	-	<10	-	-							<10	ug/kg	TM42/PM8
Heptachlor Epoxide	-	<10	-	-							<10	ug/kg	TM42/PM8
p,p'-DDE	-	<10	-	-							<10	ug/kg	TM42/PM8
p,p'-DDT	-	<10	-	-							<10	ug/kg	TM42/PM8
p,p'-TDE	-	<10	-	-							<10	ug/kg	TM42/PM8
Total Methoxychlor	-	<10	-	-							<10	ug/kg	TM42/PM8
Organophosphorus Pesticides													
Azinphos methyl	-	<10	-	-							<10	ug/kg	TM42/PM8
Diazinon	-	<10	-	-							<10	ug/kg	TM42/PM8
Dichlorvos	-	<10	-	-							<10	ug/kg	TM42/PM8
Disulfoton	-	<10	-	-							<10	ug/kg	TM42/PM8
Ethion	-	<10	-	-							<10	ug/kg	TM42/PM8
Ethyl Parathion (Parathion)	-	<10	-	-							<10	ug/kg	TM42/PM8
Fenitrothion	-	<10	-	-							<10	ug/kg	TM42/PM8
Malathion	-	<10	-	-							<10	ug/kg	TM42/PM8
Methyl Parathion	-	<10	-	-							<10	ug/kg	TM42/PM8
Mevinphos	-	<10	-	-							<10	ug/kg	TM42/PM8
2,3,6 - TBA	-	<0.1	-	-							<0.1	mg/kg	TM42/PM8
2,4 - D	-	<0.1	-	-							<0.1	mg/kg	TM42/PM8
2,4 - DB	-	<0.1	-	-							<0.1	mg/kg	TM42/PM8
2,4,5 - T	-	<0.1	-	-							<0.1	mg/kg	TM42/PM8
4 - CPA	-	<0.1	-	-							<0.1	mg/kg	TM42/PM8
Benazolin	-	<0.1	-	-							<0.1	mg/kg	TM42/PM8
Bentazone	-	<0.1	-	-							<0.1	mg/kg	TM42/PM8
Bromoxynil	-	<0.1	-	-							<0.1	mg/kg	TM42/PM8
Clopyralid	-	<0.1	-	-							<0.1	mg/kg	TM42/PM8
Dicamba	-	<0.1	-	-							<0.1	mg/kg	TM42/PM8
Dichloroprop	-	<0.1	-	-							<0.1	mg/kg	TM42/PM8
Diclofop	-	<0.1	-	-							<0.1	mg/kg	TM42/PM8
Fenoprop	-	<0.1	-	-							<0.1	mg/kg	TM42/PM8
Flamprop	-	<0.1	-	-							<0.1	mg/kg	TM42/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WM1 FourAshes
Contact: Matt Royall
JE Job No.: 17/15687

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-6	7-9	10-12							LOD/LOR	Units	Method No.
Sample ID	BH231	BH229	BH229	BH229									
Depth	4.10-4.50	0.50-0.70	1.00-1.50	3.20-3.40									
COC No / misc													
Containers	V J	V J	V J B	V J									
Sample Date	19/09/2017	19/09/2017	19/09/2017	19/09/2017									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	20/09/2017	20/09/2017	20/09/2017	20/09/2017									
Flamprop – isopropyl	-	<0.1	-	-							<0.1	mg/kg	TM42/PM8
Ioxynil	-	<0.1	-	-							<0.1	mg/kg	TM42/PM8
MCPA	-	<0.1	-	-							<0.1	mg/kg	TM42/PM8
MCPB	-	<0.1	-	-							<0.1	mg/kg	TM42/PM8
Mecoprop	-	<0.1	-	-							<0.1	mg/kg	TM42/PM8
Pentachlorophenol	-	<0.1	-	-							<0.1	mg/kg	TM42/PM8
Picloram	-	<0.1	-	-							<0.1	mg/kg	TM42/PM8
Triclopyr	-	<0.1	-	-							<0.1	mg/kg	TM42/PM8
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	-	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	-	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	-	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	-	<0.2	<0.2							<0.2	mg/kg	TM5/PM16
>C12-C16 #	<4	-	7	<4							<4	mg/kg	TM5/PM16
>C16-C21 #	<7	-	23	<7							<7	mg/kg	TM5/PM16
>C21-C35 #	<7	-	102	<7							<7	mg/kg	TM5/PM16
Total aliphatics C5-35	<19	-	132	<19							<19	mg/kg	TM5/TM36/PM12/PM16
Aromatics													
>C5-EC7 #	<0.1	-	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	-	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	-	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	-	<0.2	<0.2							<0.2	mg/kg	TM5/PM16
>EC12-EC16 #	<4	-	9	<4							<4	mg/kg	TM5/PM16
>EC16-EC21 #	<7	-	46	12							<7	mg/kg	TM5/PM16
>EC21-EC35 #	<7	-	187	23							<7	mg/kg	TM5/PM16
Total aromatics C5-35 #	<19	-	242	35							<19	mg/kg	TM5/TM36/PM12/PM16
Total aliphatics and aromatics(C5-35)	<38	-	374	<38							<38	mg/kg	TM5/TM36/PM12/PM16
MTBE #	<5	-	-	<5							<5	ug/kg	TM31/PM12
Benzene #	<5	-	-	<5							<5	ug/kg	TM31/PM12
Toluene #	<5	-	-	<5							<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	-	-	<5							<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	-	-	<5							<5	ug/kg	TM31/PM12
o-Xylene #	<5	-	-	<5							<5	ug/kg	TM31/PM12
Total Phenols HPLC	<0.15	-	<0.15	<0.15							<0.15	mg/kg	TM26/PM21
Natural Moisture Content	28.2	19.3	NDP	12.6							<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	-	<0.3	<0.3							<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.0216	-	NDP	0.0161							<0.0015	g/l	TM38/PM20
Sulphate as SO4 (2:1 Ext)	-	-	0.1267	-							<0.0015	g/l	TM38/PM60

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WM1 FourAshes
Contact: Matt Royall
JE Job No.: 17/15687

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-6	7-9	10-12							LOD/LOR	Units	Method No.
Sample ID	BH231	BH229	BH229	BH229									
Depth	4.10-4.50	0.50-0.70	1.00-1.50	3.20-3.40									
COC No / misc													
Containers	V J	V J	V J B	V J									
Sample Date	19/09/2017	19/09/2017	19/09/2017	19/09/2017									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	20/09/2017	20/09/2017	20/09/2017	20/09/2017									
Chromium III	38.2	-	NDP	54.4							<0.5	mg/kg	NONE/NONE
Chromium III	-	-	25.1	-							<0.5	mg/kg	NONE/NONE
Total Cyanide #	<0.5	-	<0.5	<0.5							<0.5	mg/kg	TM89/PM45
pH #	8.06	-	7.96	7.40							<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WM1 FourAshes
Contact: Matt Royall
JE Job No.: 17/15687

SVOC Report : **Solid**

J E Sample No.	7-9												
Sample ID	BH229												
Depth	1.00-1.50										Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V J B												
Sample Date	19/09/2017												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	20/09/2017										LOD/LOR	Units	Method No.
SVOC MS													
Phenols													
2-Chlorophenol #	<10										<10	ug/kg	TM16/PM8
2-Methylphenol	<10										<10	ug/kg	TM16/PM8
2-Nitrophenol	<10										<10	ug/kg	TM16/PM8
2,4-Dichlorophenol #	<10										<10	ug/kg	TM16/PM8
2,4-Dimethylphenol	<10										<10	ug/kg	TM16/PM8
2,4,5-Trichlorophenol	<10										<10	ug/kg	TM16/PM8
2,4,6-Trichlorophenol	<10										<10	ug/kg	TM16/PM8
4-Chloro-3-methylphenol	<10										<10	ug/kg	TM16/PM8
4-Methylphenol	<10										<10	ug/kg	TM16/PM8
4-Nitrophenol	<10										<10	ug/kg	TM16/PM8
Pentachlorophenol	<10										<10	ug/kg	TM16/PM8
Phenol #	<10										<10	ug/kg	TM16/PM8
PAHs													
2-Chloronaphthalene #	<10										<10	ug/kg	TM16/PM8
2-Methylnaphthalene #	40										<10	ug/kg	TM16/PM8
Phthalates													
Bis(2-ethylhexyl) phthalate	<100										<100	ug/kg	TM16/PM8
Butylbenzyl phthalate	<100										<100	ug/kg	TM16/PM8
Di-n-butyl phthalate	<100										<100	ug/kg	TM16/PM8
Di-n-Octyl phthalate	<100										<100	ug/kg	TM16/PM8
Diethyl phthalate	<100										<100	ug/kg	TM16/PM8
Dimethyl phthalate #	<100										<100	ug/kg	TM16/PM8
Other SVOCs													
1,2-Dichlorobenzene	<10										<10	ug/kg	TM16/PM8
1,2,4-Trichlorobenzene #	<10										<10	ug/kg	TM16/PM8
1,3-Dichlorobenzene	<10										<10	ug/kg	TM16/PM8
1,4-Dichlorobenzene	<10										<10	ug/kg	TM16/PM8
2-Nitroaniline	<10										<10	ug/kg	TM16/PM8
2,4-Dinitrotoluene	<10										<10	ug/kg	TM16/PM8
2,6-Dinitrotoluene	<10										<10	ug/kg	TM16/PM8
3-Nitroaniline	<10										<10	ug/kg	TM16/PM8
4-Bromophenylphenylether #	<10										<10	ug/kg	TM16/PM8
4-Chloroaniline	<10										<10	ug/kg	TM16/PM8
4-Chlorophenylphenylether	<10										<10	ug/kg	TM16/PM8
4-Nitroaniline	<10										<10	ug/kg	TM16/PM8
Azobenzene	<10										<10	ug/kg	TM16/PM8
Bis(2-chloroethoxy)methane	<10										<10	ug/kg	TM16/PM8
Bis(2-chloroethyl)ether	<10										<10	ug/kg	TM16/PM8
Carbazole	75										<10	ug/kg	TM16/PM8
Dibenzofuran #	91										<10	ug/kg	TM16/PM8
Hexachlorobenzene	<10										<10	ug/kg	TM16/PM8
Hexachlorobutadiene #	<10										<10	ug/kg	TM16/PM8
Hexachlorocyclopentadiene	<10										<10	ug/kg	TM16/PM8
Hexachloroethane	<10										<10	ug/kg	TM16/PM8
Isophorone #	<10										<10	ug/kg	TM16/PM8
N-nitrosodi-n-propylamine #	<10										<10	ug/kg	TM16/PM8
Nitrobenzene #	<10										<10	ug/kg	TM16/PM8
Surrogate Recovery 2-Fluorobiphenyl	86										<0	%	TM16/PM8
Surrogate Recovery p-Terphenyl-d14	93										<0	%	TM16/PM8

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WM1 FourAshes
Contact: Matt Royall
JE Job No.: 17/15687

VOC Report : **Solid**

J E Sample No.	7-9												
Sample ID	BH229												
Depth	1.00-1.50												
COC No / misc													
Containers	V J B												
Sample Date	19/09/2017												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	20/09/2017												

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
VOC MS													
Dichlorodifluoromethane	<2										<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2										<2	ug/kg	TM15/PM10
Chloromethane #	<3										<3	ug/kg	TM15/PM10
Vinyl Chloride	<2										<2	ug/kg	TM15_A/PM10
Bromomethane	<1										<1	ug/kg	TM15/PM10
Chloroethane #	<2										<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	<2										<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6										<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<30										<30	ug/kg	TM15/PM10
trans-1-2-Dichloroethene #	<3										<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3										<3	ug/kg	TM15/PM10
cis-1-2-Dichloroethene #	<3										<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4										<4	ug/kg	TM15/PM10
Bromochloromethane #	<3										<3	ug/kg	TM15/PM10
Chloroform #	<3										<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3										<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3										<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4										<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4										<4	ug/kg	TM15/PM10
Benzene #	4										<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	<3										<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6										<6	ug/kg	TM15/PM10
Dibromomethane #	<3										<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3										<3	ug/kg	TM15/PM10
cis-1-3-Dichloropropene	<4										<4	ug/kg	TM15/PM10
Toluene #	8										<3	ug/kg	TM15/PM10
trans-1-3-Dichloropropene	<3										<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3										<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3										<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3										<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3										<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3										<3	ug/kg	TM15/PM10
Chlorobenzene #	<3										<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane	<3										<3	ug/kg	TM15/PM10
Ethylbenzene #	<3										<3	ug/kg	TM15/PM10
p/m-Xylene #	8										<5	ug/kg	TM15/PM10
o-Xylene #	5										<3	ug/kg	TM15/PM10
Styrene	<3										<3	ug/kg	TM15_A/PM10
Bromoform	<3										<3	ug/kg	TM15/PM10
Isopropylbenzene #	<3										<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3										<3	ug/kg	TM15/PM10
Bromobenzene	<2										<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4										<4	ug/kg	TM15/PM10
Propylbenzene #	<4										<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3										<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3										<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3										<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5										<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	8										<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4										<4	ug/kg	TM15/PM10
4-Isopropyltoluene #	<4										<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
n-Butylbenzene #	<4										<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane #	<4										<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene #	<7										<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4										<4	ug/kg	TM15/PM10
Naphthalene	63										<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene #	<7										<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	85										<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	62										<0	%	TM15/PM10

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WM1 FourAshes
Contact: Matt Royall

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
17/15687	1	BH229	1.00-1.50	8	26/09/2017	**General Description (Bulk Analysis)**	Soil/Stone
					26/09/2017	**Asbestos Fibres**	Fibre Bundles
					26/09/2017	**Asbestos ACM**	NAD
					26/09/2017	**Asbestos Type**	Chrysotile
					26/09/2017	**Asbestos Level Screen**	less than 0.1%

Client Name: Ramboll Environ UK Ltd

Reference: UK1522306

Location: WM1 FourAshes

Contact: Matt Royall

Matrix : Solid

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	NDP Reason
17/15687	1	BH229	1.00-1.50	7-9	Asbestos detected in sample

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WM1 FourAshes
Contact: Matt Royall

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 17/15687						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 17/15687

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS) accredited - UK.
SA	ISO17025 (SANAS) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution

JE Job No: 17/15687

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	TM005: Modified USEPA 8015B: Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID. TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID. Including determination of BTEX and calculation of Aliphatic fractions	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5/TM36	TM005: Modified USEPA 8015B: Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID. TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID. Including determination of BTEX and calculation of Aliphatic fractions	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes

JE Job No: 17/15687

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid or water samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital shaker.			AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM62	Acid digestion of as received solid samples using Aqua Regia refluxed at 112.5 °C.			AR	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM60	As received solid samples are extracted with deionised water in a 2:1 ratio of water to solid.			AR	Yes

JE Job No: 17/15687

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM42	Modified US EPA method 8270. Pesticides and herbicdes by GC-MS	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM61	As received solid samples are extracted with hot water in a 20:1 ratio of water to soil ready for analysis by ICP.			AR	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.	Yes		AR	Yes
NONE	No Method Code	NONE	No Method Code			AR	Yes
TM15_A	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

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Ramboll Environ UK Ltd
8 The Wharf
Birmingham
B1 2JS

Attention :	Matt Royall
Date :	4th October, 2017
Your reference :	UK1522306
Our reference :	Test Report 17/15768 Batch 1
Location :	WMI Four Ashes
Date samples received :	21st September, 2017
Status :	Final report
Issue :	1

Twenty four samples were received for analysis on 21st September, 2017 of which eight were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

[redacted]

Simon Gomery BSc
Project Manager

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/15768

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	13	20-22	30	37-38	42-44	48-50	54-56				LOD/LOR	Units	Method No.
Sample ID	TP434	TP428	TP429	TP427	TP430	TP426	BH233						
Depth	0.10-0.30	0.60-0.85	0.50-0.70	0.50-0.70	0.60-0.80	0.10-0.20	0.60-0.80						
COC No / misc													
Containers	V	V J	V	V J	V J	V J	V J						
Sample Date	20/09/2017	20/09/2017	20/09/2017	20/09/2017	20/09/2017	20/09/2017	20/09/2017						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017						
Arsenic #	1.7	9.2	5.4	4.2	3.0	8.2	6.7				<0.5	mg/kg	TM30/PM15
Beryllium	<0.5	0.9	0.5	0.7	<0.5	1.0	1.0				<0.5	mg/kg	TM30/PM15
Cadmium #	<0.1	0.3	<0.1	<0.1	<0.1	0.7	<0.1				<0.1	mg/kg	TM30/PM15
Chromium #	110.0	59.5	37.4	40.2	52.8	52.2	58.3				<0.5	mg/kg	TM30/PM15
Copper #	6	49	4	3	5	21	17				<1	mg/kg	TM30/PM15
Lead #	13	34	<5	<5	6	72	20				<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1				<0.1	mg/kg	TM30/PM15
Nickel #	6.4	22.8	4.8	7.3	8.2	14.3	19.6				<0.7	mg/kg	TM30/PM15
Selenium #	<1	<1	<1	<1	<1	<1	<1				<1	mg/kg	TM30/PM15
Vanadium	9	24	16	20	17	18	26				<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.3	1.0	<0.1	<0.1	0.2	0.6	0.6				<0.1	mg/kg	TM74/PM32
Zinc #	18	105	6	9	12	99	115				<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04				<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03				<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	<0.05				<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	0.06	<0.04	<0.04	<0.04	<0.04	<0.04				<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	0.52	<0.03	<0.03	<0.03	<0.03	0.04				<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	0.09	<0.04	<0.04	<0.04	<0.04	<0.04				<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.04	0.58	<0.03	<0.03	<0.03	0.07	0.10				<0.03	mg/kg	TM4/PM8
Pyrene #	0.04	0.50	<0.03	<0.03	<0.03	0.07	0.08				<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	0.29	<0.06	<0.06	<0.06	<0.06	<0.06				<0.06	mg/kg	TM4/PM8
Chrysene #	0.03	0.33	<0.02	<0.02	<0.02	0.06	0.06				<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	0.53	<0.07	<0.07	<0.07	0.11	0.11				<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	0.32	<0.04	<0.04	<0.04	0.06	0.06				<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	0.18	<0.04	<0.04	<0.04	<0.04	<0.04				<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04				<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	0.19	<0.04	<0.04	<0.04	<0.04	<0.04				<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	3.7	<0.6	<0.6	<0.6	<0.6	<0.6				<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	0.38	<0.05	<0.05	<0.05	0.08	0.08				<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	0.15	<0.02	<0.02	<0.02	0.03	0.03				<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	90	86	90	86	97	90	96				<0	%	TM4/PM8
Methyl Tertiary Butyl Ether #	-	<2	-	-	-	-	-				<2	ug/kg	TM15/PM10
Benzene #	-	<3	-	-	-	-	-				<3	ug/kg	TM15/PM10
Toluene #	-	<3	-	-	-	-	-				<3	ug/kg	TM15/PM10
Ethylbenzene #	-	<3	-	-	-	-	-				<3	ug/kg	TM15/PM10
p/m-Xylene #	-	<5	-	-	-	-	-				<5	ug/kg	TM15/PM10
o-Xylene #	-	<3	-	-	-	-	-				<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	-	89	-	-	-	-	-				<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	-	84	-	-	-	-	-				<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/15768

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	13	20-22	30	37-38	42-44	48-50	54-56				LOD/LOR	Units	Method No.
Sample ID	TP434	TP428	TP429	TP427	TP430	TP426	BH233						
Depth	0.10-0.30	0.60-0.85	0.50-0.70	0.50-0.70	0.60-0.80	0.10-0.20	0.60-0.80						
COC No / misc													
Containers	V	V J	V	V J	V J	V J	V J						
Sample Date	20/09/2017	20/09/2017	20/09/2017	20/09/2017	20/09/2017	20/09/2017	20/09/2017						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017						
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1				<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2				<0.2	mg/kg	TM5/PM16
>C12-C16 #	<4	<4	<4	<4	<4	<4	<4				<4	mg/kg	TM5/PM16
>C16-C21 #	<7	<7	<7	<7	<7	<7	<7				<7	mg/kg	TM5/PM16
>C21-C35 #	<7	<7	<7	<7	<7	<7	<7				<7	mg/kg	TM5/PM16
Total aliphatics C5-35	<19	<19	<19	<19	<19	<19	<19				<19	mg/kg	TM5/TM36/PM12/PM16
Aromatics													
>C5-EC7 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2				<0.2	mg/kg	TM5/PM16
>EC12-EC16 #	<4	<4	<4	<4	<4	<4	<4				<4	mg/kg	TM5/PM16
>EC16-EC21 #	<7	<7	<7	<7	<7	<7	<7				<7	mg/kg	TM5/PM16
>EC21-EC35 #	<7	<7	<7	<7	<7	<7	<7				<7	mg/kg	TM5/PM16
Total aromatics C5-35 #	<19	<19	<19	<19	<19	<19	<19				<19	mg/kg	TM5/TM36/PM12/PM16
Total aliphatics and aromatics(C5-35)	<38	<38	<38	<38	<38	<38	<38				<38	mg/kg	TM5/TM36/PM12/PM16
MTBE #	<5	-	<5	<5	<5	<5	<5				<5	ug/kg	TM31/PM12
Benzene #	<5	-	<5	<5	<5	<5	<5				<5	ug/kg	TM31/PM12
Toluene #	<5	-	<5	<5	<5	<5	<5				<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	-	<5	<5	<5	<5	<5				<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	-	<5	<5	<5	<5	<5				<5	ug/kg	TM31/PM12
o-Xylene #	<5	-	<5	<5	<5	<5	<5				<5	ug/kg	TM31/PM12
Total Phenols HPLC	NDP	<0.15	NDP	<0.15	<0.15	<0.15	<0.15				<0.15	mg/kg	TM26/PM21
Natural Moisture Content	5.2	19.4	14.2	21.7	5.5	17.7	12.4				<0.1	%	PM4/PM0
Hexavalent Chromium #	NDP	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3				<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	<0.0015	1.5590	<0.0015	0.0216	<0.0015	0.0051	0.0169				<0.0015	g/l	TM38/PM20
Chromium III	NDP	59.5	37.4	40.2	52.8	52.2	58.3				<0.5	mg/kg	NONE/NONE
Total Cyanide #	0.6	<0.5	<0.5	<0.5	<0.5	0.7	<0.5				<0.5	mg/kg	TM89/PM45
pH #	NDP	7.80	NDP	6.65	6.84	6.20	8.10				<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/15768

SVOC Report : **Solid**

J E Sample No.	20-22												
Sample ID	TP428												
Depth	0.60-0.85												
COC No / misc													
Containers	V J												
Sample Date	20/09/2017												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	21/09/2017												

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
SVOC MS													
Phenols													
2-Chlorophenol #	<10										<10	ug/kg	TM16/PM8
2-Methylphenol	<10										<10	ug/kg	TM16/PM8
2-Nitrophenol	<10										<10	ug/kg	TM16/PM8
2,4-Dichlorophenol #	<10										<10	ug/kg	TM16/PM8
2,4-Dimethylphenol	<10										<10	ug/kg	TM16/PM8
2,4,5-Trichlorophenol	<10										<10	ug/kg	TM16/PM8
2,4,6-Trichlorophenol	<10										<10	ug/kg	TM16/PM8
4-Chloro-3-methylphenol	<10										<10	ug/kg	TM16/PM8
4-Methylphenol	<10										<10	ug/kg	TM16/PM8
4-Nitrophenol	<10										<10	ug/kg	TM16/PM8
Pentachlorophenol	<10										<10	ug/kg	TM16/PM8
Phenol #	<10										<10	ug/kg	TM16/PM8
PAHs													
2-Chloronaphthalene #	<10										<10	ug/kg	TM16/PM8
2-Methylnaphthalene #	<10										<10	ug/kg	TM16/PM8
Phthalates													
Bis(2-ethylhexyl) phthalate	<100										<100	ug/kg	TM16/PM8
Butylbenzyl phthalate	<100										<100	ug/kg	TM16/PM8
Di-n-butyl phthalate	<100										<100	ug/kg	TM16/PM8
Di-n-Octyl phthalate	<100										<100	ug/kg	TM16/PM8
Diethyl phthalate	<100										<100	ug/kg	TM16/PM8
Dimethyl phthalate #	<100										<100	ug/kg	TM16/PM8
Other SVOCs													
1,2-Dichlorobenzene	<10										<10	ug/kg	TM16/PM8
1,2,4-Trichlorobenzene #	<10										<10	ug/kg	TM16/PM8
1,3-Dichlorobenzene	<10										<10	ug/kg	TM16/PM8
1,4-Dichlorobenzene	<10										<10	ug/kg	TM16/PM8
2-Nitroaniline	<10										<10	ug/kg	TM16/PM8
2,4-Dinitrotoluene	<10										<10	ug/kg	TM16/PM8
2,6-Dinitrotoluene	<10										<10	ug/kg	TM16/PM8
3-Nitroaniline	<10										<10	ug/kg	TM16/PM8
4-Bromophenylphenylether #	<10										<10	ug/kg	TM16/PM8
4-Chloroaniline	<10										<10	ug/kg	TM16/PM8
4-Chlorophenylphenylether	<10										<10	ug/kg	TM16/PM8
4-Nitroaniline	<10										<10	ug/kg	TM16/PM8
Azobenzene	<10										<10	ug/kg	TM16/PM8
Bis(2-chloroethoxy)methane	<10										<10	ug/kg	TM16/PM8
Bis(2-chloroethyl)ether	<10										<10	ug/kg	TM16/PM8
Carbazole	<10										<10	ug/kg	TM16/PM8
Dibenzofuran #	<10										<10	ug/kg	TM16/PM8
Hexachlorobenzene	<10										<10	ug/kg	TM16/PM8
Hexachlorobutadiene #	<10										<10	ug/kg	TM16/PM8
Hexachlorocyclopentadiene	<10										<10	ug/kg	TM16/PM8
Hexachloroethane	<10										<10	ug/kg	TM16/PM8
Isophorone #	<10										<10	ug/kg	TM16/PM8
N-nitrosodi-n-propylamine #	<10										<10	ug/kg	TM16/PM8
Nitrobenzene #	<10										<10	ug/kg	TM16/PM8
Surrogate Recovery 2-Fluorobiphenyl	76										<0	%	TM16/PM8
Surrogate Recovery p-Terphenyl-d14	76										<0	%	TM16/PM8

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/15768

VOC Report : **Solid**

J E Sample No.	20-22												
Sample ID	TP428												
Depth	0.60-0.85												
COC No / misc													
Containers	V J												
Sample Date	20/09/2017												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	21/09/2017												

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
VOC MS													
Dichlorodifluoromethane	<2										<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2										<2	ug/kg	TM15/PM10
Chloromethane #	<3										<3	ug/kg	TM15/PM10
Vinyl Chloride	<2										<2	ug/kg	TM15_A/PM10
Bromomethane	<1										<1	ug/kg	TM15/PM10
Chloroethane #	<2										<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	5										<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6										<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<30										<30	ug/kg	TM15/PM10
trans-1-2-Dichloroethene #	<3										<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3										<3	ug/kg	TM15/PM10
cis-1-2-Dichloroethene #	<3										<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4										<4	ug/kg	TM15/PM10
Bromochloromethane #	<3										<3	ug/kg	TM15/PM10
Chloroform #	<3										<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3										<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3										<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4										<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4										<4	ug/kg	TM15/PM10
Benzene #	<3										<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	60										<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6										<6	ug/kg	TM15/PM10
Dibromomethane #	<3										<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3										<3	ug/kg	TM15/PM10
cis-1-3-Dichloropropene	<4										<4	ug/kg	TM15/PM10
Toluene #	<3										<3	ug/kg	TM15/PM10
trans-1-3-Dichloropropene	<3										<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3										<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3										<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3										<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3										<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3										<3	ug/kg	TM15/PM10
Chlorobenzene #	<3										<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane	<3										<3	ug/kg	TM15/PM10
Ethylbenzene #	<3										<3	ug/kg	TM15/PM10
p/m-Xylene #	<5										<5	ug/kg	TM15/PM10
o-Xylene #	<3										<3	ug/kg	TM15/PM10
Styrene	<3										<3	ug/kg	TM15_A/PM10
Bromoform	<3										<3	ug/kg	TM15/PM10
Isopropylbenzene #	<3										<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3										<3	ug/kg	TM15/PM10
Bromobenzene	<2										<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4										<4	ug/kg	TM15/PM10
Propylbenzene #	<4										<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3										<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3										<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3										<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5										<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<6										<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4										<4	ug/kg	TM15/PM10
4-Isopropyltoluene #	<4										<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
n-Butylbenzene #	<4										<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane #	<4										<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene #	<7										<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4										<4	ug/kg	TM15/PM10
Naphthalene	<27										<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene #	<7										<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	89										<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	84										<0	%	TM15/PM10

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
17/15768	1	TP428	0.60-0.85	22	27/09/2017	**General Description (Bulk Analysis)**	Soil/Stone
					27/09/2017	**Asbestos Fibres**	NAD
					27/09/2017	**Asbestos Fibres (2)**	NAD
					27/09/2017	**Asbestos ACM**	NAD
					27/09/2017	**Asbestos ACM (2)**	NAD
					27/09/2017	**Asbestos Type**	NAD
					27/09/2017	**Asbestos Type (2)**	NAD
					27/09/2017	**Asbestos Level Screen**	NAD
17/15768	1	TP429	0.30-0.35	29	27/09/2017	**General Description (Bulk Analysis)**	Soil/Stone
					27/09/2017	**Asbestos Fibres**	NAD
					27/09/2017	**Asbestos Fibres (2)**	NAD
					27/09/2017	**Asbestos ACM**	NAD
					27/09/2017	**Asbestos ACM (2)**	NAD
					27/09/2017	**Asbestos Type**	NAD
					27/09/2017	**Asbestos Type (2)**	NAD
					27/09/2017	**Asbestos Level Screen**	NAD
17/15768	1	TP427	0.50-0.70	38	27/09/2017	**General Description (Bulk Analysis)**	Soil/Stone
					27/09/2017	**Asbestos Fibres**	NAD
					27/09/2017	**Asbestos Fibres (2)**	NAD
					27/09/2017	**Asbestos ACM**	NAD
					27/09/2017	**Asbestos ACM (2)**	NAD
					27/09/2017	**Asbestos Type**	NAD
					27/09/2017	**Asbestos Type (2)**	NAD
					27/09/2017	**Asbestos Level Screen**	NAD
17/15768	1	TP430	0.60-0.80	44	27/09/2017	**General Description (Bulk Analysis)**	soil/stones
					27/09/2017	**Asbestos Fibres**	NAD
					27/09/2017	**Asbestos Fibres (2)**	NAD
					27/09/2017	**Asbestos ACM**	NAD
					27/09/2017	**Asbestos ACM (2)**	NAD
					27/09/2017	**Asbestos Type**	NAD
					27/09/2017	**Asbestos Type (2)**	NAD
					27/09/2017	**Asbestos Level Screen**	NAD
17/15768	1	TP426	0.10-0.20	50	27/09/2017	**General Description (Bulk Analysis)**	soil/stones
					27/09/2017	**Asbestos Fibres**	NAD
					27/09/2017	**Asbestos Fibres (2)**	NAD

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
17/15768	1	TP426	0.10-0.20	50	27/09/2017	**Asbestos ACM**	NAD
					27/09/2017	**Asbestos ACM (2)**	NAD
					27/09/2017	**Asbestos Type**	NAD
					27/09/2017	**Asbestos Type (2)**	NAD
					27/09/2017	**Asbestos Level Screen**	NAD
17/15768	1	BH233	0.60-0.80	56	27/09/2017	**General Description (Bulk Analysis)**	soil/stones
					27/09/2017	**Asbestos Fibres**	NAD
					27/09/2017	**Asbestos Fibres (2)**	NAD
					27/09/2017	**Asbestos ACM**	NAD
					27/09/2017	**Asbestos ACM (2)**	NAD
					27/09/2017	**Asbestos Type**	NAD
					27/09/2017	**Asbestos Type (2)**	NAD
					27/09/2017	**Asbestos Level Screen**	NAD

Client Name: Ramboll Environ UK Ltd

Reference: UK1522306

Location: WMI Four Ashes

Contact: Matt Royall

Matrix : Solid

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	NDP Reason
17/15768	1	TP434	0.10-0.30	13	Insufficient sample for test
17/15768	1	TP429	0.50-0.70	30	Insufficient sample for test

Client Name: Ramboll Environ UK Ltd

Reference: UK1522306

Location: WMI Four Ashes

Contact: Matt Royall

Matrix : Solid

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
17/15768	1	TP434	0.10-0.30	13	GRO	Solid Samples were received at a temperature above 9°C.
17/15768	1	TP428	0.60-0.85	20-22	GRO, VOC	Solid Samples were received at a temperature above 9°C.
17/15768	1	TP429	0.50-0.70	30	GRO	Solid Samples were received at a temperature above 9°C.
17/15768	1	TP427	0.50-0.70	37-38	GRO	Solid Samples were received at a temperature above 9°C.
17/15768	1	TP430	0.60-0.80	42-44	GRO	Solid Samples were received at a temperature above 9°C.
17/15768	1	TP426	0.10-0.20	48-50	GRO	Solid Samples were received at a temperature above 9°C.
17/15768	1	BH233	0.60-0.80	54-56	GRO	Solid Samples were received at a temperature above 9°C.

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 17/15768

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS) accredited - UK.
SA	ISO17025 (SANAS) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 17/15768

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	TM005: Modified USEPA 8015B: Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID. TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID. Including determination of BTEX and calculation of Aliphatic fractions	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5/TM36	TM005: Modified USEPA 8015B: Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID. TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID. Including determination of BTEX and calculation of Aliphatic fractions	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes

JE Job No: 17/15768

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid or water samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital shaker.			AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No

JE Job No: 17/15768

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.	Yes		AR	Yes
NONE	No Method Code	NONE	No Method Code			AR	Yes
TM15_A	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

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Ramboll Environ UK Ltd
8 The Wharf
Birmingham
B1 2JS

Attention :	Matt Royall
Date :	6th October, 2017
Your reference :	UK1522306
Our reference :	Test Report 17/15983 Batch 1
Location :	WMI Four Ashes
Date samples received :	23rd September, 2017
Status :	Final report
Issue :	1

Fourteen samples were received for analysis on 23rd September, 2017 of which eleven were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

[redacted]

Simon Gomery BSc
Project Manager

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/15983

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-6	7-9	10-12	16-18	19-21	22-24	25-27	28	29-31	LOD/LOR	Units	Method No.
Sample ID	TP425	TP425	SP9	SP9	BH232	BH232	TP433	TP433	TP431	TP431			
Depth	0.10-0.25	0.40-0.70	0.10-0.30	1.90-2.00	0.50-0.70	2.20-2.40	0.20-0.25	1.80-2.00	0.20-0.25	0.50-0.70			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V	V J			
Sample Date	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	23/09/2017	23/09/2017	23/09/2017	23/09/2017	23/09/2017	23/09/2017	23/09/2017	23/09/2017	23/09/2017	23/09/2017			
Arsenic #	-	4.4	4.6	-	8.8	8.2	9.8	6.4	-	3.7	<0.5	mg/kg	TM30/PM15
Beryllium	-	1.0	0.8	-	1.3	1.2	1.4	0.9	-	<0.5	<0.5	mg/kg	TM30/PM15
Cadmium #	-	<0.1	0.4	-	0.4	0.3	0.6	<0.1	-	<0.1	<0.1	mg/kg	TM30/PM15
Chromium #	-	45.3	38.2	-	43.2	56.1	44.6	60.0	-	64.7	<0.5	mg/kg	TM30/PM15
Copper #	-	8	11	-	67	76	47	12	-	4	<1	mg/kg	TM30/PM15
Lead #	-	<5	28	-	85	98	82	6	-	12	<5	mg/kg	TM30/PM15
Mercury #	-	<0.1	<0.1	-	<0.1	2.9	0.2	<0.1	-	<0.1	<0.1	mg/kg	TM30/PM15
Nickel #	-	17.3	12.2	-	26.0	27.4	19.9	13.0	-	12.1	<0.7	mg/kg	TM30/PM15
Selenium #	-	<1	<1	-	<1	<1	<1	<1	-	<1	<1	mg/kg	TM30/PM15
Vanadium	-	28	24	-	32	32	29	24	-	17	<1	mg/kg	TM30/PM15
Water Soluble Boron #	-	0.5	0.6	-	1.4	2.0	1.5	0.5	-	0.5	<0.1	mg/kg	TM74/PM32
Zinc #	-	16	56	-	138	141	143	28	-	30	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	-	<0.04	<0.04	-	<0.04	<0.04	<0.04	<0.04	-	<0.04	<0.04	mg/kg	TM4/PM8
Acenaphthylene	-	<0.03	<0.03	-	<0.03	<0.03	<0.03	<0.03	-	<0.03	<0.03	mg/kg	TM4/PM8
Acenaphthene #	-	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	mg/kg	TM4/PM8
Fluorene #	-	<0.04	<0.04	-	<0.04	<0.04	<0.04	<0.04	-	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene #	-	<0.03	<0.03	-	0.13	0.05	0.06	<0.03	-	<0.03	<0.03	mg/kg	TM4/PM8
Anthracene #	-	<0.04	<0.04	-	0.07	<0.04	<0.04	<0.04	-	<0.04	<0.04	mg/kg	TM4/PM8
Fluoranthene #	-	<0.03	<0.03	-	0.34	0.17	0.14	<0.03	-	<0.03	<0.03	mg/kg	TM4/PM8
Pyrene #	-	<0.03	<0.03	-	0.39	0.15	0.13	<0.03	-	<0.03	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	-	<0.06	<0.06	-	0.28	0.15	0.12	<0.06	-	<0.06	<0.06	mg/kg	TM4/PM8
Chrysene #	-	<0.02	<0.02	-	0.25	0.11	0.09	<0.02	-	<0.02	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	-	<0.07	<0.07	-	0.73	0.20	0.20	<0.07	-	<0.07	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	-	<0.04	<0.04	-	0.44	0.12	0.10	<0.04	-	<0.04	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	-	<0.04	<0.04	-	0.33	0.08	0.08	<0.04	-	<0.04	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	-	<0.04	<0.04	-	0.06	<0.04	<0.04	<0.04	-	<0.04	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	-	<0.04	<0.04	-	0.36	0.08	0.08	<0.04	-	<0.04	<0.04	mg/kg	TM4/PM8
PAH 16 Total	-	<0.6	<0.6	-	3.4	1.1	1.0	<0.6	-	<0.6	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	-	<0.05	<0.05	-	0.53	0.14	0.14	<0.05	-	<0.05	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	-	<0.02	<0.02	-	0.20	0.06	0.06	<0.02	-	<0.02	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	-	82	86	-	88	86	87	86	-	85	<0	%	TM4/PM8
Methyl Tertiary Butyl Ether #	-	-	-	-	<2	-	-	-	-	-	<2	ug/kg	TM15/PM10
Benzene #	-	-	-	-	<3	-	-	-	-	-	<3	ug/kg	TM15/PM10
Toluene #	-	-	-	-	<3	-	-	-	-	-	<3	ug/kg	TM15/PM10
Ethylbenzene #	-	-	-	-	<3	-	-	-	-	-	<3	ug/kg	TM15/PM10
p/m-Xylene #	-	-	-	-	<5	-	-	-	-	-	<5	ug/kg	TM15/PM10
o-Xylene #	-	-	-	-	<3	-	-	-	-	-	<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	-	-	-	-	105	-	-	-	-	-	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	-	-	-	-	98	-	-	-	-	-	<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/15983

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-6	7-9	10-12	16-18	19-21	22-24	25-27	28	29-31	LOD/LOR	Units	Method No.
Sample ID	TP425	TP425	SP9	SP9	BH232	BH232	TP433	TP433	TP431	TP431			
Depth	0.10-0.25	0.40-0.70	0.10-0.30	1.90-2.00	0.50-0.70	2.20-2.40	0.20-0.25	1.80-2.00	0.20-0.25	0.50-0.70			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V	V J			
Sample Date	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	23/09/2017	23/09/2017	23/09/2017	23/09/2017	23/09/2017	23/09/2017	23/09/2017	23/09/2017	23/09/2017	23/09/2017			
Pesticides													
Organochlorine Pesticides													
Aldrin	<10	-	<10	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Alpha-HCH (BHC)	<10	-	<10	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Beta-HCH (BHC)	<10	-	<10	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Delta-HCH (BHC)	<10	-	<10	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Dieldrin	40	-	29	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Endosulphan I	<10	-	<10	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Endosulphan II	<10	-	<10	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Endosulphan sulphate	<10	-	<10	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Endrin	<10	-	<10	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Gamma-HCH (BHC)	<10	-	<10	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Heptachlor	<10	-	<10	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Heptachlor Epoxide	<10	-	<10	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
p,p'-DDE	<10	-	<10	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
p,p'-DDT	<10	-	<10	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
p,p'-TDE	<10	-	<10	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Total Methoxychlor	<10	-	<10	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Organophosphorus Pesticides													
Azinphos methyl	<10	-	<10	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Diazinon	<10	-	<10	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Dichlorvos	<10	-	<10	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Disulfoton	<10	-	<10	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Ethion	<10	-	<10	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Ethyl Parathion (Parathion)	<10	-	<10	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Fenitrothion	<10	-	<10	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Malathion	<10	-	<10	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Methyl Parathion	<10	-	<10	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Mevinphos	<10	-	<10	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
2,3,6 - TBA	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
2,4 - D	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
2,4 - DB	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
2,4,5 - T	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
4 - CPA	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
Benazolin	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
Bentazone	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
Bromoxynil	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
Clopyralid	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
Dicamba	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
Dichloroprop	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
Diclofop	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
Fenoprop	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
Flamprop	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/15983

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-6	7-9	10-12	16-18	19-21	22-24	25-27	28	29-31	LOD/LOR	Units	Method No.
Sample ID	TP425	TP425	SP9	SP9	BH232	BH232	TP433	TP433	TP431	TP431			
Depth	0.10-0.25	0.40-0.70	0.10-0.30	1.90-2.00	0.50-0.70	2.20-2.40	0.20-0.25	1.80-2.00	0.20-0.25	0.50-0.70			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V	V J			
Sample Date	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	23/09/2017	23/09/2017	23/09/2017	23/09/2017	23/09/2017	23/09/2017	23/09/2017	23/09/2017	23/09/2017	23/09/2017			
Flamprop – isopropyl	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
Ioxynil	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
MCPA	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
MCPB	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
Mecoprop	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
Pentachlorophenol	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
Picloram	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
Triclopyr	<0.1	-	<0.1	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
TPH CWG													
Aliphatics													
>C5-C6 #	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	mg/kg	TM36/PM12
>C6-C8 #	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	mg/kg	TM36/PM12
>C8-C10	-	<0.1	<0.1	-	<0.1	<0.1	0.1	<0.1	-	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 #	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	mg/kg	TM5/PM16
>C12-C16 #	-	<4	<4	-	<4	<4	<4	<4	-	<4	<4	mg/kg	TM5/PM16
>C16-C21 #	-	<7	<7	-	<7	<7	<7	<7	-	<7	<7	mg/kg	TM5/PM16
>C21-C35 #	-	<7	<7	-	<7	<7	<7	<7	-	<7	<7	mg/kg	TM5/PM16
Total aliphatics C5-35	-	<19	<19	-	<19	<19	<19	<19	-	<19	<19	mg/kg	TM5/TM36/PM12/PM16
Aromatics													
>C5-EC7 #	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	mg/kg	TM5/PM16
>EC12-EC16 #	-	<4	<4	-	4	<4	<4	<4	-	<4	<4	mg/kg	TM5/PM16
>EC16-EC21 #	-	<7	<7	-	46	<7	<7	<7	-	<7	<7	mg/kg	TM5/PM16
>EC21-EC35 #	-	<7	<7	-	105	<7	<7	<7	-	<7	<7	mg/kg	TM5/PM16
Total aromatics C5-35 #	-	<19	<19	-	155	<19	<19	<19	-	<19	<19	mg/kg	TM5/TM36/PM12/PM16
Total aliphatics and aromatics(C5-35)	-	<38	<38	-	155	<38	<38	<38	-	<38	<38	mg/kg	TM5/TM36/PM12/PM16
MTBE #	-	<5	<5	-	-	<5	<5	<5	-	<5	<5	ug/kg	TM31/PM12
Benzene #	-	<5	<5	-	-	59	<5	<5	-	<5	<5	ug/kg	TM31/PM12
Toluene #	-	<5	<5	-	-	<5	<5	<5	-	<5	<5	ug/kg	TM31/PM12
Ethylbenzene #	-	<5	<5	-	-	<5	<5	<5	-	<5	<5	ug/kg	TM31/PM12
m/p-Xylene #	-	<5	<5	-	-	<5	<5	<5	-	<5	<5	ug/kg	TM31/PM12
o-Xylene #	-	<5	<5	-	-	<5	<5	<5	-	<5	<5	ug/kg	TM31/PM12
PCB 28 #	-	-	-	-	-	-	-	-	<5	-	<5	ug/kg	TM17/PM8
PCB 52 #	-	-	-	-	-	-	-	-	<5	-	<5	ug/kg	TM17/PM8
PCB 101 #	-	-	-	-	-	-	-	-	<5	-	<5	ug/kg	TM17/PM8
PCB 118 #	-	-	-	-	-	-	-	-	<5	-	<5	ug/kg	TM17/PM8
PCB 138 #	-	-	-	-	-	-	-	-	<5	-	<5	ug/kg	TM17/PM8
PCB 153 #	-	-	-	-	-	-	-	-	<5	-	<5	ug/kg	TM17/PM8
PCB 180 #	-	-	-	-	-	-	-	-	<5	-	<5	ug/kg	TM17/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/15983

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-6	7-9	10-12	16-18	19-21	22-24	25-27	28	29-31	LOD/LOR	Units	Method No.
Sample ID	TP425	TP425	SP9	SP9	BH232	BH232	TP433	TP433	TP431	TP431			
Depth	0.10-0.25	0.40-0.70	0.10-0.30	1.90-2.00	0.50-0.70	2.20-2.40	0.20-0.25	1.80-2.00	0.20-0.25	0.50-0.70			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V	V J			
Sample Date	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017	21/09/2017			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	23/09/2017	23/09/2017	23/09/2017	23/09/2017	23/09/2017	23/09/2017	23/09/2017	23/09/2017	23/09/2017	23/09/2017			
Total 7 PCBs #	-	-	-	-	-	-	-	-	<35	-	<35	ug/kg	TM17/PM8
Total Phenols HPLC	-	<0.15	<0.15	-	<0.15	<0.15	<0.15	<0.15	-	<0.15	<0.15	mg/kg	TM26/PM21
Natural Moisture Content	20.5	8.0	13.5	-	12.1	18.9	15.8	13.3	18.3	4.4	<0.1	%	PM4/PM0
Hexavalent Chromium #	-	<0.3	<0.3	-	<0.3	<0.3	<0.3	<0.3	-	<0.3	<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	-	0.0022	0.0089	-	0.0254	0.0445	0.0197	0.0075	-	<0.0015	<0.0015	g/l	TM38/PM20
Chromium III	-	45.3	38.2	-	43.2	56.1	44.6	60.0	-	64.7	<0.5	mg/kg	NONE/NONE
Total Cyanide #	-	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	mg/kg	TM89/PM45
Fraction Organic Carbon	0.028	-	-	<0.001	-	-	-	0.001	-	-	<0.001	None	TM21/PM24
pH #	-	7.51	7.10	-	8.17	10.10	7.28	7.65	-	7.37	<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/15983

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	32-34										Please see attached notes for all abbreviations and acronyms		
Sample ID	TP431												
Depth	1.20-1.50												
COC No / misc													
Containers	V J												
Sample Date	21/09/2017												
Sample Type	Soil												
Batch Number	1										LOD/LOR	Units	Method No.
Date of Receipt	23/09/2017												
Arsenic #	-										<0.5	mg/kg	TM30/PM15
Beryllium	-										<0.5	mg/kg	TM30/PM15
Cadmium #	-										<0.1	mg/kg	TM30/PM15
Chromium #	-										<0.5	mg/kg	TM30/PM15
Copper #	-										<1	mg/kg	TM30/PM15
Lead #	-										<5	mg/kg	TM30/PM15
Mercury #	-										<0.1	mg/kg	TM30/PM15
Nickel #	-										<0.7	mg/kg	TM30/PM15
Selenium #	-										<1	mg/kg	TM30/PM15
Vanadium	-										<1	mg/kg	TM30/PM15
Water Soluble Boron #	-										<0.1	mg/kg	TM74/PM32
Zinc #	-										<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	-										<0.04	mg/kg	TM4/PM8
Acenaphthylene	-										<0.03	mg/kg	TM4/PM8
Acenaphthene #	-										<0.05	mg/kg	TM4/PM8
Fluorene #	-										<0.04	mg/kg	TM4/PM8
Phenanthrene #	-										<0.03	mg/kg	TM4/PM8
Anthracene #	-										<0.04	mg/kg	TM4/PM8
Fluoranthene #	-										<0.03	mg/kg	TM4/PM8
Pyrene #	-										<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	-										<0.06	mg/kg	TM4/PM8
Chrysene #	-										<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	-										<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	-										<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	-										<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	-										<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	-										<0.04	mg/kg	TM4/PM8
PAH 16 Total	-										<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	-										<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	-										<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	-										<0	%	TM4/PM8
Methyl Tertiary Butyl Ether #	-										<2	ug/kg	TM15/PM10
Benzene #	-										<3	ug/kg	TM15/PM10
Toluene #	-										<3	ug/kg	TM15/PM10
Ethylbenzene #	-										<3	ug/kg	TM15/PM10
p/m-Xylene #	-										<5	ug/kg	TM15/PM10
o-Xylene #	-										<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	-										<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	-										<0	%	TM15/PM10

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/15983

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	32-34												
Sample ID	TP431												
Depth	1.20-1.50												
COC No / misc													
Containers	V J												
Sample Date	21/09/2017												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	23/09/2017												

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
Pesticides													
Organochlorine Pesticides													
Aldrin	-										<10	ug/kg	TM42/PM8
Alpha-HCH (BHC)	-										<10	ug/kg	TM42/PM8
Beta-HCH (BHC)	-										<10	ug/kg	TM42/PM8
Delta-HCH (BHC)	-										<10	ug/kg	TM42/PM8
Dieldrin	-										<10	ug/kg	TM42/PM8
Endosulphan I	-										<10	ug/kg	TM42/PM8
Endosulphan II	-										<10	ug/kg	TM42/PM8
Endosulphan sulphate	-										<10	ug/kg	TM42/PM8
Endrin	-										<10	ug/kg	TM42/PM8
Gamma-HCH (BHC)	-										<10	ug/kg	TM42/PM8
Heptachlor	-										<10	ug/kg	TM42/PM8
Heptachlor Epoxide	-										<10	ug/kg	TM42/PM8
p,p'-DDE	-										<10	ug/kg	TM42/PM8
p,p'-DDT	-										<10	ug/kg	TM42/PM8
p,p'-TDE	-										<10	ug/kg	TM42/PM8
Total Methoxychlor	-										<10	ug/kg	TM42/PM8
Organophosphorus Pesticides													
Azinphos methyl	-										<10	ug/kg	TM42/PM8
Diazinon	-										<10	ug/kg	TM42/PM8
Dichlorvos	-										<10	ug/kg	TM42/PM8
Disulfoton	-										<10	ug/kg	TM42/PM8
Ethion	-										<10	ug/kg	TM42/PM8
Ethyl Parathion (Parathion)	-										<10	ug/kg	TM42/PM8
Fenitrothion	-										<10	ug/kg	TM42/PM8
Malathion	-										<10	ug/kg	TM42/PM8
Methyl Parathion	-										<10	ug/kg	TM42/PM8
Mevinphos	-										<10	ug/kg	TM42/PM8
2,3,6 - TBA	-										<0.1	mg/kg	TM42/PM8
2,4 - D	-										<0.1	mg/kg	TM42/PM8
2,4 - DB	-										<0.1	mg/kg	TM42/PM8
2,4,5 - T	-										<0.1	mg/kg	TM42/PM8
4 - CPA	-										<0.1	mg/kg	TM42/PM8
Benazolin	-										<0.1	mg/kg	TM42/PM8
Bentazone	-										<0.1	mg/kg	TM42/PM8
Bromoxynil	-										<0.1	mg/kg	TM42/PM8
Clopyralid	-										<0.1	mg/kg	TM42/PM8
Dicamba	-										<0.1	mg/kg	TM42/PM8
Dichloroprop	-										<0.1	mg/kg	TM42/PM8
Diclofop	-										<0.1	mg/kg	TM42/PM8
Fenoprop	-										<0.1	mg/kg	TM42/PM8
Flamprop	-										<0.1	mg/kg	TM42/PM8

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/15983

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	32-34										Please see attached notes for all abbreviations and acronyms		
Sample ID	TP431												
Depth	1.20-1.50												
COC No / misc													
Containers	V J												
Sample Date	21/09/2017												
Sample Type	Soil												
Batch Number	1										LOD/LOR	Units	Method No.
Date of Receipt	23/09/2017												
Flamprop – isopropyl	-										<0.1	mg/kg	TM42/PM8
Ioxynil	-										<0.1	mg/kg	TM42/PM8
MCPA	-										<0.1	mg/kg	TM42/PM8
MCPB	-										<0.1	mg/kg	TM42/PM8
Mecoprop	-										<0.1	mg/kg	TM42/PM8
Pentachlorophenol	-										<0.1	mg/kg	TM42/PM8
Picloram	-										<0.1	mg/kg	TM42/PM8
Triclopyr	-										<0.1	mg/kg	TM42/PM8
TPH CWG													
Aliphatics													
>C5-C6 #	-										<0.1	mg/kg	TM36/PM12
>C6-C8 #	-										<0.1	mg/kg	TM36/PM12
>C8-C10	-										<0.1	mg/kg	TM36/PM12
>C10-C12 #	-										<0.2	mg/kg	TM5/PM16
>C12-C16 #	-										<4	mg/kg	TM5/PM16
>C16-C21 #	-										<7	mg/kg	TM5/PM16
>C21-C35 #	-										<7	mg/kg	TM5/PM16
Total aliphatics C5-35	-										<19	mg/kg	TM5/TM36/PM12/PM16
Aromatics													
>C5-EC7 #	-										<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	-										<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	-										<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	-										<0.2	mg/kg	TM5/PM16
>EC12-EC16 #	-										<4	mg/kg	TM5/PM16
>EC16-EC21 #	-										<7	mg/kg	TM5/PM16
>EC21-EC35 #	-										<7	mg/kg	TM5/PM16
Total aromatics C5-35 #	-										<19	mg/kg	TM5/TM36/PM12/PM16
Total aliphatics and aromatics(C5-35)	-										<38	mg/kg	TM5/TM36/PM12/PM16
MTBE #	-										<5	ug/kg	TM31/PM12
Benzene #	-										<5	ug/kg	TM31/PM12
Toluene #	-										<5	ug/kg	TM31/PM12
Ethylbenzene #	-										<5	ug/kg	TM31/PM12
m/p-Xylene #	-										<5	ug/kg	TM31/PM12
o-Xylene #	-										<5	ug/kg	TM31/PM12
PCB 28 #	-										<5	ug/kg	TM17/PM8
PCB 52 #	-										<5	ug/kg	TM17/PM8
PCB 101 #	-										<5	ug/kg	TM17/PM8
PCB 118 #	-										<5	ug/kg	TM17/PM8
PCB 138 #	-										<5	ug/kg	TM17/PM8
PCB 153 #	-										<5	ug/kg	TM17/PM8
PCB 180 #	-										<5	ug/kg	TM17/PM8

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/15983

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	32-34										Please see attached notes for all abbreviations and acronyms		
Sample ID	TP431												
Depth	1.20-1.50												
COC No / misc													
Containers	V J												
Sample Date	21/09/2017												
Sample Type	Soil												
Batch Number	1										LOD/LOR	Units	Method No.
Date of Receipt	23/09/2017												
Total 7 PCBs #	-										<35	ug/kg	TM17/PM8
Total Phenols HPLC	-										<0.15	mg/kg	TM26/PM21
Natural Moisture Content	-										<0.1	%	PM4/PM0
Hexavalent Chromium #	-										<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	-										<0.0015	g/l	TM38/PM20
Chromium III	-										<0.5	mg/kg	NONE/NONE
Total Cyanide #	-										<0.5	mg/kg	TM89/PM45
Fraction Organic Carbon	<0.001										<0.001	None	TM21/PM24
pH #	-										<0.01	pH units	TM73/PM11

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/15983

SVOC Report : **Solid**

J E Sample No.	16-18	LOD/LOR	Units	Method No.
Sample ID	BH232			
Depth	0.50-0.70			
COC No / misc				
Containers	V J			
Sample Date	21/09/2017			
Sample Type	Soil			
Batch Number	1			
Date of Receipt	23/09/2017			
SVOC MS				
Phenols				
2-Chlorophenol #	<10	<10	ug/kg	TM16/PM8
2-Methylphenol	<10	<10	ug/kg	TM16/PM8
2-Nitrophenol	<10	<10	ug/kg	TM16/PM8
2,4-Dichlorophenol #	<10	<10	ug/kg	TM16/PM8
2,4-Dimethylphenol	<10	<10	ug/kg	TM16/PM8
2,4,5-Trichlorophenol	<10	<10	ug/kg	TM16/PM8
2,4,6-Trichlorophenol	<10	<10	ug/kg	TM16/PM8
4-Chloro-3-methylphenol	<10	<10	ug/kg	TM16/PM8
4-Methylphenol	<10	<10	ug/kg	TM16/PM8
4-Nitrophenol	<10	<10	ug/kg	TM16/PM8
Pentachlorophenol	<10	<10	ug/kg	TM16/PM8
Phenol #	<10	<10	ug/kg	TM16/PM8
PAHs				
2-Chloronaphthalene #	<10	<10	ug/kg	TM16/PM8
2-Methylnaphthalene #	<10	<10	ug/kg	TM16/PM8
Phthalates				
Bis(2-ethylhexyl) phthalate	<100	<100	ug/kg	TM16/PM8
Butylbenzyl phthalate	<100	<100	ug/kg	TM16/PM8
Di-n-butyl phthalate	<100	<100	ug/kg	TM16/PM8
Di-n-Octyl phthalate	<100	<100	ug/kg	TM16/PM8
Diethyl phthalate	<100	<100	ug/kg	TM16/PM8
Dimethyl phthalate #	<100	<100	ug/kg	TM16/PM8
Other SVOCs				
1,2-Dichlorobenzene	<10	<10	ug/kg	TM16/PM8
1,2,4-Trichlorobenzene #	<10	<10	ug/kg	TM16/PM8
1,3-Dichlorobenzene	<10	<10	ug/kg	TM16/PM8
1,4-Dichlorobenzene	<10	<10	ug/kg	TM16/PM8
2-Nitroaniline	<10	<10	ug/kg	TM16/PM8
2,4-Dinitrotoluene	<10	<10	ug/kg	TM16/PM8
2,6-Dinitrotoluene	<10	<10	ug/kg	TM16/PM8
3-Nitroaniline	<10	<10	ug/kg	TM16/PM8
4-Bromophenylphenylether #	<10	<10	ug/kg	TM16/PM8
4-Chloroaniline	<10	<10	ug/kg	TM16/PM8
4-Chlorophenylphenylether	<10	<10	ug/kg	TM16/PM8
4-Nitroaniline	<10	<10	ug/kg	TM16/PM8
Azobenzene	<10	<10	ug/kg	TM16/PM8
Bis(2-chloroethoxy)methane	<10	<10	ug/kg	TM16/PM8
Bis(2-chloroethyl)ether	<10	<10	ug/kg	TM16/PM8
Carbazole	<10	<10	ug/kg	TM16/PM8
Dibenzofuran #	<10	<10	ug/kg	TM16/PM8
Hexachlorobenzene	<10	<10	ug/kg	TM16/PM8
Hexachlorobutadiene #	<10	<10	ug/kg	TM16/PM8
Hexachlorocyclopentadiene	<10	<10	ug/kg	TM16/PM8
Hexachloroethane	<10	<10	ug/kg	TM16/PM8
Isophorone #	<10	<10	ug/kg	TM16/PM8
N-nitrosodi-n-propylamine #	<10	<10	ug/kg	TM16/PM8
Nitrobenzene #	<10	<10	ug/kg	TM16/PM8
Surrogate Recovery 2-Fluorobiphenyl	112	<0	%	TM16/PM8
Surrogate Recovery p-Terphenyl-d14	88	<0	%	TM16/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/15983

VOC Report : **Solid**

J E Sample No.	16-18												
Sample ID	BH232												
Depth	0.50-0.70												
COC No / misc													
Containers	V J												
Sample Date	21/09/2017												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	23/09/2017												

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
VOC MS													
Dichlorodifluoromethane	<2										<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2										<2	ug/kg	TM15/PM10
Chloromethane #	<3										<3	ug/kg	TM15/PM10
Vinyl Chloride	<2										<2	ug/kg	TM15_A/PM10
Bromomethane	<1										<1	ug/kg	TM15/PM10
Chloroethane #	<2										<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	<2										<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6										<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<30										<30	ug/kg	TM15/PM10
trans-1-2-Dichloroethene #	<3										<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3										<3	ug/kg	TM15/PM10
cis-1-2-Dichloroethene #	<3										<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4										<4	ug/kg	TM15/PM10
Bromochloromethane #	<3										<3	ug/kg	TM15/PM10
Chloroform #	<3										<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3										<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3										<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4										<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4										<4	ug/kg	TM15/PM10
Benzene #	<3										<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	<3										<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6										<6	ug/kg	TM15/PM10
Dibromomethane #	<3										<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3										<3	ug/kg	TM15/PM10
cis-1-3-Dichloropropene	<4										<4	ug/kg	TM15/PM10
Toluene #	<3										<3	ug/kg	TM15/PM10
trans-1-3-Dichloropropene	<3										<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3										<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3										<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3										<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3										<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3										<3	ug/kg	TM15/PM10
Chlorobenzene #	<3										<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane	<3										<3	ug/kg	TM15/PM10
Ethylbenzene #	<3										<3	ug/kg	TM15/PM10
p/m-Xylene #	<5										<5	ug/kg	TM15/PM10
o-Xylene #	<3										<3	ug/kg	TM15/PM10
Styrene	<3										<3	ug/kg	TM15_A/PM10
Bromoform	<3										<3	ug/kg	TM15/PM10
Isopropylbenzene #	<3										<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3										<3	ug/kg	TM15/PM10
Bromobenzene	<2										<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4										<4	ug/kg	TM15/PM10
Propylbenzene #	<4										<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3										<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3										<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3										<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5										<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<6										<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4										<4	ug/kg	TM15/PM10
4-Isopropyltoluene #	<4										<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
n-Butylbenzene #	<4										<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane #	<4										<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene #	<7										<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4										<4	ug/kg	TM15/PM10
Naphthalene	<27										<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene #	<7										<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	105										<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	98										<0	%	TM15/PM10

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
17/15983	1	TP425	0.10-0.25	3	03/10/2017	**General Description (Bulk Analysis)**	soil/stones
					03/10/2017	**Asbestos Fibres**	NAD
					03/10/2017	**Asbestos Fibres (2)**	NAD
					03/10/2017	**Asbestos ACM**	NAD
					03/10/2017	**Asbestos ACM (2)**	NAD
					03/10/2017	**Asbestos Type**	NAD
					03/10/2017	**Asbestos Type (2)**	NAD
					03/10/2017	**Asbestos Level Screen**	NAD
17/15983	1	SP9	0.10-0.30	9	03/10/2017	**General Description (Bulk Analysis)**	soil/stones
					03/10/2017	**Asbestos Fibres**	NAD
					03/10/2017	**Asbestos Fibres (2)**	NAD
					03/10/2017	**Asbestos ACM**	NAD
					03/10/2017	**Asbestos ACM (2)**	NAD
					03/10/2017	**Asbestos Type**	NAD
					03/10/2017	**Asbestos Type (2)**	NAD
					03/10/2017	**Asbestos Level Screen**	NAD
17/15983	1	BH232	0.50-0.70	18	03/10/2017	**General Description (Bulk Analysis)**	soil/stones
					03/10/2017	**Asbestos Fibres**	NAD
					03/10/2017	**Asbestos Fibres (2)**	NAD
					03/10/2017	**Asbestos ACM**	NAD
					03/10/2017	**Asbestos ACM (2)**	NAD
					03/10/2017	**Asbestos Type**	NAD
					03/10/2017	**Asbestos Type (2)**	NAD
					03/10/2017	**Asbestos Level Screen**	NAD
17/15983	1	TP433	0.20-0.25	24	03/10/2017	**General Description (Bulk Analysis)**	soil/stones
					03/10/2017	**Asbestos Fibres**	NAD
					03/10/2017	**Asbestos Fibres (2)**	NAD
					03/10/2017	**Asbestos ACM**	NAD
					03/10/2017	**Asbestos ACM (2)**	NAD
					03/10/2017	**Asbestos Type**	NAD
					03/10/2017	**Asbestos Type (2)**	NAD
					03/10/2017	**Asbestos Level Screen**	NAD
17/15983	1	TP431	0.20-0.25	28	03/10/2017	**General Description (Bulk Analysis)**	soil/stones
					03/10/2017	**Asbestos Fibres**	NAD
					03/10/2017	**Asbestos Fibres (2)**	NAD

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
17/15983	1	TP431	0.20-0.25	28	03/10/2017	**Asbestos ACM**	NAD
					03/10/2017	**Asbestos ACM (2)**	NAD
					03/10/2017	**Asbestos Type**	NAD
					03/10/2017	**Asbestos Type (2)**	NAD
					03/10/2017	**Asbestos Level Screen**	NAD

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 17/15983						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 17/15983

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS) accredited - UK.
SA	ISO17025 (SANAS) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 17/15983

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	TM005: Modified USEPA 8015B: Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID. TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID. Including determination of BTEX and calculation of Aliphatic fractions	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5/TM36	TM005: Modified USEPA 8015B: Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID. TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID. Including determination of BTEX and calculation of Aliphatic fractions	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes

JE Job No: 17/15983

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM17	Modified US EPA method 8270. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM21	Modified USEPA 415.1. Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid or water samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital shaker.			AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes

JE Job No: 17/15983

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM42	Modified US EPA method 8270. Pesticides and herbicdes by GC-MS	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.	Yes		AR	Yes
NONE	No Method Code	NONE	No Method Code			AR	Yes
TM15_A	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

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Ramboll Environ UK Ltd
8 The Wharf
Birmingham
B1 2JS

Attention :	Matt Royall
Date :	11th October, 2017
Your reference :	UK1522306
Our reference :	Test Report 17/16146 Batch 1
Location :	WMI Four Ashes
Date samples received :	28th September, 2017
Status :	Final report
Issue :	1

Fifteen samples were received for analysis on 28th September, 2017 of which twelve were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

[redacted]

Simon Gomery BSc
Project Manager

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/16146

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-6	7-9	10-12	13-15	19-21	22-24	28-30	34-35	36	LOD/LOR	Units	Method No.
Sample ID	WS325	WS325	WS326	WS326	WS332	WS332	WS331	WS330	WS330	WS327			
Depth	0.30-0.40	0.80-1.00	0.70-0.80	1.90-2.00	0.70-0.80	2.80-3.00	0.65-0.80	0.50-0.60	3.50-4.00	0.20-0.30			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V			
Sample Date	26/09/2017	26/09/2017	26/09/2017	26/09/2017	26/09/2017	26/09/2017	26/09/2017	27/09/2017	27/09/2017	27/09/2017			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	28/09/2017	28/09/2017	28/09/2017	28/09/2017	28/09/2017	28/09/2017	28/09/2017	28/09/2017	28/09/2017	28/09/2017			
Arsenic #	9.4	2.5	4.5	-	7.7	NDP	NDP	7.4	-	-	<0.5	mg/kg	TM30/PM15
Beryllium	1.0	0.7	<0.5	-	1.2	NDP	NDP	1.3	-	-	<0.5	mg/kg	TM30/PM15
Cadmium #	0.5	<0.1	<0.1	-	0.4	NDP	NDP	<0.1	-	-	<0.1	mg/kg	TM30/PM15
Chromium #	52.7	38.9	69.8	-	60.2	NDP	NDP	39.3	-	-	<0.5	mg/kg	TM30/PM15
Copper #	26	11	5	-	34	NDP	NDP	29	-	-	<1	mg/kg	TM30/PM15
Lead #	60	6	44	-	41	NDP	NDP	19	-	-	<5	mg/kg	TM30/PM15
Mercury #	0.2	<0.1	<0.1	-	<0.1	NDP	NDP	<0.1	-	-	<0.1	mg/kg	TM30/PM15
Nickel #	13.0	15.0	9.5	-	22.2	NDP	NDP	41.3	-	-	<0.7	mg/kg	TM30/PM15
Selenium #	<1	<1	<1	-	1	NDP	NDP	1	-	-	<1	mg/kg	TM30/PM15
Vanadium	20	20	22	-	31	NDP	NDP	26	-	-	<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.8	0.6	0.3	-	1.3	NDP	NDP	2.4	-	-	<0.1	mg/kg	TM74/PM32
Zinc #	92	20	23	-	138	NDP	NDP	79	-	-	<5	mg/kg	TM30/PM15
Arsenic	-	-	-	-	-	7.6	7.4	-	-	-	<0.5	mg/kg	TM30/PM62
Beryllium	-	-	-	-	-	1.2	1.1	-	-	-	<0.5	mg/kg	TM30/PM62
Cadmium	-	-	-	-	-	0.4	0.3	-	-	-	<0.1	mg/kg	TM30/PM62
Chromium	-	-	-	-	-	19.1	17.9	-	-	-	<0.5	mg/kg	TM30/PM62
Copper	-	-	-	-	-	44	83	-	-	-	<1	mg/kg	TM30/PM62
Lead	-	-	-	-	-	66	59	-	-	-	<5	mg/kg	TM30/PM62
Mercury	-	-	-	-	-	<0.1	<0.1	-	-	-	<0.1	mg/kg	TM30/PM62
Nickel	-	-	-	-	-	23.1	21.5	-	-	-	<0.7	mg/kg	TM30/PM62
Selenium	-	-	-	-	-	<1	<1	-	-	-	<1	mg/kg	TM30/PM62
Vanadium	-	-	-	-	-	24	26	-	-	-	<1	mg/kg	TM30/PM62
Water Soluble Boron	-	-	-	-	-	3.0	0.7	-	-	-	<0.1	mg/kg	TM74/PM61
Zinc	-	-	-	-	-	147	156	-	-	-	<5	mg/kg	TM30/PM62

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/16146

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-6	7-9	10-12	13-15	19-21	22-24	28-30	34-35	36	LOD/LOR	Units	Method No.
Sample ID	WS325	WS325	WS326	WS326	WS332	WS332	WS331	WS330	WS330	WS327			
Depth	0.30-0.40	0.80-1.00	0.70-0.80	1.90-2.00	0.70-0.80	2.80-3.00	0.65-0.80	0.50-0.60	3.50-4.00	0.20-0.30			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V			
Sample Date	26/09/2017	26/09/2017	26/09/2017	26/09/2017	26/09/2017	26/09/2017	26/09/2017	27/09/2017	27/09/2017	27/09/2017			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	28/09/2017	28/09/2017	28/09/2017	28/09/2017	28/09/2017	28/09/2017	28/09/2017	28/09/2017	28/09/2017	28/09/2017			
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	-	<0.04	<0.04	3.06	<0.04	-	-	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	-	<0.03	<0.03	0.07	<0.03	-	-	<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	-	0.24	<0.05	3.48	<0.05	-	-	<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	-	0.24	<0.04	2.94	<0.04	-	-	<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.05	<0.03	<0.03	-	2.54	0.07	19.50	<0.03	-	-	<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	-	0.54	<0.04	6.57	<0.04	-	-	<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.12	<0.03	<0.03	-	3.20	0.19	23.79++	<0.03	-	-	<0.03	mg/kg	TM4/PM8
Pyrene #	0.12	<0.03	<0.03	-	2.57	0.17	18.99	<0.03	-	-	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.09	<0.06	<0.06	-	1.09	0.12	12.17	<0.06	-	-	<0.06	mg/kg	TM4/PM8
Chrysene #	0.09	<0.02	<0.02	-	1.09	0.11	11.59	0.02	-	-	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	0.18	<0.07	<0.07	-	1.68	0.18	20.91	<0.07	-	-	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.12	<0.04	<0.04	-	1.03	0.11	12.25	<0.04	-	-	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.07	<0.04	<0.04	-	0.61	0.07	8.19	<0.04	-	-	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	-	0.09	<0.04	2.09	<0.04	-	-	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.08	<0.04	<0.04	-	0.60	0.08	7.79	<0.04	-	-	<0.04	mg/kg	TM4/PM8
PAH 16 Total	0.9	<0.6	<0.6	-	15.5	1.1	153.4	<0.6	-	-	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.13	<0.05	<0.05	-	1.21	0.13	15.06	<0.05	-	-	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.05	<0.02	<0.02	-	0.47	0.05	5.85	<0.02	-	-	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	87	90	88	-	94	90	92	94	-	-	<0	%	TM4/PM8
Methyl Tertiary Butyl Ether #	-	-	-	-	-	<2	-	<2	-	-	<2	ug/kg	TM15/PM10
Benzene #	-	-	-	-	-	<3	-	<3	-	-	<3	ug/kg	TM15/PM10
Toluene #	-	-	-	-	-	4	-	6	-	-	<3	ug/kg	TM15/PM10
Ethylbenzene #	-	-	-	-	-	<3	-	<3	-	-	<3	ug/kg	TM15/PM10
p/m-Xylene #	-	-	-	-	-	8	-	<5	-	-	<5	ug/kg	TM15/PM10
o-Xylene #	-	-	-	-	-	5	-	<3	-	-	<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	-	-	-	-	-	91	-	80	-	-	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	-	-	-	-	-	82	-	73	-	-	<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/16146

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-6	7-9	10-12	13-15	19-21	22-24	28-30	34-35	36	LOD/LOR	Units	Method No.
Sample ID	WS325	WS325	WS326	WS326	WS332	WS332	WS331	WS330	WS330	WS327			
Depth	0.30-0.40	0.80-1.00	0.70-0.80	1.90-2.00	0.70-0.80	2.80-3.00	0.65-0.80	0.50-0.60	3.50-4.00	0.20-0.30			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V			
Sample Date	26/09/2017	26/09/2017	26/09/2017	26/09/2017	26/09/2017	26/09/2017	26/09/2017	27/09/2017	27/09/2017	27/09/2017			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	28/09/2017	28/09/2017	28/09/2017	28/09/2017	28/09/2017	28/09/2017	28/09/2017	28/09/2017	28/09/2017	28/09/2017			
Pesticides													
Organochlorine Pesticides													
Aldrin	<10	-	-	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Alpha-HCH (BHC)	<10	-	-	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Beta-HCH (BHC)	<10	-	-	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Delta-HCH (BHC)	<10	-	-	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Dieldrin	<10	-	-	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Endosulphan I	<10	-	-	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Endosulphan II	<10	-	-	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Endosulphan sulphate	<10	-	-	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Endrin	<10	-	-	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Gamma-HCH (BHC)	<10	-	-	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Heptachlor	<10	-	-	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Heptachlor Epoxide	<10	-	-	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
p,p'-DDE	<10	-	-	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
p,p'-DDT	14	-	-	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
p,p'-TDE	<10	-	-	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Total Methoxychlor	<10	-	-	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Organophosphorus Pesticides													
Azinphos methyl	<10	-	-	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Diazinon	<10	-	-	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Dichlorvos	<10	-	-	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Disulfoton	<10	-	-	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Ethion	<10	-	-	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Ethyl Parathion (Parathion)	<10	-	-	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Fenitrothion	<10	-	-	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Malathion	<10	-	-	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Methyl Parathion	<10	-	-	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
Mevinphos	<10	-	-	-	-	-	-	-	-	-	<10	ug/kg	TM42/PM8
2,3,6 - TBA	<0.1	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
2,4 - D	<0.1	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
2,4 - DB	<0.1	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
2,4,5 - T	<0.1	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
4 - CPA	<0.1	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
Benazolin	<0.1	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
Bentazone	<0.1	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
Bromoxynil	<0.1	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
Clopyralid	<0.1	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
Dicamba	<0.1	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
Dichloroprop	<0.1	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
Diclofop	<0.1	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
Fenoprop	<0.1	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
Flamprop	<0.1	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/16146

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-6	7-9	10-12	13-15	19-21	22-24	28-30	34-35	36	LOD/LOR	Units	Method No.
Sample ID	WS325	WS325	WS326	WS326	WS332	WS332	WS331	WS330	WS330	WS327			
Depth	0.30-0.40	0.80-1.00	0.70-0.80	1.90-2.00	0.70-0.80	2.80-3.00	0.65-0.80	0.50-0.60	3.50-4.00	0.20-0.30			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V			
Sample Date	26/09/2017	26/09/2017	26/09/2017	26/09/2017	26/09/2017	26/09/2017	26/09/2017	27/09/2017	27/09/2017	27/09/2017			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	28/09/2017	28/09/2017	28/09/2017	28/09/2017	28/09/2017	28/09/2017	28/09/2017	28/09/2017	28/09/2017	28/09/2017			
Flamprop – isopropyl	<0.1	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
Ioxynil	<0.1	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
MCPA	<0.1	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
MCPB	<0.1	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
Mecoprop	<0.1	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
Pentachlorophenol	<0.1	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
Picloram	<0.1	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
Triclopyr	<0.1	-	-	-	-	-	-	-	-	-	<0.1	mg/kg	TM42/PM8
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	-	-	<0.2	mg/kg	TM5/PM16
>C12-C16 #	<4	<4	<4	-	<4	<4	<4	<4	-	-	<4	mg/kg	TM5/PM16
>C16-C21 #	<7	<7	<7	-	<7	<7	14	13	-	-	<7	mg/kg	TM5/PM16
>C21-C35 #	<7	<7	<7	-	10	17	57	116	-	-	<7	mg/kg	TM5/PM16
Total aliphatics C5-35	<19	<19	<19	-	<19	<19	71	129	-	-	<19	mg/kg	TM5/TM36/PM12/PM16
Aromatics													
>C5-EC7 #	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	-	-	<0.2	mg/kg	TM5/PM16
>EC12-EC16 #	<4	<4	<4	-	<4	6	<4	<4	-	-	<4	mg/kg	TM5/PM16
>EC16-EC21 #	<7	<7	<7	-	14	37	41	<7	-	-	<7	mg/kg	TM5/PM16
>EC21-EC35 #	<7	<7	<7	-	71	135	156	63	-	-	<7	mg/kg	TM5/PM16
Total aromatics C5-35 #	<19	<19	<19	-	85	178	197	63	-	-	<19	mg/kg	TM5/TM36/PM12/PM16
Total aliphatics and aromatics(C5-35)	<38	<38	<38	-	85	178	268	192	-	-	<38	mg/kg	TM5/TM36/PM12/PM16
MTBE #	<5	<5	<5	-	<5	-	<5	-	-	-	<5	ug/kg	TM31/PM12
Benzene #	<5	<5	<5	-	<5	-	<5	-	-	-	<5	ug/kg	TM31/PM12
Toluene #	<5	<5	<5	-	<5	-	<5	-	-	-	<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	<5	<5	-	<5	-	<5	-	-	-	<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	<5	<5	-	<5	-	<5	-	-	-	<5	ug/kg	TM31/PM12
o-Xylene #	<5	<5	<5	-	<5	-	<5	-	-	-	<5	ug/kg	TM31/PM12
PCB 28 #	-	-	<5	-	-	-	-	-	-	-	<5	ug/kg	TM17/PM8
PCB 52 #	-	-	<5	-	-	-	-	-	-	-	<5	ug/kg	TM17/PM8
PCB 101 #	-	-	<5	-	-	-	-	-	-	-	<5	ug/kg	TM17/PM8
PCB 118 #	-	-	<5	-	-	-	-	-	-	-	<5	ug/kg	TM17/PM8
PCB 138 #	-	-	<5	-	-	-	-	-	-	-	<5	ug/kg	TM17/PM8
PCB 153 #	-	-	<5	-	-	-	-	-	-	-	<5	ug/kg	TM17/PM8
PCB 180 #	-	-	<5	-	-	-	-	-	-	-	<5	ug/kg	TM17/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/16146

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-6	7-9	10-12	13-15	19-21	22-24	28-30	34-35	36	LOD/LOR	Units	Method No.
Sample ID	WS325	WS325	WS326	WS326	WS332	WS332	WS331	WS330	WS330	WS327			
Depth	0.30-0.40	0.80-1.00	0.70-0.80	1.90-2.00	0.70-0.80	2.80-3.00	0.65-0.80	0.50-0.60	3.50-4.00	0.20-0.30			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V			
Sample Date	26/09/2017	26/09/2017	26/09/2017	26/09/2017	26/09/2017	26/09/2017	26/09/2017	27/09/2017	27/09/2017	27/09/2017			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	28/09/2017	28/09/2017	28/09/2017	28/09/2017	28/09/2017	28/09/2017	28/09/2017	28/09/2017	28/09/2017	28/09/2017			
Total 7 PCBs #	-	-	<35	-	-	-	-	-	-	-	<35	ug/kg	TM17/PM8
Total Phenols HPLC	<0.15	<0.15	<0.15	-	<0.15	<0.15	<0.15	<0.15	-	-	<0.15	mg/kg	TM26/PM21
Natural Moisture Content	16.3	7.1	8.3	-	11.3	NDP	NDP	15.9	-	-	<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	-	<0.3	<0.3	<0.3	<0.3	-	-	<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.0027	0.0185	<0.0015	-	0.0287	NDP	NDP	0.0683	-	-	<0.0015	g/l	TM38/PM20
Sulphate as SO4 (2:1 Ext)	-	-	-	-	-	0.0763	0.0124	-	-	-	<0.0015	g/l	TM38/PM60
Chromium III	52.7	38.9	69.8	-	60.2	NDP	NDP	39.3	-	-	<0.5	mg/kg	NONE/NONE
Chromium III	-	-	-	-	-	19.1	17.9	-	-	-	<0.5	mg/kg	NONE/NONE
Total Cyanide #	0.7	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	mg/kg	TM89/PM45
Fraction Organic Carbon	-	0.005	-	0.007	-	NDP	-	-	0.007	0.040	<0.001	None	TM21/PM24
pH #	6.92	7.31	7.25	-	8.19	7.94	7.87	8.31	-	-	<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/16146

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	37-39	40-42									LOD/LOR	Units	Method No.
Sample ID	WS327	WS327											
Depth	0.60-0.75	2.00-2.50											
COC No / misc													
Containers	V J	V J											
Sample Date	27/09/2017	27/09/2017											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	28/09/2017	28/09/2017											
Arsenic #	NDP	8.3									<0.5	mg/kg	TM30/PM15
Beryllium	NDP	1.6									<0.5	mg/kg	TM30/PM15
Cadmium #	NDP	0.4									<0.1	mg/kg	TM30/PM15
Chromium #	NDP	53.4									<0.5	mg/kg	TM30/PM15
Copper #	NDP	50									<1	mg/kg	TM30/PM15
Lead #	NDP	67									<5	mg/kg	TM30/PM15
Mercury #	NDP	<0.1									<0.1	mg/kg	TM30/PM15
Nickel #	NDP	24.0									<0.7	mg/kg	TM30/PM15
Selenium #	NDP	<1									<1	mg/kg	TM30/PM15
Vanadium	NDP	35									<1	mg/kg	TM30/PM15
Water Soluble Boron #	NDP	3.5									<0.1	mg/kg	TM74/PM32
Zinc #	NDP	208									<5	mg/kg	TM30/PM15
Arsenic	13.9	-									<0.5	mg/kg	TM30/PM62
Beryllium	2.4	-									<0.5	mg/kg	TM30/PM62
Cadmium	1.0	-									<0.1	mg/kg	TM30/PM62
Chromium	28.9	-									<0.5	mg/kg	TM30/PM62
Copper	327_{AA}	-									<1	mg/kg	TM30/PM62
Lead	287	-									<5	mg/kg	TM30/PM62
Mercury	0.1	-									<0.1	mg/kg	TM30/PM62
Nickel	28.8	-									<0.7	mg/kg	TM30/PM62
Selenium	<1	-									<1	mg/kg	TM30/PM62
Vanadium	38	-									<1	mg/kg	TM30/PM62
Water Soluble Boron	1.6	-									<0.1	mg/kg	TM74/PM61
Zinc	649	-									<5	mg/kg	TM30/PM62

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/16146

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	37-39	40-42											
Sample ID	WS327	WS327											
Depth	0.60-0.75	2.00-2.50											
COC No / misc													
Containers	V J	V J											
Sample Date	27/09/2017	27/09/2017											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	28/09/2017	28/09/2017											

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
PAH MS													
Naphthalene #	<0.04	0.08									<0.04	mg/kg	TM4/PM8
Acenaphthylene	0.06	<0.03									<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05									<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.34	0.26									<0.03	mg/kg	TM4/PM8
Anthracene #	0.11	0.07									<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.90	0.48									<0.03	mg/kg	TM4/PM8
Pyrene #	0.80	0.44									<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.46	0.24									<0.06	mg/kg	TM4/PM8
Chrysene #	0.49	0.25									<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	0.92	0.45									<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.55	0.27									<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.40	0.18									<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.09	<0.04									<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.39	0.18									<0.04	mg/kg	TM4/PM8
PAH 16 Total	5.5	2.9									<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.66	0.32									<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.26	0.13									<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	89	92									<0	%	TM4/PM8
Methyl Tertiary Butyl Ether #	-	<2									<2	ug/kg	TM15/PM10
Benzene #	-	7									<3	ug/kg	TM15/PM10
Toluene #	-	6									<3	ug/kg	TM15/PM10
Ethylbenzene #	-	5									<3	ug/kg	TM15/PM10
p/m-Xylene #	-	9									<5	ug/kg	TM15/PM10
o-Xylene #	-	5									<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	-	98									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	-	80									<0	%	TM15/PM10

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/16146

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	37-39	40-42											
Sample ID	WS327	WS327											
Depth	0.60-0.75	2.00-2.50									Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V J	V J											
Sample Date	27/09/2017	27/09/2017											
Sample Type	Soil	Soil											
Batch Number	1	1									LOD/LOR	Units	Method No.
Date of Receipt	28/09/2017	28/09/2017											
Pesticides													
Organochlorine Pesticides													
Aldrin	-	-									<10	ug/kg	TM42/PM8
Alpha-HCH (BHC)	-	-									<10	ug/kg	TM42/PM8
Beta-HCH (BHC)	-	-									<10	ug/kg	TM42/PM8
Delta-HCH (BHC)	-	-									<10	ug/kg	TM42/PM8
Dieldrin	-	-									<10	ug/kg	TM42/PM8
Endosulphan I	-	-									<10	ug/kg	TM42/PM8
Endosulphan II	-	-									<10	ug/kg	TM42/PM8
Endosulphan sulphate	-	-									<10	ug/kg	TM42/PM8
Endrin	-	-									<10	ug/kg	TM42/PM8
Gamma-HCH (BHC)	-	-									<10	ug/kg	TM42/PM8
Heptachlor	-	-									<10	ug/kg	TM42/PM8
Heptachlor Epoxide	-	-									<10	ug/kg	TM42/PM8
p,p'-DDE	-	-									<10	ug/kg	TM42/PM8
p,p'-DDT	-	-									<10	ug/kg	TM42/PM8
p,p'-TDE	-	-									<10	ug/kg	TM42/PM8
Total Methoxychlor	-	-									<10	ug/kg	TM42/PM8
Organophosphorus Pesticides													
Azinphos methyl	-	-									<10	ug/kg	TM42/PM8
Diazinon	-	-									<10	ug/kg	TM42/PM8
Dichlorvos	-	-									<10	ug/kg	TM42/PM8
Disulfoton	-	-									<10	ug/kg	TM42/PM8
Ethion	-	-									<10	ug/kg	TM42/PM8
Ethyl Parathion (Parathion)	-	-									<10	ug/kg	TM42/PM8
Fenitrothion	-	-									<10	ug/kg	TM42/PM8
Malathion	-	-									<10	ug/kg	TM42/PM8
Methyl Parathion	-	-									<10	ug/kg	TM42/PM8
Mevinphos	-	-									<10	ug/kg	TM42/PM8
2,3,6 - TBA	-	-									<0.1	mg/kg	TM42/PM8
2,4 - D	-	-									<0.1	mg/kg	TM42/PM8
2,4 - DB	-	-									<0.1	mg/kg	TM42/PM8
2,4,5 - T	-	-									<0.1	mg/kg	TM42/PM8
4 - CPA	-	-									<0.1	mg/kg	TM42/PM8
Benazolin	-	-									<0.1	mg/kg	TM42/PM8
Bentazone	-	-									<0.1	mg/kg	TM42/PM8
Bromoxynil	-	-									<0.1	mg/kg	TM42/PM8
Clopyralid	-	-									<0.1	mg/kg	TM42/PM8
Dicamba	-	-									<0.1	mg/kg	TM42/PM8
Dichloroprop	-	-									<0.1	mg/kg	TM42/PM8
Diclofop	-	-									<0.1	mg/kg	TM42/PM8
Fenoprop	-	-									<0.1	mg/kg	TM42/PM8
Flamprop	-	-									<0.1	mg/kg	TM42/PM8

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/16146

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	37-39	40-42									LOD/LOR	Units	Method No.
Sample ID	WS327	WS327											
Depth	0.60-0.75	2.00-2.50											
COC No / misc													
Containers	V J	V J											
Sample Date	27/09/2017	27/09/2017											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	28/09/2017	28/09/2017											
Flamprop – isopropyl	-	-									<0.1	mg/kg	TM42/PM8
Ioxynil	-	-									<0.1	mg/kg	TM42/PM8
MCPA	-	-									<0.1	mg/kg	TM42/PM8
MCPB	-	-									<0.1	mg/kg	TM42/PM8
Mecoprop	-	-									<0.1	mg/kg	TM42/PM8
Pentachlorophenol	-	-									<0.1	mg/kg	TM42/PM8
Picloram	-	-									<0.1	mg/kg	TM42/PM8
Triclopyr	-	-									<0.1	mg/kg	TM42/PM8
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1 SV	<0.1 SV									<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1 SV	<0.1 SV									<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1 SV	<0.1 SV									<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2									<0.2	mg/kg	TM5/PM16
>C12-C16 #	<4	7									<4	mg/kg	TM5/PM16
>C16-C21 #	<7	35									<7	mg/kg	TM5/PM16
>C21-C35 #	31	94									<7	mg/kg	TM5/PM16
Total aliphatics C5-35	31	136									<19	mg/kg	TM5/TM36/PM12/PM16
Aromatics													
>C5-EC7 #	<0.1 SV	<0.1 SV									<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1 SV	<0.1 SV									<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1 SV	<0.1 SV									<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2									<0.2	mg/kg	TM5/PM16
>EC12-EC16 #	<4	<4									<4	mg/kg	TM5/PM16
>EC16-EC21 #	25	24									<7	mg/kg	TM5/PM16
>EC21-EC35 #	111	101									<7	mg/kg	TM5/PM16
Total aromatics C5-35 #	136	125									<19	mg/kg	TM5/TM36/PM12/PM16
Total aliphatics and aromatics(C5-35)	167	261									<38	mg/kg	TM5/TM36/PM12/PM16
MTBE #	<5 SV	-									<5	ug/kg	TM31/PM12
Benzene #	<5 SV	-									<5	ug/kg	TM31/PM12
Toluene #	<5 SV	-									<5	ug/kg	TM31/PM12
Ethylbenzene #	<5 SV	-									<5	ug/kg	TM31/PM12
m/p-Xylene #	<5 SV	-									<5	ug/kg	TM31/PM12
o-Xylene #	<5 SV	-									<5	ug/kg	TM31/PM12
PCB 28 #	-	-									<5	ug/kg	TM17/PM8
PCB 52 #	-	-									<5	ug/kg	TM17/PM8
PCB 101 #	-	-									<5	ug/kg	TM17/PM8
PCB 118 #	-	-									<5	ug/kg	TM17/PM8
PCB 138 #	-	-									<5	ug/kg	TM17/PM8
PCB 153 #	-	-									<5	ug/kg	TM17/PM8
PCB 180 #	-	-									<5	ug/kg	TM17/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/16146

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	37-39	40-42											
Sample ID	WS327	WS327											
Depth	0.60-0.75	2.00-2.50											
COC No / misc													
Containers	V J	V J											
Sample Date	27/09/2017	27/09/2017											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	28/09/2017	28/09/2017											
Total 7 PCBs #	-	-										<35	ug/kg	TM17/PM8
Total Phenols HPLC	<0.15	<0.15										<0.15	mg/kg	TM26/PM21
Natural Moisture Content	NDP	18.0										<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3										<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	NDP	0.1217										<0.0015	g/l	TM38/PM20
Sulphate as SO4 (2:1 Ext)	0.0325	-										<0.0015	g/l	TM38/PM60
Chromium III	NDP	53.4										<0.5	mg/kg	NONE/NONE
Chromium III	28.9	-										<0.5	mg/kg	NONE/NONE
Total Cyanide #	<0.5	<0.5										<0.5	mg/kg	TM89/PM45
Fraction Organic Carbon	-	-										<0.001	None	TM21/PM24
pH #	8.17	7.83										<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/16146

SVOC Report : **Solid**

J E Sample No.	19-21												
Sample ID	WS332												
Depth	2.80-3.00										Please see attached notes for all abbreviations and acronyms		
COC No / misc													
Containers	V J												
Sample Date	26/09/2017												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	28/09/2017										LOD/LOR	Units	Method No.
SVOC MS													
Phenols													
2-Chlorophenol #	<10										<10	ug/kg	TM16/PM8
2-Methylphenol	<10										<10	ug/kg	TM16/PM8
2-Nitrophenol	<10										<10	ug/kg	TM16/PM8
2,4-Dichlorophenol #	<10										<10	ug/kg	TM16/PM8
2,4-Dimethylphenol	<10										<10	ug/kg	TM16/PM8
2,4,5-Trichlorophenol	<10										<10	ug/kg	TM16/PM8
2,4,6-Trichlorophenol	<10										<10	ug/kg	TM16/PM8
4-Chloro-3-methylphenol	<10										<10	ug/kg	TM16/PM8
4-Methylphenol	<10										<10	ug/kg	TM16/PM8
4-Nitrophenol	<10										<10	ug/kg	TM16/PM8
Pentachlorophenol	<10										<10	ug/kg	TM16/PM8
Phenol #	<10										<10	ug/kg	TM16/PM8
PAHs													
2-Chloronaphthalene #	<10										<10	ug/kg	TM16/PM8
2-Methylnaphthalene #	<10										<10	ug/kg	TM16/PM8
Phthalates													
Bis(2-ethylhexyl) phthalate	<100										<100	ug/kg	TM16/PM8
Butylbenzyl phthalate	<100										<100	ug/kg	TM16/PM8
Di-n-butyl phthalate	<100										<100	ug/kg	TM16/PM8
Di-n-Octyl phthalate	<100										<100	ug/kg	TM16/PM8
Diethyl phthalate	<100										<100	ug/kg	TM16/PM8
Dimethyl phthalate #	<100										<100	ug/kg	TM16/PM8
Other SVOCs													
1,2-Dichlorobenzene	<10										<10	ug/kg	TM16/PM8
1,2,4-Trichlorobenzene #	<10										<10	ug/kg	TM16/PM8
1,3-Dichlorobenzene	<10										<10	ug/kg	TM16/PM8
1,4-Dichlorobenzene	<10										<10	ug/kg	TM16/PM8
2-Nitroaniline	<10										<10	ug/kg	TM16/PM8
2,4-Dinitrotoluene	<10										<10	ug/kg	TM16/PM8
2,6-Dinitrotoluene	<10										<10	ug/kg	TM16/PM8
3-Nitroaniline	<10										<10	ug/kg	TM16/PM8
4-Bromophenylphenylether #	<10										<10	ug/kg	TM16/PM8
4-Chloroaniline	<10										<10	ug/kg	TM16/PM8
4-Chlorophenylphenylether	<10										<10	ug/kg	TM16/PM8
4-Nitroaniline	<10										<10	ug/kg	TM16/PM8
Azobenzene	<10										<10	ug/kg	TM16/PM8
Bis(2-chloroethoxy)methane	<10										<10	ug/kg	TM16/PM8
Bis(2-chloroethyl)ether	<10										<10	ug/kg	TM16/PM8
Carbazole	<10										<10	ug/kg	TM16/PM8
Dibenzofuran #	<10										<10	ug/kg	TM16/PM8
Hexachlorobenzene	<10										<10	ug/kg	TM16/PM8
Hexachlorobutadiene #	<10										<10	ug/kg	TM16/PM8
Hexachlorocyclopentadiene	<10										<10	ug/kg	TM16/PM8
Hexachloroethane	<10										<10	ug/kg	TM16/PM8
Isophorone #	<10										<10	ug/kg	TM16/PM8
N-nitrosodi-n-propylamine #	<10										<10	ug/kg	TM16/PM8
Nitrobenzene #	<10										<10	ug/kg	TM16/PM8
Surrogate Recovery 2-Fluorobiphenyl	92										<0	%	TM16/PM8
Surrogate Recovery p-Terphenyl-d14	84										<0	%	TM16/PM8

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/16146

VOC Report : **Solid**

J E Sample No.	19-21	28-30	40-42									
Sample ID	WS332	WS330	WS327									
Depth	2.80-3.00	0.50-0.60	2.00-2.50							Please see attached notes for all abbreviations and acronyms		
COC No / misc												
Containers	V J	V J	V J									
Sample Date	26/09/2017	27/09/2017	27/09/2017									
Sample Type	Soil	Soil	Soil									
Batch Number	1	1	1									
Date of Receipt	28/09/2017	28/09/2017	28/09/2017							LOD/LOR	Units	Method No.
VOC MS												
Dichlorodifluoromethane	<2	<2	<2							<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2	<2	<2							<2	ug/kg	TM15/PM10
Chloromethane #	<3	<3	<3							<3	ug/kg	TM15/PM10
Vinyl Chloride	<2	<2	<2							<2	ug/kg	TM15_A/PM10
Bromomethane	<1	<1	<1							<1	ug/kg	TM15/PM10
Chloroethane #	<2	<2	<2							<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	<2	<2	<2							<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6	<6	<6							<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	47	57	<30							<30	ug/kg	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3							<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3	<3	<3							<3	ug/kg	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3	<3							<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4	<4	<4							<4	ug/kg	TM15/PM10
Bromochloromethane #	<3	<3	<3							<3	ug/kg	TM15/PM10
Chloroform #	<3	<3	<3							<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3	<3	<3							<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3							<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4	<4	<4							<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4	<4	<4							<4	ug/kg	TM15/PM10
Benzene #	<3	<3	7							<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	<3	<3	<3							<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6	<6	<6							<6	ug/kg	TM15/PM10
Dibromomethane #	<3	<3	<3							<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3	<3	<3							<3	ug/kg	TM15/PM10
cis-1-3-Dichloropropene	<4	<4	<4							<4	ug/kg	TM15/PM10
Toluene #	4	6	6							<3	ug/kg	TM15/PM10
trans-1-3-Dichloropropene	<3	<3	<3							<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3	<3	<3							<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	<3							<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3	<3	<3							<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3	<3	<3							<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3	<3	<3							<3	ug/kg	TM15/PM10
Chlorobenzene #	<3	<3	<3							<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane	<3	<3	<3							<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	<3	5							<3	ug/kg	TM15/PM10
p/m-Xylene #	8	<5	9							<5	ug/kg	TM15/PM10
o-Xylene #	5	<3	5							<3	ug/kg	TM15/PM10
Styrene	<3	<3	<3							<3	ug/kg	TM15_A/PM10
Bromoform	<3	<3	<3							<3	ug/kg	TM15/PM10
Isopropylbenzene #	<3	<3	<3							<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3	<3	<3							<3	ug/kg	TM15/PM10
Bromobenzene	<2	<2	<2							<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4	<4	<4							<4	ug/kg	TM15/PM10
Propylbenzene #	<4	<4	<4							<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3	<3	<3							<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3	<3							<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3	<3	<3							<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5	<5	<5							<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<6	<6	<6							<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4	<4	<4							<4	ug/kg	TM15/PM10
4-Isopropyltoluene #	<4	<4	<4							<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4	<4	<4							<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4	<4	<4							<4	ug/kg	TM15/PM10
n-Butylbenzene #	<4	<4	<4							<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4	<4	<4							<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane #	<4	<4	<4							<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene #	<7	<7	<7							<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4	<4	<4							<4	ug/kg	TM15/PM10
Naphthalene	<27	<27	<27							<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene #	<7	<7	<7							<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	91	80	98							<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	82	73	80							<0	%	TM15/PM10

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
17/16146	1	WS325	0.30-0.40	3	06/10/2017	**General Description (Bulk Analysis)**	soil/stones
					06/10/2017	**Asbestos Fibres**	NAD
					06/10/2017	**Asbestos Fibres (2)**	NAD
					06/10/2017	**Asbestos ACM**	NAD
					06/10/2017	**Asbestos ACM (2)**	NAD
					06/10/2017	**Asbestos Type**	NAD
					06/10/2017	**Asbestos Type (2)**	NAD
					06/10/2017	**Asbestos Level Screen**	NAD
17/16146	1	WS326	0.70-0.80	9	06/10/2017	**General Description (Bulk Analysis)**	Soil/Stones
					06/10/2017	**Asbestos Fibres**	NAD
					06/10/2017	**Asbestos Fibres (2)**	NAD
					06/10/2017	**Asbestos ACM**	NAD
					06/10/2017	**Asbestos ACM (2)**	NAD
					06/10/2017	**Asbestos Type**	NAD
					06/10/2017	**Asbestos Type (2)**	NAD
					06/10/2017	**Asbestos Level Screen**	NAD
17/16146	1	WS332	0.70-0.80	15	06/10/2017	**General Description (Bulk Analysis)**	soil/stones
					06/10/2017	**Asbestos Fibres**	NAD
					06/10/2017	**Asbestos Fibres (2)**	NAD
					06/10/2017	**Asbestos ACM**	NAD
					06/10/2017	**Asbestos ACM (2)**	NAD
					06/10/2017	**Asbestos Type**	NAD
					06/10/2017	**Asbestos Type (2)**	NAD
					06/10/2017	**Asbestos Level Screen**	NAD
17/16146	1	WS332	2.80-3.00	21	06/10/2017	**General Description (Bulk Analysis)**	soil/stones
					06/10/2017	**Asbestos Fibres**	Fibre Bundles
					06/10/2017	**Asbestos ACM**	NAD
					06/10/2017	**Asbestos Type**	Chrysotile
					06/10/2017	**Asbestos Level Screen**	less than 0.1%
17/16146	1	WS331	0.65-0.80	24	06/10/2017	**General Description (Bulk Analysis)**	soil/stones
					06/10/2017	**Asbestos Fibres**	Fibre Bundles
					06/10/2017	**Asbestos ACM**	NAD
					06/10/2017	**Asbestos Type**	Chrysotile
					06/10/2017	**Asbestos Level Screen**	less than 0.1%

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
17/16146	1	WS330	0.50-0.60	30	06/10/2017	**General Description (Bulk Analysis)**	Soil/Stones
					06/10/2017	**Asbestos Fibres**	NAD
					06/10/2017	**Asbestos Fibres (2)**	NAD
					06/10/2017	**Asbestos ACM**	NAD
					06/10/2017	**Asbestos ACM (2)**	NAD
					06/10/2017	**Asbestos Type**	NAD
					06/10/2017	**Asbestos Type (2)**	NAD
					06/10/2017	**Asbestos Level Screen**	NAD
17/16146	1	WS327	0.60-0.75	39	06/10/2017	**General Description (Bulk Analysis)**	Soil/Stones
					06/10/2017	**Asbestos Fibres**	Fibre Bundles
					06/10/2017	**Asbestos ACM**	NAD
					06/10/2017	**Asbestos Type**	Chrysotile
					06/10/2017	**Asbestos Level Screen**	less than 0.1%

Client Name: Ramboll Environ UK Ltd

Reference: UK1522306

Location: WMI Four Ashes

Contact: Matt Royall

Matrix : Solid

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	NDP Reason
17/16146	1	WS332	2.80-3.00	19-21	Asbestos detected in sample
17/16146	1	WS331	0.65-0.80	22-24	Asbestos detected in sample
17/16146	1	WS327	0.60-0.75	37-39	Asbestos detected in sample

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 17/16146						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 17/16146

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS) accredited - UK.
SA	ISO17025 (SANAS) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution

JE Job No: 17/16146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	TM005: Modified USEPA 8015B: Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID. TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID. Including determination of BTEX and calculation of Aliphatic fractions	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5/TM36	TM005: Modified USEPA 8015B: Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID. TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID. Including determination of BTEX and calculation of Aliphatic fractions	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes

JE Job No: 17/16146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM17	Modified US EPA method 8270. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM21	Modified USEPA 415.1. Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid or water samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital shaker.			AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM62	Acid digestion of as received solid samples using Aqua Regia refluxed at 112.5 °C.			AR	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes

JE Job No: 17/16146

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM60	As received solid samples are extracted with deionised water in a 2:1 ratio of water to solid.			AR	Yes
TM42	Modified US EPA method 8270. Pesticides and herbicdes by GC-MS	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM61	As received solid samples are extracted with hot water in a 20:1 ratio of water to soil ready for analysis by ICP.			AR	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.	Yes		AR	Yes
NONE	No Method Code	NONE	No Method Code			AR	Yes
TM15_A	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

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Ramboll Environ UK Ltd
8 The Wharf
Birmingham
B1 2JS

Attention :	Matt Royall
Date :	19th October, 2017
Your reference :	UK1522306
Our reference :	Test Report 17/16473 Batch 1
Location :	WMI Four Ashes
Date samples received :	4th October, 2017
Status :	Final report
Issue :	2

Three samples were received for analysis on 4th October, 2017 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

[redacted]

Simon Gomery BSc
Project Manager

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/16473

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-6	7-9									
Sample ID	BH117	BH117	BH117									
Depth	0.50-0.60	1.65-1.75	2.80-2.95									
COC No / misc												
Containers	V J	V J	V J									
Sample Date	02/10/2017	02/10/2017	02/10/2017									
Sample Type	Soil	Soil	Soil									
Batch Number	1	1	1									
Date of Receipt	04/10/2017	04/10/2017	04/10/2017									

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
Arsenic #	4.3	24.4	1.1								<0.5	mg/kg	TM30/PM15
Beryllium	0.6	0.8	<0.5								<0.5	mg/kg	TM30/PM15
Cadmium #	0.1	0.2	<0.1								<0.1	mg/kg	TM30/PM15
Chromium #	51.8	38.4	31.0								<0.5	mg/kg	TM30/PM15
Copper #	16	41	4								<1	mg/kg	TM30/PM15
Lead #	17	38	<5								<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM30/PM15
Nickel #	11.8	18.8	7.4								<0.7	mg/kg	TM30/PM15
Selenium #	<1	1	<1								<1	mg/kg	TM30/PM15
Vanadium	16	34	12								<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.6	1.7	0.4								<0.1	mg/kg	TM74/PM32
Zinc #	43	101	17								<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03								<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05								<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.09	0.04	<0.03								<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.13	0.15	<0.03								<0.03	mg/kg	TM4/PM8
Pyrene #	0.11	0.13	<0.03								<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.09	0.11	<0.06								<0.06	mg/kg	TM4/PM8
Chrysene #	0.07	0.07	<0.02								<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	0.12	0.15	<0.07								<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.08	0.09	<0.04								<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.04	0.05	<0.04								<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04								<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.04	0.05	<0.04								<0.04	mg/kg	TM4/PM8
PAH 16 Total	0.8	0.8	<0.6								<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.09	0.11	<0.05								<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.03	0.04	<0.02								<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	94	98	98								<0	%	TM4/PM8
Methyl Tertiary Butyl Ether #	-	<2	-								<2	ug/kg	TM15/PM10
Benzene #	-	<3	-								<3	ug/kg	TM15/PM10
Toluene #	-	<3	-								<3	ug/kg	TM15/PM10
Ethylbenzene #	-	<3	-								<3	ug/kg	TM15/PM10
p/m-Xylene #	-	<5	-								<5	ug/kg	TM15/PM10
o-Xylene #	-	<3	-								<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	-	104	-								<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	-	108	-								<0	%	TM15/PM10

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/16473

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-6	7-9									
Sample ID	BH117	BH117	BH117									
Depth	0.50-0.60	1.65-1.75	2.80-2.95									
COC No / misc												
Containers	V J	V J	V J									
Sample Date	02/10/2017	02/10/2017	02/10/2017									
Sample Type	Soil	Soil	Soil									
Batch Number	1	1	1									
Date of Receipt	04/10/2017	04/10/2017	04/10/2017									

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	3.5								<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2	<0.2								<0.2	mg/kg	TM5/PM16
>C12-C16 #	<4	9	<4								<4	mg/kg	TM5/PM16
>C16-C21 #	<7	26	<7								<7	mg/kg	TM5/PM16
>C21-C35 #	<7	49	<7								<7	mg/kg	TM5/PM16
Total aliphatics C5-35	<19	84	<19								<19	mg/kg	TM5/TM36/PM12/PM16
Aromatics													
>C5-EC7 #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1	0.2								<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2								<0.2	mg/kg	TM5/PM16
>EC12-EC16 #	<4	10	<4								<4	mg/kg	TM5/PM16
>EC16-EC21 #	<7	45	<7								<7	mg/kg	TM5/PM16
>EC21-EC35 #	<7	134	<7								<7	mg/kg	TM5/PM16
Total aromatics C5-35 #	<19	189	<19								<19	mg/kg	TM5/TM36/PM12/PM16
Total aliphatics and aromatics(C5-35)	<38	273	<38								<38	mg/kg	TM5/TM36/PM12/PM16
MTBE #	<5	-	<5								<5	ug/kg	TM31/PM12
Benzene #	<5	-	<5								<5	ug/kg	TM31/PM12
Toluene #	<5	-	<5								<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	-	53								<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	-	170								<5	ug/kg	TM31/PM12
o-Xylene #	<5	-	18								<5	ug/kg	TM31/PM12
Total Phenols HPLC	<0.15	<0.15	<0.15								<0.15	mg/kg	TM26/PM21
Natural Moisture Content	7.8	22.5	19.7								<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3								<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.0099	0.0685	0.0032								<0.0015	g/l	TM38/PM20
Chromium III	51.8	38.4	31.0								<0.5	mg/kg	NONE/NONE
Total Cyanide #	<0.5	<0.5	<0.5								<0.5	mg/kg	TM89/PM45
pH #	8.17	7.59	7.97								<0.01	pH units	TM73/PM11

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/16473

VOC Report : **Solid**

J E Sample No.	4-6												
Sample ID	BH117												
Depth	1.65-1.75												
COC No / misc													
Containers	V J												
Sample Date	02/10/2017												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	04/10/2017												

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
VOC MS													
Dichlorodifluoromethane	<2										<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2										<2	ug/kg	TM15/PM10
Chloromethane #	<3										<3	ug/kg	TM15/PM10
Vinyl Chloride	<2										<2	ug/kg	TM15_A/PM10
Bromomethane	<1										<1	ug/kg	TM15/PM10
Chloroethane #	<2										<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	<2										<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6										<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<30										<30	ug/kg	TM15/PM10
trans-1-2-Dichloroethene #	<3										<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3										<3	ug/kg	TM15/PM10
cis-1-2-Dichloroethene #	<3										<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4										<4	ug/kg	TM15/PM10
Bromochloromethane #	<3										<3	ug/kg	TM15/PM10
Chloroform #	<3										<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3										<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3										<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4										<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4										<4	ug/kg	TM15/PM10
Benzene #	<3										<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	<3										<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6										<6	ug/kg	TM15/PM10
Dibromomethane #	<3										<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3										<3	ug/kg	TM15/PM10
cis-1-3-Dichloropropene	<4										<4	ug/kg	TM15/PM10
Toluene #	<3										<3	ug/kg	TM15/PM10
trans-1-3-Dichloropropene	<3										<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3										<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3										<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3										<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3										<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3										<3	ug/kg	TM15/PM10
Chlorobenzene #	<3										<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane	<3										<3	ug/kg	TM15/PM10
Ethylbenzene #	<3										<3	ug/kg	TM15/PM10
p/m-Xylene #	<5										<5	ug/kg	TM15/PM10
o-Xylene #	<3										<3	ug/kg	TM15/PM10
Styrene	<3										<3	ug/kg	TM15_A/PM10
Bromoform	<3										<3	ug/kg	TM15/PM10
Isopropylbenzene #	<3										<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3										<3	ug/kg	TM15/PM10
Bromobenzene	<2										<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4										<4	ug/kg	TM15/PM10
Propylbenzene #	<4										<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3										<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3										<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3										<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5										<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<6										<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4										<4	ug/kg	TM15/PM10
4-Isopropyltoluene #	<4										<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
n-Butylbenzene #	<4										<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane #	<4										<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene #	<7										<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4										<4	ug/kg	TM15/PM10
Naphthalene	<27										<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene #	<7										<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	104										<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	108										<0	%	TM15/PM10

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
17/16473	1	BH117	0.50-0.60	3	11/10/2017	**General Description (Bulk Analysis)**	soil/stones
					11/10/2017	**Asbestos Fibres**	NAD
					11/10/2017	**Asbestos Fibres (2)**	NAD
					11/10/2017	**Asbestos ACM**	NAD
					11/10/2017	**Asbestos ACM (2)**	NAD
					11/10/2017	**Asbestos Type**	NAD
					11/10/2017	**Asbestos Type (2)**	NAD
					11/10/2017	**Asbestos Level Screen**	NAD

Client Name: Ramboll Environ UK Ltd

Matrix : Solid

Reference: UK1522306

Location: WMI Four Ashes

Contact: Matt Royall

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
17/16473	1	BH117	0.50-0.60	1-3	EPH	Sample holding time exceeded
17/16473	1	BH117	1.65-1.75	4-6	EPH	Sample holding time exceeded
17/16473	1	BH117	2.80-2.95	7-9	EPH	Sample holding time exceeded

Due to capacity caused by increased sample numbers and instrument downtime the EPH analysis was completed one day outside of the recommended holding time. The samples were stored and subsampled under optimum laboratory conditions. The data has been checked, the chromatograms show a good shape and therefore no detectable loss of compounds. Loss of compounds would show a skewed shape to the right as the lighter fractions are lost first.

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 17/16473

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS) accredited - UK.
SA	ISO17025 (SANAS) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 17/16473

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	TM005: Modified USEPA 8015B: Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID. TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID. Including determination of BTEX and calculation of Aliphatic fractions.	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5/TM36	TM005: Modified USEPA 8015B: Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID. TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID. Including determination of BTEX and calculation of Aliphatic fractions.	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid or water samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital shaker.			AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes

JE Job No: 17/16473

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.	Yes		AR	Yes

JE Job No: 17/16473

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	NONE	No Method Code			AR	Yes
TM15_A	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

Unit 3 Deeside Point
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Deeside
CH5 2UA

Tel: +44 (0) 1244 833780
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Ramboll Environ UK Ltd
8 The Wharf
Birmingham
B1 2JS

Attention :	Matt Royall
Date :	17th October, 2017
Your reference :	UK15.22306
Our reference :	Test Report 17/16561 Batch 1
Location :	WMI Four Ashes
Date samples received :	5th October, 2017
Status :	Final report
Issue :	1

Five samples were received for analysis on 5th October, 2017 of which four were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

[redacted]

Paul Boden BSc
Project Manager

Client Name: Ramboll Environ UK Ltd
Reference: UK15.22306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/16561

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	7-9	10-12										
Sample ID	BH118	BH118A	BH118A										
Depth	0.60-0.70	1.15-1.25	2.00-2.10										
COC No / misc													
Containers	V J	V J	V J										
Sample Date	03/10/2017	04/10/2017	04/10/2017										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	05/10/2017	05/10/2017	05/10/2017										

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
Arsenic #	9.3	5.7	-								<0.5	mg/kg	TM30/PM15
Beryllium	1.3	0.8	-								<0.5	mg/kg	TM30/PM15
Cadmium #	0.6	<0.1	-								<0.1	mg/kg	TM30/PM15
Chromium #	49.4	94.2	-								<0.5	mg/kg	TM30/PM15
Copper #	108	12	-								<1	mg/kg	TM30/PM15
Lead #	136	11	-								<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	-								<0.1	mg/kg	TM30/PM15
Nickel #	23.1	14.0	-								<0.7	mg/kg	TM30/PM15
Selenium #	<1	<1	-								<1	mg/kg	TM30/PM15
Vanadium	30	25	-								<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.9	1.0	-								<0.1	mg/kg	TM74/PM32
Zinc #	267	76	-								<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	-								<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	-								<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	-								<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	-								<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.10	<0.03	-								<0.03	mg/kg	TM4/PM8
Anthracene #	0.05	<0.04	-								<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.13	<0.03	-								<0.03	mg/kg	TM4/PM8
Pyrene #	0.12	<0.03	-								<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.18	<0.06	-								<0.06	mg/kg	TM4/PM8
Chrysene #	0.12	<0.02	-								<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	0.24	<0.07	-								<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.15	<0.04	-								<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.11	<0.04	-								<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	-								<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.11	<0.04	-								<0.04	mg/kg	TM4/PM8
PAH 16 Total	1.3	<0.6	-								<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.17	<0.05	-								<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.07	<0.02	-								<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	101	101	-								<0	%	TM4/PM8

Client Name: Ramboll Environ UK Ltd
Reference: UK15.22306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/16561

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	7-9	10-12									
Sample ID	BH118	BH118A	BH118A									
Depth	0.60-0.70	1.15-1.25	2.00-2.10									
COC No / misc												
Containers	V J	V J	V J									
Sample Date	03/10/2017	04/10/2017	04/10/2017									
Sample Type	Soil	Soil	Soil									
Batch Number	1	1	1									
Date of Receipt	05/10/2017	05/10/2017	05/10/2017									

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1	-								<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1	-								<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	-								<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2	-								<0.2	mg/kg	TM5/PM16
>C12-C16 #	<4	<4	-								<4	mg/kg	TM5/PM16
>C16-C21 #	<7	<7	-								<7	mg/kg	TM5/PM16
>C21-C35 #	104	<7	-								<7	mg/kg	TM5/PM16
Total aliphatics C5-35	104	<19	-								<19	mg/kg	TM5/TM36/PM12/PM16
Aromatics													
>C5-EC7 #	<0.1	<0.1	-								<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1	-								<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1	-								<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	-								<0.2	mg/kg	TM5/PM16
>EC12-EC16 #	<4	<4	-								<4	mg/kg	TM5/PM16
>EC16-EC21 #	11	<7	-								<7	mg/kg	TM5/PM16
>EC21-EC35 #	156	<7	-								<7	mg/kg	TM5/PM16
Total aromatics C5-35 #	167	<19	-								<19	mg/kg	TM5/TM36/PM12/PM16
Total aliphatics and aromatics(C5-35)	271	<38	-								<38	mg/kg	TM5/TM36/PM12/PM16
MTBE #	<5	<5	-								<5	ug/kg	TM31/PM12
Benzene #	<5	<5	-								<5	ug/kg	TM31/PM12
Toluene #	<5	<5	-								<5	ug/kg	TM31/PM12
Ethylbenzene #	11	<5	-								<5	ug/kg	TM31/PM12
m/p-Xylene #	15	<5	-								<5	ug/kg	TM31/PM12
o-Xylene #	21	<5	-								<5	ug/kg	TM31/PM12
Total Phenols HPLC	<0.15	<0.15	-								<0.15	mg/kg	TM26/PM21
Natural Moisture Content	20.9	10.3	-								<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	-								<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.0230	0.0463	-								<0.0015	g/l	TM38/PM20
Chromium III	49.4	94.2	-								<0.5	mg/kg	NONE/NONE
Total Cyanide #	<0.5	<0.5	-								<0.5	mg/kg	TM89/PM45
Fraction Organic Carbon	-	-	0.001								<0.001	None	TM21/PM24
pH #	8.35	7.65	-								<0.01	pH units	TM73/PM11

Client Name: Ramboll Environ UK Ltd
Reference: UK15.22306
Location: WMI Four Ashes
Contact: Matt Royall

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
17/16561	1	BH118A	0.65	13	12/10/2017	**General Description (Bulk Analysis)**	Cement
					12/10/2017	**Asbestos Fibres**	NAD
					12/10/2017	**Asbestos ACM**	Asbestos Cement
					12/10/2017	**Asbestos Type**	Chrysotile
					12/10/2017	**Asbestos Level Screen**	Asbestos level cannot be determined from Screen. Quantification required.

Client Name: Ramboll Environ UK Ltd
Reference: UK15.22306
Location: WMI Four Ashes
Contact: Matt Royall

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 17/16561						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 17/16561

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

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ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

ABBREVIATIONS and ACRONYMS USED

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M	MCERTS accredited.
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NAD	No Asbestos Detected.
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NDP	No Determination Possible
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W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 17/16561

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	TM005: Modified USEPA 8015B: Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID. TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID. Including determination of BTEX and calculation of Aliphatic fractions	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5/TM36	TM005: Modified USEPA 8015B: Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID. TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID. Including determination of BTEX and calculation of Aliphatic fractions	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM21	Modified USEPA 415.1. Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid or water samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital shaker.			AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes

JE Job No: 17/16561

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.	Yes		AR	Yes
NONE	No Method Code	NONE	No Method Code			AR	Yes

Exova Jones Environmental

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Ramboll Environ UK Ltd
8 The Wharf
Birmingham
B1 2JS

Attention :	Matt Royall
Date :	20th October, 2017
Your reference :	UK1522306
Our reference :	Test Report 17/16731 Batch 1
Location :	WMI Four Ashes
Date samples received :	7th October, 2017
Status :	Final report
Issue :	1

Ten samples were received for analysis on 7th October, 2017 of which four were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

[redacted]

Simon Gomery BSc
Project Manager

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/16731

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	10-12	19-21	28-30							LOD/LOR	Units	Method No.
Sample ID	WS334	BH115	WS333	WS334A									
Depth	0.50-0.60	0.50-0.60	0.70-0.80	3.00-3.10									
COC No / misc													
Containers	V J	V J	V J	V J									
Sample Date	05/10/2017	05/10/2017	05/10/2017	05/10/2017									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	07/10/2017	07/10/2017	07/10/2017	07/10/2017									
Arsenic #	NDP	NDP	NDP	2.2							<0.5	mg/kg	TM30/PM15
Beryllium	NDP	NDP	NDP	0.5							<0.5	mg/kg	TM30/PM15
Cadmium #	NDP	NDP	NDP	<0.1							<0.1	mg/kg	TM30/PM15
Chromium #	NDP	NDP	NDP	30.1							<0.5	mg/kg	TM30/PM15
Copper #	NDP	NDP	NDP	5							<1	mg/kg	TM30/PM15
Lead #	NDP	NDP	NDP	<5							<5	mg/kg	TM30/PM15
Mercury #	NDP	NDP	NDP	<0.1							<0.1	mg/kg	TM30/PM15
Nickel #	NDP	NDP	NDP	4.8							<0.7	mg/kg	TM30/PM15
Selenium #	NDP	NDP	NDP	<1							<1	mg/kg	TM30/PM15
Vanadium	NDP	NDP	NDP	9							<1	mg/kg	TM30/PM15
Water Soluble Boron #	NDP	NDP	NDP	0.3							<0.1	mg/kg	TM74/PM32
Zinc #	NDP	NDP	NDP	7							<5	mg/kg	TM30/PM15
Arsenic	8.6	8.2	3.0	-							<0.5	mg/kg	TM30/PM62
Beryllium	1.0	1.5	0.7	-							<0.5	mg/kg	TM30/PM62
Cadmium	0.3	0.6	<0.1	-							<0.1	mg/kg	TM30/PM62
Chromium	19.4	22.4	15.1	-							<0.5	mg/kg	TM30/PM62
Copper	34	157	14	-							<1	mg/kg	TM30/PM62
Lead	55	154	12	-							<5	mg/kg	TM30/PM62
Mercury	<0.1	0.1	<0.1	-							<0.1	mg/kg	TM30/PM62
Nickel	17.0	27.4	15.9	-							<0.7	mg/kg	TM30/PM62
Selenium	<1	<1	<1	-							<1	mg/kg	TM30/PM62
Vanadium	30	34	15	-							<1	mg/kg	TM30/PM62
Water Soluble Boron	0.6	0.6	0.8	-							<0.1	mg/kg	TM74/PM61
Zinc	158	285	47	-							<5	mg/kg	TM30/PM62

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/16731

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	10-12	19-21	28-30							LOD/LOR	Units	Method No.
Sample ID	WS334	BH115	WS333	WS334A									
Depth	0.50-0.60	0.50-0.60	0.70-0.80	3.00-3.10									
COC No / misc													
Containers	V J	V J	V J	V J									
Sample Date	05/10/2017	05/10/2017	05/10/2017	05/10/2017									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	07/10/2017	07/10/2017	07/10/2017	07/10/2017									
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	0.06	<0.03	<0.03							<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05							<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.21	0.42	0.14	<0.03							<0.03	mg/kg	TM4/PM8
Anthracene #	0.06	0.13	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.30	0.79	0.14	<0.03							<0.03	mg/kg	TM4/PM8
Pyrene #	0.30	0.67	0.33	<0.03							<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.24	0.41	0.27	<0.06							<0.06	mg/kg	TM4/PM8
Chrysene #	0.21	0.35	0.46	<0.02							<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	0.27	0.69	0.27	<0.07							<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.18	0.43	0.21	<0.04							<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.10	0.23	0.05	<0.04							<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.10	0.23	0.11	<0.04							<0.04	mg/kg	TM4/PM8
PAH 16 Total	2.0	4.4	2.0	<0.6							<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.19	0.50	0.19	<0.05							<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.08	0.19	0.08	<0.02							<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	99	99	100	110							<0	%	TM4/PM8
Methyl Tertiary Butyl Ether #	-	<2	-	-							<2	ug/kg	TM15/PM10
Benzene #	-	<3	-	-							<3	ug/kg	TM15/PM10
Toluene #	-	<3	-	-							<3	ug/kg	TM15/PM10
Ethylbenzene #	-	<3	-	-							<3	ug/kg	TM15/PM10
p/m-Xylene #	-	<5	-	-							<5	ug/kg	TM15/PM10
o-Xylene #	-	<3	-	-							<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	-	83	-	-							<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	-	77	-	-							<0	%	TM15/PM10
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2	<0.2	<0.2							<0.2	mg/kg	TM5/PM16
>C12-C16 #	<4	<4	<4	<4							<4	mg/kg	TM5/PM16
>C16-C21 #	<7	<7	<7	<7							<7	mg/kg	TM5/PM16
>C21-C35 #	<7	13	<7	<7							<7	mg/kg	TM5/PM16
Total aliphatics C5-35	<19	<19	<19	<19							<19	mg/kg	TM5/TM36/PM12/PM16

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/16731

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	10-12	19-21	28-30							LOD/LOR	Units	Method No.
Sample ID	WS334	BH115	WS333	WS334A									
Depth	0.50-0.60	0.50-0.60	0.70-0.80	3.00-3.10									
COC No / misc													
Containers	V J	V J	V J	V J									
Sample Date	05/10/2017	05/10/2017	05/10/2017	05/10/2017									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	07/10/2017	07/10/2017	07/10/2017	07/10/2017									
TPH CWG													
Aromatics													
>C5-EC7 #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2	<0.2							<0.2	mg/kg	TM5/PM16
>EC12-EC16 #	<4	<4	<4	<4							<4	mg/kg	TM5/PM16
>EC16-EC21 #	<7	<7	<7	<7							<7	mg/kg	TM5/PM16
>EC21-EC35 #	<7	<7	48	<7							<7	mg/kg	TM5/PM16
Total aromatics C5-35 #	<19	<19	48	<19							<19	mg/kg	TM5/TM36/PM12/PM16
Total aliphatics and aromatics(C5-35)	<38	<38	48	<38							<38	mg/kg	TM5/TM36/PM12/PM16
MTBE #	<5	-	<5	<5							<5	ug/kg	TM31/PM12
Benzene #	<5	-	<5	<5							<5	ug/kg	TM31/PM12
Toluene #	<5	-	<5	<5							<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	-	<5	<5							<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	-	<5	<5							<5	ug/kg	TM31/PM12
o-Xylene #	<5	-	<5	<5							<5	ug/kg	TM31/PM12
Total Phenols HPLC	<0.15	<0.15	<0.15	<0.15							<0.15	mg/kg	TM26/PM21
Natural Moisture Content	NDP	NDP	NDP	27.3							<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3							<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	NDP	NDP	NDP	0.0063							<0.0015	g/l	TM38/PM20
Sulphate as SO4 (2:1 Ext)	0.0246	0.0328	0.0096	-							<0.0015	g/l	TM38/PM60
Chromium III	NDP	NDP	NDP	30.1							<0.5	mg/kg	NONE/NONE
Chromium III	19.4	22.4	15.1	-							<0.5	mg/kg	NONE/NONE
Total Cyanide #	<0.5	<0.5	<0.5	<0.5							<0.5	mg/kg	TM89/PM45
Fraction Organic Carbon	-	-	-	0.007							<0.001	None	TM21/PM24
pH #	8.06	8.18	8.57	8.16							<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/16731

VOC Report : **Solid**

J E Sample No.	10-12												
Sample ID	BH115												
Depth	0.50-0.60												
COC No / misc													
Containers	V J												
Sample Date	05/10/2017												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	07/10/2017												

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
VOC MS													
Dichlorodifluoromethane	<2										<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2										<2	ug/kg	TM15/PM10
Chloromethane #	<3										<3	ug/kg	TM15/PM10
Vinyl Chloride	<2										<2	ug/kg	TM15_A/PM10
Bromomethane	<1										<1	ug/kg	TM15/PM10
Chloroethane #	<2										<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	<2										<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6										<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<30										<30	ug/kg	TM15/PM10
trans-1-2-Dichloroethene #	<3										<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3										<3	ug/kg	TM15/PM10
cis-1-2-Dichloroethene #	<3										<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4										<4	ug/kg	TM15/PM10
Bromochloromethane #	<3										<3	ug/kg	TM15/PM10
Chloroform #	<3										<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3										<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3										<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4										<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4										<4	ug/kg	TM15/PM10
Benzene #	<3										<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	<3										<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6										<6	ug/kg	TM15/PM10
Dibromomethane #	<3										<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3										<3	ug/kg	TM15/PM10
cis-1-3-Dichloropropene	<4										<4	ug/kg	TM15/PM10
Toluene #	<3										<3	ug/kg	TM15/PM10
trans-1-3-Dichloropropene	<3										<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3										<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3										<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3										<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3										<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3										<3	ug/kg	TM15/PM10
Chlorobenzene #	<3										<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane	<3										<3	ug/kg	TM15/PM10
Ethylbenzene #	<3										<3	ug/kg	TM15/PM10
p/m-Xylene #	<5										<5	ug/kg	TM15/PM10
o-Xylene #	<3										<3	ug/kg	TM15/PM10
Styrene	<3										<3	ug/kg	TM15_A/PM10
Bromoform	<3										<3	ug/kg	TM15/PM10
Isopropylbenzene #	<3										<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3										<3	ug/kg	TM15/PM10
Bromobenzene	<2										<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4										<4	ug/kg	TM15/PM10
Propylbenzene #	<4										<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3										<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3										<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3										<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5										<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<6										<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4										<4	ug/kg	TM15/PM10
4-Isopropyltoluene #	<4										<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
n-Butylbenzene #	<4										<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane #	<4										<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene #	<7										<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4										<4	ug/kg	TM15/PM10
Naphthalene	54										<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene #	<7										<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	83										<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	77										<0	%	TM15/PM10

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
17/16731	1	WS334	0.50-0.60	3	16/10/2017	**General Description (Bulk Analysis)**	soil/stones
					16/10/2017	**Asbestos Fibres**	Fibre Bundles
					16/10/2017	**Asbestos ACM**	NAD
					16/10/2017	**Asbestos Type**	Chrysotile
					16/10/2017	**Asbestos Level Screen**	less than 0.1%
17/16731	1	BH115	0.50-0.60	12	16/10/2017	**General Description (Bulk Analysis)**	soil/stones
					16/10/2017	**Asbestos Fibres**	Fibre Bundles
					16/10/2017	**Asbestos ACM**	NAD
					16/10/2017	**Asbestos Type**	Chrysotile
					16/10/2017	**Asbestos Level Screen**	less than 0.1%
17/16731	1	WS333	0.70-0.80	21	16/10/2017	**General Description (Bulk Analysis)**	soil/stones
					16/10/2017	**Asbestos Fibres**	Fibre Bundles
					16/10/2017	**Asbestos ACM**	Asbestos Insulating Board Debris
					16/10/2017	**Asbestos Type**	Chrysotile
					16/10/2017	**Asbestos Level Screen**	less than 0.1%

Client Name: Ramboll Environ UK Ltd

Reference: UK1522306

Location: WMI Four Ashes

Contact: Matt Royall

Matrix : Solid

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	NDP Reason
17/16731	1	WS334	0.50-0.60	1-3	Asbestos detected in sample
17/16731	1	BH115	0.50-0.60	10-12	Asbestos detected in sample
17/16731	1	WS333	0.70-0.80	19-21	Asbestos detected in sample

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 17/16731						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 17/16731

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS) accredited - UK.
SA	ISO17025 (SANAS) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 17/16731

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	TM005: Modified USEPA 8015B: Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID. TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID. Including determination of BTEX and calculation of Aliphatic fractions	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5/TM36	TM005: Modified USEPA 8015B: Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID. TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID. Including determination of BTEX and calculation of Aliphatic fractions	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM21	Modified USEPA 415.1. Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid or water samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital shaker.			AR	Yes

JE Job No: 17/16731

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM62	Acid digestion of as received solid samples using Aqua Regia refluxed at 112.5 °C.			AR	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM60	As received solid samples are extracted with deionised water in a 2:1 ratio of water to solid.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	

JE Job No: 17/16731

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM61	As received solid samples are extracted with hot water in a 20:1 ratio of water to soil ready for analysis by ICP.			AR	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.	Yes		AR	Yes
NONE	No Method Code	NONE	No Method Code			AR	Yes
TM15_A	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

Exova Jones Environmental

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Ramboll Environ UK Ltd
8 The Wharf
Birmingham
B1 2JS

Attention :	Matt Royall
Date :	24th October, 2017
Your reference :	UK1522306
Our reference :	Test Report 17/16858 Batch 1
Location :	WMI Four Ashes
Date samples received :	11th October, 2017
Status :	Final report
Issue :	1

Five samples were received for analysis on 11th October, 2017 of which four were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

[redacted]

Simon Gomery BSc
Project Manager

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/16858

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-6	10-11	12-14							LOD/LOR	Units	Method No.
Sample ID	BH114	BH114	BH116	BH116									
Depth	0.2-0.4	1.0-1.2	0.5-0.7	1.0-1.2									
COC No / misc													
Containers	V J	V J	V J	V J									
Sample Date	09/10/2017	09/10/2017	10/10/2017	10/10/2017									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	11/10/2017	11/10/2017	11/10/2017	11/10/2017									
Arsenic #	7.0	4.2	3.2	3.2							<0.5	mg/kg	TM30/PM15
Beryllium	0.7	1.1	<0.5	1.3							<0.5	mg/kg	TM30/PM15
Cadmium #	0.3	<0.1	<0.1	<0.1							<0.1	mg/kg	TM30/PM15
Chromium #	44.5	46.4	33.3	31.2							<0.5	mg/kg	TM30/PM15
Copper #	14	12	2	5							<1	mg/kg	TM30/PM15
Lead #	31	<5	<5	<5							<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM30/PM15
Nickel #	9.9	22.6	5.1	9.2							<0.7	mg/kg	TM30/PM15
Selenium #	<1	1	<1	<1							<1	mg/kg	TM30/PM15
Vanadium	17	33	12	22							<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.6	0.2	0.2	0.3							<0.1	mg/kg	TM74/PM32
Zinc #	52	37	<5	11							<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03							<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05							<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	<0.03	<0.03	<0.03							<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	<0.03	<0.03	<0.03							<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	<0.03	<0.03	<0.03							<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06 B	<0.06	<0.06	<0.06							<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02 B	<0.02	<0.02	<0.02							<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<0.07	<0.07	<0.07							<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	<0.6	<0.6	<0.6							<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	<0.05	<0.05							<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	<0.02	<0.02							<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	94	96	100	96							<0	%	TM4/PM8
Methyl Tertiary Butyl Ether #	-	<2	-	-							<2	ug/kg	TM15/PM10
Benzene #	-	<3	-	-							<3	ug/kg	TM15/PM10
Toluene #	-	<3	-	-							<3	ug/kg	TM15/PM10
Ethylbenzene #	-	<3	-	-							<3	ug/kg	TM15/PM10
p/m-Xylene #	-	<5	-	-							<5	ug/kg	TM15/PM10
o-Xylene #	-	<3	-	-							<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	-	115	-	-							<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	-	145	-	-							<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/16858

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-6	10-11	12-14							LOD/LOR	Units	Method No.
Sample ID	BH114	BH114	BH116	BH116									
Depth	0.2-0.4	1.0-1.2	0.5-0.7	1.0-1.2									
COC No / misc													
Containers	V J	V J	V J	V J									
Sample Date	09/10/2017	09/10/2017	10/10/2017	10/10/2017									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	11/10/2017	11/10/2017	11/10/2017	11/10/2017									
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1 SV	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1 SV	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1 SV	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2	<0.2	<0.2							<0.2	mg/kg	TM5/PM16
>C12-C16 #	<4	<4	<4	<4							<4	mg/kg	TM5/PM16
>C16-C21 #	<7	<7	<7	<7							<7	mg/kg	TM5/PM16
>C21-C35 #	<7	<7	<7	<7							<7	mg/kg	TM5/PM16
Total aliphatics C5-35	<19	<19	<19	<19							<19	mg/kg	TM5/TM36/PM12/PM16
Aromatics													
>C5-EC7 #	<0.1	<0.1 SV	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1 SV	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1 SV	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2	<0.2							<0.2	mg/kg	TM5/PM16
>EC12-EC16 #	<4	<4	<4	<4							<4	mg/kg	TM5/PM16
>EC16-EC21 #	<7	<7	<7	<7							<7	mg/kg	TM5/PM16
>EC21-EC35 #	13	<7	<7	<7							<7	mg/kg	TM5/PM16
Total aromatics C5-35 #	<19	<19	<19	<19							<19	mg/kg	TM5/TM36/PM12/PM16
Total aliphatics and aromatics(C5-35)	<38	<38	<38	<38							<38	mg/kg	TM5/TM36/PM12/PM16
MTBE #	<5	-	<5	<5							<5	ug/kg	TM31/PM12
Benzene #	<5	-	<5	<5							<5	ug/kg	TM31/PM12
Toluene #	<5	-	<5	<5							<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	-	<5	<5							<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	-	<5	<5							<5	ug/kg	TM31/PM12
o-Xylene #	<5	-	<5	<5							<5	ug/kg	TM31/PM12
Total Phenols HPLC	<0.15	<0.15	<0.15	<0.15							<0.15	mg/kg	TM26/PM21
Natural Moisture Content	16.6	18.8	18.9	13.1							<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3							<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	<0.0015	0.0481	0.0047	0.0179							<0.0015	g/l	TM38/PM20
Chromium III	44.5	46.4	33.3	31.2							<0.5	mg/kg	NONE/NONE
Total Cyanide #	1.0	<0.5	<0.5	<0.5							<0.5	mg/kg	TM89/PM45
Fraction Organic Carbon	-	-	0.001	-							<0.001	None	TM21/PM24
pH #	6.50	7.38	6.70	4.90							<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall
JE Job No.: 17/16858

VOC Report : **Solid**

J E Sample No.	4-6												
Sample ID	BH114												
Depth	1.0-1.2												
COC No / misc													
Containers	V J												
Sample Date	09/10/2017												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	11/10/2017												

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
VOC MS													
Dichlorodifluoromethane	<2										<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2										<2	ug/kg	TM15/PM10
Chloromethane #	<3										<3	ug/kg	TM15/PM10
Vinyl Chloride	<2										<2	ug/kg	TM15_A/PM10
Bromomethane	<1										<1	ug/kg	TM15/PM10
Chloroethane #	<2										<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	<2										<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6										<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<30										<30	ug/kg	TM15/PM10
trans-1-2-Dichloroethene #	<3										<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3										<3	ug/kg	TM15/PM10
cis-1-2-Dichloroethene #	<3										<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4										<4	ug/kg	TM15/PM10
Bromochloromethane #	<3										<3	ug/kg	TM15/PM10
Chloroform #	<3										<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3										<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3										<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4										<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4										<4	ug/kg	TM15/PM10
Benzene #	<3										<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	<3										<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6										<6	ug/kg	TM15/PM10
Dibromomethane #	<3										<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3										<3	ug/kg	TM15/PM10
cis-1-3-Dichloropropene	<4										<4	ug/kg	TM15/PM10
Toluene #	<3										<3	ug/kg	TM15/PM10
trans-1-3-Dichloropropene	<3										<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3										<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3										<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3										<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3										<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3										<3	ug/kg	TM15/PM10
Chlorobenzene #	<3										<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane	<3										<3	ug/kg	TM15/PM10
Ethylbenzene #	<3										<3	ug/kg	TM15/PM10
p/m-Xylene #	<5										<5	ug/kg	TM15/PM10
o-Xylene #	<3										<3	ug/kg	TM15/PM10
Styrene	<3										<3	ug/kg	TM15_A/PM10
Bromoform	<3										<3	ug/kg	TM15/PM10
Isopropylbenzene #	<3										<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3										<3	ug/kg	TM15/PM10
Bromobenzene	<2										<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4										<4	ug/kg	TM15/PM10
Propylbenzene #	<4										<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3										<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3										<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3										<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5										<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<6										<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4										<4	ug/kg	TM15/PM10
4-Isopropyltoluene #	<4										<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
n-Butylbenzene #	<4										<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane #	<4										<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene #	<7										<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4										<4	ug/kg	TM15/PM10
Naphthalene	<27										<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene #	<7										<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	115										<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	145										<0	%	TM15/PM10

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
17/16858	1	BH114	0.2-0.4	3	18/10/2017	**General Description (Bulk Analysis)**	soil/stones
					18/10/2017	**Asbestos Fibres**	NAD
					18/10/2017	**Asbestos Fibres (2)**	NAD
					18/10/2017	**Asbestos ACM**	NAD
					18/10/2017	**Asbestos ACM (2)**	NAD
					18/10/2017	**Asbestos Type**	NAD
					18/10/2017	**Asbestos Type (2)**	NAD
					18/10/2017	**Asbestos Level Screen**	NAD
17/16858	1	BH116	0.5-0.7	11	18/10/2017	**General Description (Bulk Analysis)**	soil/stones
					18/10/2017	**Asbestos Fibres**	NAD
					18/10/2017	**Asbestos Fibres (2)**	NAD
					18/10/2017	**Asbestos ACM**	NAD
					18/10/2017	**Asbestos ACM (2)**	NAD
					18/10/2017	**Asbestos Type**	NAD
					18/10/2017	**Asbestos Type (2)**	NAD
					18/10/2017	**Asbestos Level Screen**	NAD

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Matt Royall

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 17/16858						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 17/16858

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS) accredited - UK.
SA	ISO17025 (SANAS) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 17/16858

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	TM005: Modified USEPA 8015B: Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID. TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID. Including determination of BTEX and calculation of Aliphatic fractions	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5/TM36	TM005: Modified USEPA 8015B: Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID. TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID. Including determination of BTEX and calculation of Aliphatic fractions	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM21	Modified USEPA 415.1. Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid or water samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital shaker.			AR	Yes

JE Job No: 17/16858

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes

JE Job No: 17/16858

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.	Yes		AR	Yes
NONE	No Method Code	NONE	No Method Code			AR	Yes
TM15_A	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

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Ramboll Environ UK Ltd
Corner Block
2 Cornwall Street
Birmingham
B3 2DX

Attention :	Emily Betts
Date :	9th November, 2017
Your reference :	UK1522306
Our reference :	Test Report 17/17829 Batch 1
Location :	WMI Four Ashes
Date samples received :	27th October, 2017
Status :	Final report
Issue :	1

Four samples were received for analysis on 27th October, 2017 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

[redacted]

Paul Boden BSc
Project Manager

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Emily Betts
JE Job No.: 17/17829

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-3	4-6									LOD/LOR	Units	Method No.
Sample ID	WS328	WS328											
Depth	0.4-0.5	0.75-0.85											
COC No / misc													
Containers	V J	V J											
Sample Date	26/10/2017	26/10/2017											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	27/10/2017	27/10/2017											
Arsenic #	4.1	3.0									<0.5	mg/kg	TM30/PM15
Beryllium	<0.5	1.5									<0.5	mg/kg	TM30/PM15
Cadmium #	0.1	<0.1									<0.1	mg/kg	TM30/PM15
Chromium #	38.8	50.0									<0.5	mg/kg	TM30/PM15
Copper #	6	9									<1	mg/kg	TM30/PM15
Lead #	9	<5									<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1									<0.1	mg/kg	TM30/PM15
Nickel #	12.3	16.6									<0.7	mg/kg	TM30/PM15
Selenium #	<1	<1									<1	mg/kg	TM30/PM15
Vanadium	22	24									<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.4	0.7									<0.1	mg/kg	TM74/PM32
Zinc #	30	18									<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03									<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05									<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.03	<0.03									<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	<0.03									<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	<0.03									<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06									<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	<0.02									<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<0.07									<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	<0.6									<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05									<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02									<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	108	86									<0	%	TM4/PM8
Methyl Tertiary Butyl Ether #	-	<2									<2	ug/kg	TM15/PM10
Benzene #	-	<3									<3	ug/kg	TM15/PM10
Toluene #	-	<3									<3	ug/kg	TM15/PM10
Ethylbenzene #	-	<3									<3	ug/kg	TM15/PM10
p/m-Xylene #	-	<5									<5	ug/kg	TM15/PM10
o-Xylene #	-	<3									<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	-	114									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	-	139									<0	%	TM15/PM10

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Emily Betts
JE Job No.: 17/17829

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-6									LOD/LOR	Units	Method No.
Sample ID	WS328	WS328											
Depth	0.4-0.5	0.75-0.85											
COC No / misc													
Containers	V J	V J											
Sample Date	26/10/2017	26/10/2017											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	27/10/2017	27/10/2017											
Pesticides													
Organochlorine Pesticides													
Aldrin	<10	-									<10	ug/kg	TM42/PM8
Alpha-HCH (BHC)	<10	-									<10	ug/kg	TM42/PM8
Beta-HCH (BHC)	<10	-									<10	ug/kg	TM42/PM8
Delta-HCH (BHC)	<10	-									<10	ug/kg	TM42/PM8
Dieldrin	<10	-									<10	ug/kg	TM42/PM8
Endosulphan I	<10	-									<10	ug/kg	TM42/PM8
Endosulphan II	<10	-									<10	ug/kg	TM42/PM8
Endosulphan sulphate	<10	-									<10	ug/kg	TM42/PM8
Endrin	<10	-									<10	ug/kg	TM42/PM8
Gamma-HCH (BHC)	<10	-									<10	ug/kg	TM42/PM8
Heptachlor	<10	-									<10	ug/kg	TM42/PM8
Heptachlor Epoxide	<10	-									<10	ug/kg	TM42/PM8
p,p'-DDE	<10	-									<10	ug/kg	TM42/PM8
p,p'-DDT	44	-									<10	ug/kg	TM42/PM8
p,p'-TDE	<10	-									<10	ug/kg	TM42/PM8
Total Methoxychlor	<10	-									<10	ug/kg	TM42/PM8
Organophosphorus Pesticides													
Azinphos methyl	<10	-									<10	ug/kg	TM42/PM8
Diazinon	<10	-									<10	ug/kg	TM42/PM8
Dichlorvos	<10	-									<10	ug/kg	TM42/PM8
Disulfoton	<10	-									<10	ug/kg	TM42/PM8
Ethion	<10	-									<10	ug/kg	TM42/PM8
Ethyl Parathion (Parathion)	<10	-									<10	ug/kg	TM42/PM8
Fenitrothion	<10	-									<10	ug/kg	TM42/PM8
Malathion	<10	-									<10	ug/kg	TM42/PM8
Methyl Parathion	<10	-									<10	ug/kg	TM42/PM8
Mevinphos	<10	-									<10	ug/kg	TM42/PM8
2,3,6 - TBA	<0.1	-									<0.1	mg/kg	TM42/PM8
2,4 - D	<0.1	-									<0.1	mg/kg	TM42/PM8
2,4 - DB	<0.1	-									<0.1	mg/kg	TM42/PM8
2,4,5 - T	<0.1	-									<0.1	mg/kg	TM42/PM8
4 - CPA	<0.1	-									<0.1	mg/kg	TM42/PM8
Benazolin	<0.1	-									<0.1	mg/kg	TM42/PM8
Bentazone	<0.1	-									<0.1	mg/kg	TM42/PM8
Bromoxynil	<0.1	-									<0.1	mg/kg	TM42/PM8
Clopyralid	<0.1	-									<0.1	mg/kg	TM42/PM8
Dicamba	<0.1	-									<0.1	mg/kg	TM42/PM8
Dichloroprop	<0.1	-									<0.1	mg/kg	TM42/PM8
Diclofop	<0.1	-									<0.1	mg/kg	TM42/PM8
Fenoprop	<0.1	-									<0.1	mg/kg	TM42/PM8
Flamprop	<0.1	-									<0.1	mg/kg	TM42/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Emily Betts
JE Job No.: 17/17829

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-6									LOD/LOR	Units	Method No.
Sample ID	WS328	WS328											
Depth	0.4-0.5	0.75-0.85											
COC No / misc													
Containers	V J	V J											
Sample Date	26/10/2017	26/10/2017											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	27/10/2017	27/10/2017											
Flamprop – isopropyl	<0.1	-									<0.1	mg/kg	TM42/PM8
Ioxynil	<0.1	-									<0.1	mg/kg	TM42/PM8
MCPA	<0.1	-									<0.1	mg/kg	TM42/PM8
MCPB	<0.1	-									<0.1	mg/kg	TM42/PM8
Mecoprop	<0.1	-									<0.1	mg/kg	TM42/PM8
Pentachlorophenol	<0.1	-									<0.1	mg/kg	TM42/PM8
Picloram	<0.1	-									<0.1	mg/kg	TM42/PM8
Triclopyr	<0.1	-									<0.1	mg/kg	TM42/PM8
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1 SV									<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1 SV									<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1 SV									<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2									<0.2	mg/kg	TM5/PM16
>C12-C16 #	<4	<4									<4	mg/kg	TM5/PM16
>C16-C21 #	<7	<7									<7	mg/kg	TM5/PM16
>C21-C35 #	<7	<7									<7	mg/kg	TM5/PM16
Total aliphatics C5-35	<19	<19									<19	mg/kg	TM5/TM36/PM12/PM16
Aromatics													
>C5-EC7 #	<0.1	<0.1 SV									<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1 SV									<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1 SV									<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2									<0.2	mg/kg	TM5/PM16
>EC12-EC16 #	<4	<4									<4	mg/kg	TM5/PM16
>EC16-EC21 #	<7	<7									<7	mg/kg	TM5/PM16
>EC21-EC35 #	<7	<7									<7	mg/kg	TM5/PM16
Total aromatics C5-35 #	<19	<19									<19	mg/kg	TM5/TM36/PM12/PM16
Total aliphatics and aromatics(C5-35)	<38	<38									<38	mg/kg	TM5/TM36/PM12/PM16
MTBE #	<5	-									<5	ug/kg	TM31/PM12
Benzene #	<5	-									<5	ug/kg	TM31/PM12
Toluene #	<5	-									<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	-									<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	-									<5	ug/kg	TM31/PM12
o-Xylene #	<5	-									<5	ug/kg	TM31/PM12
Total Phenols HPLC	<0.15	<0.15									<0.15	mg/kg	TM26/PM21
Natural Moisture Content	10.5	13.9									<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3									<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	<0.0015	0.0162									<0.0015	g/l	TM38/PM20
Chromium III	38.8	50.0									<0.5	mg/kg	NONE/NONE

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Emily Betts
JE Job No.: 17/17829

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-3	4-6									LOD/LOR	Units	Method No.
Sample ID	WS328	WS328											
Depth	0.4-0.5	0.75-0.85											
COC No / misc													
Containers	V J	V J											
Sample Date	26/10/2017	26/10/2017											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	27/10/2017	27/10/2017											
Total Cyanide #	<0.5	<0.5									<0.5	mg/kg	TM89/PM45
pH #	6.57	6.61									<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Emily Betts
JE Job No.: 17/17829

VOC Report : **Solid**

J E Sample No.	4-6												
Sample ID	WS328												
Depth	0.75-0.85												
COC No / misc													
Containers	V J												
Sample Date	26/10/2017												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	27/10/2017												

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
VOC MS													
Dichlorodifluoromethane	<2										<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2										<2	ug/kg	TM15/PM10
Chloromethane #	<3										<3	ug/kg	TM15/PM10
Vinyl Chloride	<2										<2	ug/kg	TM15_A/PM10
Bromomethane	<1										<1	ug/kg	TM15/PM10
Chloroethane #	<2										<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	<2										<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6										<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<30										<30	ug/kg	TM15/PM10
trans-1-2-Dichloroethene #	<3										<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3										<3	ug/kg	TM15/PM10
cis-1-2-Dichloroethene #	<3										<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4										<4	ug/kg	TM15/PM10
Bromochloromethane #	<3										<3	ug/kg	TM15/PM10
Chloroform #	<3										<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3										<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3										<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4										<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4										<4	ug/kg	TM15/PM10
Benzene #	<3										<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	<3										<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6										<6	ug/kg	TM15/PM10
Dibromomethane #	<3										<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3										<3	ug/kg	TM15/PM10
cis-1-3-Dichloropropene	<4										<4	ug/kg	TM15/PM10
Toluene #	<3										<3	ug/kg	TM15/PM10
trans-1-3-Dichloropropene	<3										<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3										<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3										<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3										<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3										<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3										<3	ug/kg	TM15/PM10
Chlorobenzene #	<3										<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane	<3										<3	ug/kg	TM15/PM10
Ethylbenzene #	<3										<3	ug/kg	TM15/PM10
p/m-Xylene #	<5										<5	ug/kg	TM15/PM10
o-Xylene #	<3										<3	ug/kg	TM15/PM10
Styrene	<3										<3	ug/kg	TM15_A/PM10
Bromoform	<3										<3	ug/kg	TM15/PM10
Isopropylbenzene #	<3										<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3										<3	ug/kg	TM15/PM10
Bromobenzene	<2										<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4										<4	ug/kg	TM15/PM10
Propylbenzene #	<4										<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3										<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3										<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3										<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5										<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<6										<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4										<4	ug/kg	TM15/PM10
4-Isopropyltoluene #	<4										<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
n-Butylbenzene #	<4										<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4										<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane #	<4										<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene #	<7										<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4										<4	ug/kg	TM15/PM10
Naphthalene	<27										<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene #	<7										<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	114										<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	139										<0	%	TM15/PM10

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Emily Betts

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
17/17829	1	WS328	0.4-0.5	3	06/11/2017	**General Description (Bulk Analysis)**	Soil/Stones
					06/11/2017	**Asbestos Fibres**	NAD
					06/11/2017	**Asbestos Fibres (2)**	NAD
					06/11/2017	**Asbestos ACM**	NAD
					06/11/2017	**Asbestos ACM (2)**	NAD
					06/11/2017	**Asbestos Type**	NAD
					06/11/2017	**Asbestos Type (2)**	NAD
					06/11/2017	**Asbestos Level Screen**	NAD

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Emily Betts

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 17/17829						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 17/17829

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 17/17829

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	TM005: Modified USEPA 8015B: Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID. TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID. Including determination of BTEX and calculation of Aliphatic fractions.	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5/TM36	TM005: Modified USEPA 8015B: Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID. TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID. Including determination of BTEX and calculation of Aliphatic fractions.	PM12/PM16	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis./Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid or water samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital shaker.			AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes

JE Job No: 17/17829

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM42	Modified US EPA method 8270. Pesticides and herbicdes by GC-MS	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes

JE Job No: 17/17829

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.	Yes		AR	Yes
NONE	No Method Code	NONE	No Method Code			AR	Yes
TM15_A	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

APPENDIX 4
LABORATORY WATER ANALYTICAL DATA

Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

Tel: +44 (0) 1244 833780
Fax: +44 (0) 1244 833781

Ramboll Environ UK Ltd
Corner Block
2 Cornwall Street
Birmingham
B3 2DX

Attention :	Emily Betts
Date :	3rd November, 2017
Your reference :	UK1522306
Our reference :	Test Report 17/17413 Batch 1
Location :	WM1-Four Ashes
Date samples received :	20th October, 2017
Status :	Final report
Issue :	1

Twelve samples were received for analysis on 20th October, 2017 of which twelve were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

[redacted]

Paul Boden BSc
Project Manager

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WM1-Four Ashes
Contact: Emily Betts
JE Job No.: 17/17413

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, HN=$HN0_3$

Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-10	11-20	21-29	31-40	41-50	51-60	61-69	70-78	79-87	88-97	LOD/LOR	Units	Method No.
Sample ID	BH230	BH233	BH231	BH118	BH116	BH114	BH226	WS331	BH115	BH229			
Depth													
COC No / misc													
Containers	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G			
Sample Date	19/10/2017	18/10/2017	18/10/2017	18/10/2017	19/10/2017	19/10/2017	19/10/2017	18/10/2017	18/10/2017	18/10/2017			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	20/10/2017	20/10/2017	20/10/2017	20/10/2017	20/10/2017	20/10/2017	20/10/2017	20/10/2017	20/10/2017	20/10/2017			
Dissolved Arsenic #	<2.5	8.4	3.1	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	ug/l	TM30/PM14
Dissolved Beryllium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	14.6	<0.5	<0.5	0.9	<0.5	ug/l	TM30/PM14
Dissolved Boron	110	355	577	204	51	46	89	157	417	82	<12	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.4	<0.5	ug/l	TM30/PM14
Total Dissolved Chromium #	<1.5	<1.5	3.4	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	ug/l	TM30/PM14
Dissolved Copper #	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	ug/l	TM30/PM14
Dissolved Lead #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM30/PM14
Dissolved Nickel #	6	<2	<2	6	7	<2	23	<2	3	30	<2	ug/l	TM30/PM14
Dissolved Selenium #	<3	<3	<3	<3	<3	11	<3	<3	<3	<3	<3	ug/l	TM30/PM14
Dissolved Vanadium #	<1.5	3.3	2.2	<1.5	<1.5	<1.5	<1.5	2.0	1.7	<1.5	<1.5	ug/l	TM30/PM14
Dissolved Zinc #	319	<3	27	<3	4	<3	9	<3	7	125	<3	ug/l	TM30/PM14
Total Hardness Dissolved (as CaCO3)	161	299	485	427	50	68	111	243	310	315	<1	mg/l	TM30/PM14
PAH MS													
Naphthalene #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.8	<0.1	<0.1	<0.1	ug/l	TM4/PM30
Acenaphthylene #	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	0.013	<0.013	ug/l	TM4/PM30
Acenaphthene #	<0.013	0.080	0.115	<0.013	<0.013	<0.013	<0.013	0.365	<0.013	0.053	<0.013	ug/l	TM4/PM30
Fluorene #	<0.014	0.044	0.031	<0.014	<0.014	<0.014	<0.014	0.185	<0.014	0.032	<0.014	ug/l	TM4/PM30
Phenanthrene #	<0.011	0.115	0.133	<0.011	<0.011	<0.011	<0.011	0.410	0.014	0.053	<0.011	ug/l	TM4/PM30
Anthracene #	<0.013	0.024	0.030	<0.013	<0.013	<0.013	<0.013	0.084	0.015	<0.013	<0.013	ug/l	TM4/PM30
Fluoranthene #	<0.012	0.113	0.037	<0.012	<0.012	<0.012	<0.012	0.134	0.025	<0.012	<0.012	ug/l	TM4/PM30
Pyrene #	<0.013	0.095	0.041	<0.013	<0.013	<0.013	<0.013	0.103	0.021	<0.013	<0.013	ug/l	TM4/PM30
Benzo(a)anthracene #	<0.015	0.033	<0.015	<0.015	<0.015	<0.015	<0.015	0.034	<0.015	<0.015	<0.015	ug/l	TM4/PM30
Chrysene #	<0.011	0.034	0.015	<0.011	<0.011	<0.011	<0.011	0.046	<0.011	<0.011	<0.011	ug/l	TM4/PM30
Benzo(bk)fluoranthene #	<0.018	0.044	<0.018	<0.018	<0.018	<0.018	<0.018	0.035	<0.018	<0.018	<0.018	ug/l	TM4/PM30
Benzo(a)pyrene #	<0.016	0.023	<0.016	<0.016	<0.016	<0.016	<0.016	0.020	<0.016	<0.016	<0.016	ug/l	TM4/PM30
Indeno(123cd)pyrene #	<0.011	0.016	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	ug/l	TM4/PM30
Benzo(ghi)perylene #	<0.011	0.017	<0.011	<0.011	<0.011	<0.011	<0.011	0.011	<0.011	<0.011	<0.011	ug/l	TM4/PM30
PAH 16 Total #	<0.195	0.638	0.402	<0.195	<0.195	<0.195	<0.195	2.227	<0.195	<0.195	<0.195	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	ug/l	TM4/PM30
PAH Surrogate % Recovery	74	77	82	74	77	74	79	79	82	78	<0	%	TM4/PM30
Methyl Tertiary Butyl Ether #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM15/PM10
Toluene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
p/m-Xylene #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
o-Xylene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	95	101	101	95	95	97	104	106	103	101	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	100	102	100	100	104	102	100	102	102	101	<0	%	TM15/PM10

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WM1-Four Ashes
Contact: Emily Betts
JE Job No.: 17/17413

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Depth													
COC No / misc													
Containers	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G			
Sample Date	19/10/2017	18/10/2017	18/10/2017	18/10/2017	19/10/2017	19/10/2017	19/10/2017	18/10/2017	18/10/2017	18/10/2017			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	20/10/2017	20/10/2017	20/10/2017	20/10/2017	20/10/2017	20/10/2017	20/10/2017	20/10/2017	20/10/2017	20/10/2017			
Pesticides													
Organochlorine Pesticides													
Aldrin	<0.01	<0.01	-	-	<0.01	<0.01	-	-	-	<0.01	<0.01	ug/l	TM149/PM30
Alpha-HCH (BHC)	<0.01	<0.01	-	-	<0.01	<0.01	-	-	-	<0.01	<0.01	ug/l	TM149/PM30
Beta-HCH (BHC)	<0.01	<0.01	-	-	<0.01	<0.01	-	-	-	<0.01	<0.01	ug/l	TM149/PM30
Delta-HCH (BHC)	<0.01	<0.01	-	-	<0.01	<0.01	-	-	-	<0.01	<0.01	ug/l	TM149/PM30
Dieldrin	<0.01	<0.01	-	-	<0.01	<0.01	-	-	-	<0.01	<0.01	ug/l	TM149/PM30
Endosulphan I	<0.01	<0.01	-	-	<0.01	<0.01	-	-	-	<0.01	<0.01	ug/l	TM149/PM30
Endosulphan II	<0.01	<0.01	-	-	<0.01	<0.01	-	-	-	<0.01	<0.01	ug/l	TM149/PM30
Endosulphan sulphate	<0.01	<0.01	-	-	<0.01	<0.01	-	-	-	<0.01	<0.01	ug/l	TM149/PM30
Endrin	<0.01	<0.01	-	-	<0.01	<0.01	-	-	-	<0.01	<0.01	ug/l	TM149/PM30
Gamma-HCH (BHC)	<0.01	<0.01	-	-	<0.01	<0.01	-	-	-	<0.01	<0.01	ug/l	TM149/PM30
Heptachlor	<0.01	<0.01	-	-	<0.01	<0.01	-	-	-	<0.01	<0.01	ug/l	TM149/PM30
Heptachlor Epoxide	<0.01	<0.01	-	-	<0.01	<0.01	-	-	-	<0.01	<0.01	ug/l	TM149/PM30
o,p'-Methoxychlor	<0.01	<0.01	-	-	<0.01	<0.01	-	-	-	<0.01	<0.01	ug/l	TM149/PM30
p,p'-DDE	<0.01	<0.01	-	-	<0.01	<0.01	-	-	-	<0.01	<0.01	ug/l	TM149/PM30
p,p'-DDT	<0.01	<0.01	-	-	<0.01	<0.01	-	-	-	<0.01	<0.01	ug/l	TM149/PM30
p,p'-Methoxychlor	<0.01	<0.01	-	-	<0.01	<0.01	-	-	-	<0.01	<0.01	ug/l	TM149/PM30
p,p'-TDE	<0.01	<0.01	-	-	<0.01	<0.01	-	-	-	<0.01	<0.01	ug/l	TM149/PM30
Organophosphorus Pesticides													
Azinphos methyl	<0.01	<0.01	-	-	<0.01	<0.01	-	-	-	<0.01	<0.01	ug/l	TM149/PM30
Diazinon	<0.01	<0.01	-	-	<0.01	<0.01	-	-	-	<0.01	<0.01	ug/l	TM149/PM30
Dichlorvos	<0.01	<0.01	-	-	<0.01	<0.01	-	-	-	<0.01	<0.01	ug/l	TM149/PM30
Disulfoton	<0.01	<0.01	-	-	<0.01	<0.01	-	-	-	<0.01	<0.01	ug/l	TM149/PM30
Ethion	<0.01	<0.01	-	-	<0.01	<0.01	-	-	-	<0.01	<0.01	ug/l	TM149/PM30
Ethyl Parathion (Parathion)	<0.01	<0.01	-	-	<0.01	<0.01	-	-	-	<0.01	<0.01	ug/l	TM149/PM30
Fenitrothion	<0.01	<0.01	-	-	<0.01	<0.01	-	-	-	<0.01	<0.01	ug/l	TM149/PM30
Malathion	<0.01	<0.01	-	-	<0.01	<0.01	-	-	-	<0.01	<0.01	ug/l	TM149/PM30
Methyl Parathion	<0.01	<0.01	-	-	<0.01	<0.01	-	-	-	<0.01	<0.01	ug/l	TM149/PM30
Mevinphos	<0.01	<0.01	-	-	<0.01	<0.01	-	-	-	<0.01	<0.01	ug/l	TM149/PM30
Benazolin	<0.1	<0.1	-	-	<0.1	<0.1	-	-	-	<0.1	<0.1	ug/l	TM42/PM30
Bentazone	<0.1	<0.1	-	-	<0.1	<0.1	-	-	-	<0.1	<0.1	ug/l	TM42/PM30
Bromoxynil	<0.1	<0.1	-	-	<0.1	<0.1	-	-	-	<0.1	<0.1	ug/l	TM42/PM30
Clopyralid	<0.1	<0.1	-	-	<0.1	<0.1	-	-	-	<0.1	<0.1	ug/l	TM42/PM30
4 - CPA	<0.1	<0.1	-	-	<0.1	<0.1	-	-	-	<0.1	<0.1	ug/l	TM42/PM30
2,4 - D	<0.1	<0.1	-	-	<0.1	<0.1	-	-	-	<0.1	<0.1	ug/l	TM42/PM30
2,4 - DB	<0.1	<0.1	-	-	<0.1	<0.1	-	-	-	<0.1	<0.1	ug/l	TM42/PM30
Dicamba	<0.1	<0.1	-	-	<0.1	<0.1	-	-	-	<0.1	<0.1	ug/l	TM42/PM30
Dichloroprop	<0.1	<0.1	-	-	<0.1	<0.1	-	-	-	<0.1	<0.1	ug/l	TM42/PM30
Diclofop	<0.1	<0.1	-	-	<0.1	<0.1	-	-	-	<0.1	<0.1	ug/l	TM42/PM30
Fenoprop	<0.1	<0.1	-	-	<0.1	<0.1	-	-	-	<0.1	<0.1	ug/l	TM42/PM30
Flamprop	<0.1	<0.1	-	-	<0.1	<0.1	-	-	-	<0.1	<0.1	ug/l	TM42/PM30
Flamprop – isopropyl	<0.1	<0.1	-	-	<0.1	<0.1	-	-	-	<0.1	<0.1	ug/l	TM42/PM30

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WM1-Four Ashes
Contact: Emily Betts
JE Job No.: 17/17413

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
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Sample Date	19/10/2017	18/10/2017	18/10/2017	18/10/2017	19/10/2017	19/10/2017	19/10/2017	18/10/2017	18/10/2017	18/10/2017			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	20/10/2017	20/10/2017	20/10/2017	20/10/2017	20/10/2017	20/10/2017	20/10/2017	20/10/2017	20/10/2017	20/10/2017			
loxynil	<0.1	<0.1	-	-	<0.1	<0.1	-	-	-	<0.1	<0.1	ug/l	TM42/PM30
MCPA	<0.1	<0.1	-	-	<0.1	<0.1	-	-	-	<0.1	<0.1	ug/l	TM42/PM30
MCPB	<0.1	<0.1	-	-	<0.1	<0.1	-	-	-	<0.1	<0.1	ug/l	TM42/PM30
Mecoprop	<0.1	<0.1	-	-	<0.1	<0.1	-	-	-	<0.1	<0.1	ug/l	TM42/PM30
Picloram	<0.1	<0.1	-	-	<0.1	<0.1	-	-	-	<0.1	<0.1	ug/l	TM42/PM30
Pentachlorophenol	<0.1	<0.1	-	-	<0.1	<0.1	-	-	-	<0.1	<0.1	ug/l	TM42/PM30
2,4,5 - T	<0.1	<0.1	-	-	<0.1	<0.1	-	-	-	<0.1	<0.1	ug/l	TM42/PM30
2,3,6 - TBA	<0.1	<0.1	-	-	<0.1	<0.1	-	-	-	<0.1	<0.1	ug/l	TM42/PM30
Triclopyr	<0.1	<0.1	-	-	<0.1	<0.1	-	-	-	<0.1	<0.1	ug/l	TM42/PM30
TPH CWG													
Aliphatics													
>C5-C6 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM36/PM12
>C6-C8 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM36/PM12
>C8-C10 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM36/PM12
>C10-C12 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	TM5/PM30
>C12-C16 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM5/PM30
>C16-C21 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM5/PM30
>C21-C35 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM5/PM30
Total aliphatics C5-35 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM5/TM36/PM30/PM12
Aromatics													
>C5-EC7 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM36/PM12
>EC8-EC10 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM36/PM12
>EC10-EC12 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	TM5/PM30
>EC12-EC16 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM5/PM30
>EC16-EC21 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM5/PM30
>EC21-EC35 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM5/PM30
Total aromatics C5-35 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM5/TM36/PM30/PM12
Total aliphatics and aromatics(C5-35) #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM5/TM36/PM30/PM12
PCB 28	<0.1	-	-	-	-	<0.1	-	-	-	-	<0.1	ug/l	TM17/PM30
PCB 52	<0.1	-	-	-	-	<0.1	-	-	-	-	<0.1	ug/l	TM17/PM30
PCB 101	<0.1	-	-	-	-	<0.1	-	-	-	-	<0.1	ug/l	TM17/PM30
PCB 118	<0.1	-	-	-	-	<0.1	-	-	-	-	<0.1	ug/l	TM17/PM30
PCB 138	<0.1	-	-	-	-	<0.1	-	-	-	-	<0.1	ug/l	TM17/PM30
PCB 153	<0.1	-	-	-	-	<0.1	-	-	-	-	<0.1	ug/l	TM17/PM30
PCB 180	<0.1	-	-	-	-	<0.1	-	-	-	-	<0.1	ug/l	TM17/PM30
Total 7 PCBs	<0.7	-	-	-	-	<0.7	-	-	-	-	<0.7	ug/l	TM17/PM30
Total Phenols HPLC	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/l	TM26/PM0
Sulphate as SO4 #	60.9	26.9	3.9	87.6	29.8	41.8	64.1	91.4	75.0	257.9	<0.5	mg/l	TM38/PM0
Chloride #	15.2	48.1	21.6	14.7	22.1	48.9	29.1	132.1	22.0	71.0	<0.3	mg/l	TM38/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WM1-Four Ashes
Contact: Emily Betts
JE Job No.: 17/17413

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

J E Sample No.	1-10	11-20	21-29	31-40	41-50	51-60	61-69	70-78	79-87	88-97	LOD/LOR	Units	Method No.
Sample ID	BH230	BH233	BH231	BH118	BH116	BH114	BH226	WS331	BH115	BH229			
Depth													
COC No / misc													
Containers	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G			
Sample Date	19/10/2017	18/10/2017	18/10/2017	18/10/2017	19/10/2017	19/10/2017	19/10/2017	18/10/2017	18/10/2017	18/10/2017			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	20/10/2017	20/10/2017	20/10/2017	20/10/2017	20/10/2017	20/10/2017	20/10/2017	20/10/2017	20/10/2017	20/10/2017			
Nitrate as NO3 #	98.1	<0.2	<0.2	<0.2	20.4	12.7	55.0	6.0	0.3	2.4	<0.2	mg/l	TM38/PM0
Nitrite as NO2 #	<0.02	<0.02	<0.02	0.03	0.18	0.25	<0.02	1.03	0.05	0.06	<0.02	mg/l	TM38/PM0
Ortho Phosphate as PO4 #	<0.06	<0.06	<0.06	<0.06	0.20	<0.06	<0.06	<0.06	0.14	<0.06	<0.06	mg/l	TM38/PM0
Total Cyanide #	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	TM89/PM0
Ammoniacal Nitrogen as N #	0.05	2.80	8.04	0.15	0.03	0.09	<0.03	0.30	3.54	0.05	<0.03	mg/l	TM38/PM0
Hexavalent Chromium	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	ug/l	TM38/PM0
Total Dissolved Chromium III	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	ug/l	NONE/NONE
Sulphide	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	TM106/PM0
pH #	5.84	7.44	7.34	6.85	6.82	6.60	4.42	6.92	6.83	5.48	<0.01	pH units	TM73/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WM1-Four Ashes
Contact: Emily Betts
JE Job No.: 17/17413

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

Please see attached notes for all abbreviations and acronyms

J E Sample No.	98-107	108-116									LOD/LOR	Units	Method No.
Sample ID	BH117	WS330											
Depth													
COC No / misc													
Containers	V H HN N Z P G	V H HN N Z P G											
Sample Date	18/10/2017	19/10/2017											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	20/10/2017	20/10/2017											
Dissolved Arsenic #	<2.5	<2.5									<2.5	ug/l	TM30/PM14
Dissolved Beryllium	<0.5	<0.5									<0.5	ug/l	TM30/PM14
Dissolved Boron	223	132									<12	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5									<0.5	ug/l	TM30/PM14
Total Dissolved Chromium #	1.5	2.0									<1.5	ug/l	TM30/PM14
Dissolved Copper #	43	<7									<7	ug/l	TM30/PM14
Dissolved Lead #	<5	<5									<5	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1									<1	ug/l	TM30/PM14
Dissolved Nickel #	20	<2									<2	ug/l	TM30/PM14
Dissolved Selenium #	<3	<3									<3	ug/l	TM30/PM14
Dissolved Vanadium #	<1.5	3.9									<1.5	ug/l	TM30/PM14
Dissolved Zinc #	5	<3									<3	ug/l	TM30/PM14
Total Hardness Dissolved (as CaCO3)	462	283									<1	mg/l	TM30/PM14
PAH MS													
Naphthalene #	<0.1	0.2									<0.1	ug/l	TM4/PM30
Acenaphthylene #	<0.013	0.110									<0.013	ug/l	TM4/PM30
Acenaphthene #	<0.013	0.071									<0.013	ug/l	TM4/PM30
Fluorene #	<0.014	0.142									<0.014	ug/l	TM4/PM30
Phenanthrene #	<0.011	0.040									<0.011	ug/l	TM4/PM30
Anthracene #	<0.013	0.042									<0.013	ug/l	TM4/PM30
Fluoranthene #	<0.012	0.044									<0.012	ug/l	TM4/PM30
Pyrene #	<0.013	0.018									<0.013	ug/l	TM4/PM30
Benzo(a)anthracene #	<0.015	0.020									<0.015	ug/l	TM4/PM30
Chrysene #	<0.011	0.022									<0.011	ug/l	TM4/PM30
Benzo(bk)fluoranthene #	<0.018	<0.018									<0.018	ug/l	TM4/PM30
Benzo(a)pyrene #	<0.016	<0.016									<0.016	ug/l	TM4/PM30
Indeno(123cd)pyrene #	<0.011	<0.011									<0.011	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	<0.01	<0.01									<0.01	ug/l	TM4/PM30
Benzo(ghi)perylene #	<0.011	<0.011									<0.011	ug/l	TM4/PM30
PAH 16 Total #	<0.195	0.709									<0.195	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.01	<0.01									<0.01	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.01	<0.01									<0.01	ug/l	TM4/PM30
PAH Surrogate % Recovery	73	77									<0	%	TM4/PM30
Methyl Tertiary Butyl Ether #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Benzene #	<0.5	<0.5									<0.5	ug/l	TM15/PM10
Toluene #	<5	<5									<5	ug/l	TM15/PM10
Ethylbenzene #	<1	<1									<1	ug/l	TM15/PM10
p/m-Xylene #	<2	<2									<2	ug/l	TM15/PM10
o-Xylene #	<1	<1									<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	104	101									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	104	100									<0	%	TM15/PM10

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WM1-Four Ashes
Contact: Emily Betts
JE Job No.: 17/17413

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

J E Sample No.	98-107	108-116											
Sample ID	BH117	WS330											
Depth													
COC No / misc													
Containers	V H HN N Z P G	V H HN N Z P G											
Sample Date	18/10/2017	19/10/2017											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	20/10/2017	20/10/2017											

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
Pesticides													
Organochlorine Pesticides													
Aldrin	<0.01	-									<0.01	ug/l	TM149/PM30
Alpha-HCH (BHC)	<0.01	-									<0.01	ug/l	TM149/PM30
Beta-HCH (BHC)	<0.01	-									<0.01	ug/l	TM149/PM30
Delta-HCH (BHC)	<0.01	-									<0.01	ug/l	TM149/PM30
Dieldrin	<0.01	-									<0.01	ug/l	TM149/PM30
Endosulphan I	<0.01	-									<0.01	ug/l	TM149/PM30
Endosulphan II	<0.01	-									<0.01	ug/l	TM149/PM30
Endosulphan sulphate	<0.01	-									<0.01	ug/l	TM149/PM30
Endrin	<0.01	-									<0.01	ug/l	TM149/PM30
Gamma-HCH (BHC)	<0.01	-									<0.01	ug/l	TM149/PM30
Heptachlor	<0.01	-									<0.01	ug/l	TM149/PM30
Heptachlor Epoxide	<0.01	-									<0.01	ug/l	TM149/PM30
o,p'-Methoxychlor	<0.01	-									<0.01	ug/l	TM149/PM30
p,p'-DDE	<0.01	-									<0.01	ug/l	TM149/PM30
p,p'-DDT	<0.01	-									<0.01	ug/l	TM149/PM30
p,p'-Methoxychlor	<0.01	-									<0.01	ug/l	TM149/PM30
p,p'-TDE	<0.01	-									<0.01	ug/l	TM149/PM30
Organophosphorus Pesticides													
Azinphos methyl	<0.01	-									<0.01	ug/l	TM149/PM30
Diazinon	<0.01	-									<0.01	ug/l	TM149/PM30
Dichlorvos	<0.01	-									<0.01	ug/l	TM149/PM30
Disulfoton	<0.01	-									<0.01	ug/l	TM149/PM30
Ethion	<0.01	-									<0.01	ug/l	TM149/PM30
Ethyl Parathion (Parathion)	<0.01	-									<0.01	ug/l	TM149/PM30
Fenitrothion	<0.01	-									<0.01	ug/l	TM149/PM30
Malathion	<0.01	-									<0.01	ug/l	TM149/PM30
Methyl Parathion	<0.01	-									<0.01	ug/l	TM149/PM30
Mevinphos	<0.01	-									<0.01	ug/l	TM149/PM30
Benazolin	<0.1	-									<0.1	ug/l	TM42/PM30
Bentazone	<0.1	-									<0.1	ug/l	TM42/PM30
Bromoxynil	<0.1	-									<0.1	ug/l	TM42/PM30
Clopyralid	<0.1	-									<0.1	ug/l	TM42/PM30
4 - CPA	<0.1	-									<0.1	ug/l	TM42/PM30
2,4 - D	<0.1	-									<0.1	ug/l	TM42/PM30
2,4 - DB	<0.1	-									<0.1	ug/l	TM42/PM30
Dicamba	<0.1	-									<0.1	ug/l	TM42/PM30
Dichloroprop	<0.1	-									<0.1	ug/l	TM42/PM30
Diclofop	<0.1	-									<0.1	ug/l	TM42/PM30
Fenoprop	<0.1	-									<0.1	ug/l	TM42/PM30
Flamprop	<0.1	-									<0.1	ug/l	TM42/PM30
Flamprop – isopropyl	<0.1	-									<0.1	ug/l	TM42/PM30

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WM1-Four Ashes
Contact: Emily Betts
JE Job No.: 17/17413

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

Please see attached notes for all abbreviations and acronyms

J E Sample No.	98-107	108-116									LOD/LOR	Units	Method No.
Sample ID	BH117	WS330											
Depth													
COC No / misc													
Containers	V H HN N Z P G	V H HN N Z P G											
Sample Date	18/10/2017	19/10/2017											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	20/10/2017	20/10/2017											
loxynil	<0.1	-									<0.1	ug/l	TM42/PM30
MCPA	<0.1	-									<0.1	ug/l	TM42/PM30
MCPB	<0.1	-									<0.1	ug/l	TM42/PM30
Mecoprop	<0.1	-									<0.1	ug/l	TM42/PM30
Picloram	<0.1	-									<0.1	ug/l	TM42/PM30
Pentachlorophenol	<0.1	-									<0.1	ug/l	TM42/PM30
2,4,5 - T	<0.1	-									<0.1	ug/l	TM42/PM30
2,3,6 - TBA	<0.1	-									<0.1	ug/l	TM42/PM30
Triclopyr	<0.1	-									<0.1	ug/l	TM42/PM30
TPH CWG													
Aliphatics													
>C5-C6 #	<10	<10									<10	ug/l	TM36/PM12
>C6-C8 #	<10	<10									<10	ug/l	TM36/PM12
>C8-C10 #	<10	<10									<10	ug/l	TM36/PM12
>C10-C12 #	<5	<5									<5	ug/l	TM5/PM30
>C12-C16 #	<10	<10									<10	ug/l	TM5/PM30
>C16-C21 #	<10	<10									<10	ug/l	TM5/PM30
>C21-C35 #	<10	<10									<10	ug/l	TM5/PM30
Total aliphatics C5-35 #	<10	<10									<10	ug/l	TM5/TM36/PM30/PM12
Aromatics													
>C5-EC7 #	<10	<10									<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10									<10	ug/l	TM36/PM12
>EC8-EC10 #	<10	<10									<10	ug/l	TM36/PM12
>EC10-EC12 #	<5	<5									<5	ug/l	TM5/PM30
>EC12-EC16 #	<10	<10									<10	ug/l	TM5/PM30
>EC16-EC21 #	<10	<10									<10	ug/l	TM5/PM30
>EC21-EC35 #	<10	<10									<10	ug/l	TM5/PM30
Total aromatics C5-35 #	<10	<10									<10	ug/l	TM5/TM36/PM30/PM12
Total aliphatics and aromatics(C5-35) #	<10	<10									<10	ug/l	TM5/TM36/PM30/PM12
PCB 28	<0.1	-									<0.1	ug/l	TM17/PM30
PCB 52	<0.1	-									<0.1	ug/l	TM17/PM30
PCB 101	<0.1	-									<0.1	ug/l	TM17/PM30
PCB 118	<0.1	-									<0.1	ug/l	TM17/PM30
PCB 138	<0.1	-									<0.1	ug/l	TM17/PM30
PCB 153	<0.1	-									<0.1	ug/l	TM17/PM30
PCB 180	<0.1	-									<0.1	ug/l	TM17/PM30
Total 7 PCBs	<0.7	-									<0.7	ug/l	TM17/PM30
Total Phenols HPLC	<0.1	<0.1									<0.1	mg/l	TM26/PM0
Sulphate as SO4 #	26.9	<0.5									<0.5	mg/l	TM38/PM0
Chloride #	8.4	18.0									<0.3	mg/l	TM38/PM0

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WM1-Four Ashes
Contact: Emily Betts
JE Job No.: 17/17413

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

J E Sample No.	98-107	108-116									LOD/LOR	Units	Method No.
Sample ID	BH117	WS330											
Depth													
COC No / misc													
Containers	V H HN N Z P G	V H HN N Z P G											
Sample Date	18/10/2017	19/10/2017											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	20/10/2017	20/10/2017											
Nitrate as NO3 #	<0.2	<0.2									<0.2	mg/l	TM38/PM0
Nitrite as NO2 #	0.03	<0.02									<0.02	mg/l	TM38/PM0
Ortho Phosphate as PO4 #	<0.06	<0.06									<0.06	mg/l	TM38/PM0
Total Cyanide #	<0.01	<0.01									<0.01	mg/l	TM89/PM0
Ammoniacal Nitrogen as N #	1.89	3.98									<0.03	mg/l	TM38/PM0
Hexavalent Chromium	<6	<6									<6	ug/l	TM38/PM0
Total Dissolved Chromium III	<6	<6									<6	ug/l	NONE/NONE
Sulphide	<0.01	<0.01									<0.01	mg/l	TM106/PM0
pH #	7.03	6.76									<0.01	pH units	TM73/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WM1-Four Ashes
Contact: Emily Betts
JE Job No.: 17/17413

VOC Report : **Liquid**

J E Sample No.	1-10	11-20	21-29	31-40	41-50	51-60	61-69	70-78	79-87	88-97	LOD/LOR	Units	Method No.
Sample ID	BH230	BH233	BH231	BH118	BH116	BH114	BH226	WS331	BH115	BH229			
Depth													
COC No / misc													
Containers	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G			
Sample Date	19/10/2017	18/10/2017	18/10/2017	18/10/2017	19/10/2017	19/10/2017	19/10/2017	18/10/2017	18/10/2017	18/10/2017			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	20/10/2017	20/10/2017	20/10/2017	20/10/2017	20/10/2017	20/10/2017	20/10/2017	20/10/2017	20/10/2017	20/10/2017			
VOC MS													
Dichlorodifluoromethane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ug/l	TM15/PM10
Chloromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
Chloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
Bromochloromethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Chloroform #	<2	<2	<2	<2	11	28	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Dibromomethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2	<2	<2	4	10	<2	<2	<2	<2	<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Toluene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Dibromochloromethane #	<2	<2	<2	<2	<2	3	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
p/m-Xylene #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
o-Xylene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
Styrene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Bromoform #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Isopropylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/l	TM15/PM10
Bromobenzene #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Propylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Naphthalene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	95	101	101	95	95	97	104	106	103	101	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	100	102	100	100	104	102	100	102	102	101	<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WM1-Four Ashes
Contact: Emily Betts
JE Job No.: 17/17413

VOC Report : **Liquid**

J E Sample No.	98-107	108-116									LOD/LOR	Units	Method No.
Sample ID	BH117	WS330											
Depth													
COC No / misc													
Containers	V H HN N Z P G	V H HN N Z P G											
Sample Date	18/10/2017	19/10/2017											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	20/10/2017	20/10/2017											
VOC MS													
Dichlorodifluoromethane	<2	<2									<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Chloromethane #	<3	<3									<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1									<1	ug/l	TM15/PM10
Chloroethane #	<3	<3									<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3									<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3									<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<5	<5									<5	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3									<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3	<3									<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3									<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1									<1	ug/l	TM15/PM10
Bromochloromethane #	<2	<2									<2	ug/l	TM15/PM10
Chloroform #	<2	<2									<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2									<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3									<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2									<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2									<2	ug/l	TM15/PM10
Benzene #	<0.5	<0.5									<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2									<2	ug/l	TM15/PM10
Dibromomethane #	<3	<3									<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2									<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2									<2	ug/l	TM15/PM10
Toluene #	<5	<5									<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2									<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2									<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3									<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2									<2	ug/l	TM15/PM10
Dibromochloromethane #	<2	<2									<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2									<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2									<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2	<2									<2	ug/l	TM15/PM10
Ethylbenzene #	<1	<1									<1	ug/l	TM15/PM10
p/m-Xylene #	<2	<2									<2	ug/l	TM15/PM10
o-Xylene #	<1	<1									<1	ug/l	TM15/PM10
Styrene	<2	<2									<2	ug/l	TM15/PM10
Bromoform #	<2	<2									<2	ug/l	TM15/PM10
Isopropylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4									<4	ug/l	TM15/PM10
Bromobenzene #	<2	<2									<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3									<3	ug/l	TM15/PM10
Propylbenzene #	<3	<3									<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3									<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3									<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3									<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3	<3									<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3									<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2									<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3									<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3									<3	ug/l	TM15/PM10
Naphthalene	<2	<2									<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3									<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	104	101									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	104	100									<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Ramboll Environ UK Ltd

Reference: UK1522306

Location: WM1-Four Ashes

Contact: Emily Betts

Matrix : Liquid

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 17/17413

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 17/17413

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	TM005: Modified USEPA 8015B. Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID. TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID. Including determination of BTEX and calculation of Aliphatic fractions	PM30/PM12	CWG GC-FID	Yes			
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM17	Modified US EPA method 8270. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.				
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.				
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.	Yes			

JE Job No: 17/17413

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM0	No preparation is required.				
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM0	No preparation is required.	Yes			
TM42	Modified US EPA method 8270. Pesticides and herbicdes by GC-MS	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.	Yes			
TM106	Determination of Sulphide by Skalar Continuous Flow Analyser	PM0	No preparation is required.				
TM149	Determination of Pesticides by Large Volume Injection on GC Triple Quad MS, based upon USEPA method 8270	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
NONE	No Method Code	NONE	No Method Code				

Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

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Ramboll Environ UK Ltd
Corner Block
2 Cornwall Street
Birmingham
B3 2DX

Attention :	Emily Betts
Date :	14th November, 2017
Your reference :	UK1522306
Our reference :	Test Report 17/18135 Batch 1
Location :	WMI Four Ashes
Date samples received :	2nd November, 2017
Status :	Final report
Issue :	1

Twelve samples were received for analysis on 2nd November, 2017 of which twelve were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

[redacted]

Paul Boden BSc
Project Manager

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Emily Betts
JE Job No.: 17/18135

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, HN=$HN0_3$

J E Sample No.	1-10	11-19	20-29	30-38	39-47	48-57	58-66	67-76	77-86	87-96	LOD/LOR	Units	Method No.
Sample ID	BH117	WS331	BH233	BH118	WS330	BH229	BH115	BH230	BH226	BH114			
Depth													
COC No / misc													
Containers	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G			
Sample Date	31/10/2017	31/10/2017	31/10/2017	31/10/2017	31/10/2017	31/10/2017	31/10/2017	01/11/2017	01/11/2017	01/11/2017			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017			
Dissolved Arsenic #	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	ug/l	TM30/PM14
Dissolved Beryllium	<0.5	<0.5	<0.5	<0.5	<0.5	1.0	<0.5	<0.5	11.8	<0.5	<0.5	ug/l	TM30/PM14
Dissolved Boron	210	171	346	204	135	78	435	106	84	46	<12	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5	<0.5	<0.5	<0.5	1.1	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM30/PM14
Total Dissolved Chromium #	<1.5	<1.5	<1.5	<1.5	2.6	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	ug/l	TM30/PM14
Dissolved Copper #	33	<7	<7	8	<7	<7	12	<7	<7	<7	<7	ug/l	TM30/PM14
Dissolved Lead #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM30/PM14
Dissolved Nickel #	14	<2	<2	6	3	28	4	12	23	2	<2	ug/l	TM30/PM14
Dissolved Selenium #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM30/PM14
Dissolved Vanadium #	<1.5	2.5	<1.5	1.5	4.3	<1.5	1.7	<1.5	<1.5	<1.5	<1.5	ug/l	TM30/PM14
Dissolved Zinc #	<3	<3	6	<3	4	78	12	130	10	<3	<3	ug/l	TM30/PM14
Total Hardness Dissolved (as CaCO3)	467	242	324	438	281	308	317	158	104	69	<1	mg/l	TM30/PM14
PAH MS													
Naphthalene #	<0.1	0.6	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ug/l	TM4/PM30
Acenaphthylene #	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	0.013	<0.013	<0.013	<0.013	<0.013	ug/l	TM4/PM30
Acenaphthene #	<0.013	0.290	0.044	<0.013	0.092	0.040	0.013	<0.013	<0.013	<0.013	<0.013	ug/l	TM4/PM30
Fluorene #	<0.014	0.142	0.022	<0.014	0.067	0.028	<0.014	<0.014	<0.014	<0.014	<0.014	ug/l	TM4/PM30
Phenanthrene #	<0.011	0.294	0.061	<0.011	0.158	0.033	0.012	<0.011	<0.011	<0.011	<0.011	ug/l	TM4/PM30
Anthracene #	0.020	0.082	0.029	<0.013	0.050	<0.013	0.018	<0.013	<0.013	0.020	<0.013	ug/l	TM4/PM30
Fluoranthene #	0.041	0.117	0.071	<0.012	0.029	<0.012	0.026	<0.012	<0.012	0.036	<0.012	ug/l	TM4/PM30
Pyrene #	0.045	0.097	0.069	<0.013	0.036	<0.013	0.021	<0.013	<0.013	0.037	<0.013	ug/l	TM4/PM30
Benzo(a)anthracene #	0.063	0.068	0.060	<0.015	0.016	<0.015	<0.015	<0.015	<0.015	0.050	<0.015	ug/l	TM4/PM30
Chrysene #	0.085	0.087	0.083	<0.011	0.016	<0.011	<0.011	<0.011	<0.011	0.067	<0.011	ug/l	TM4/PM30
Benzo(bk)fluoranthene #	0.133	0.114	0.125	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	0.102	<0.018	ug/l	TM4/PM30
Benzo(a)pyrene #	0.037	0.034	0.034	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	0.033	<0.016	ug/l	TM4/PM30
Indeno(123cd)pyrene #	0.064	0.050	0.059	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.051	<0.011	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	0.08	0.06	0.07	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.06	<0.01	ug/l	TM4/PM30
Benzo(ghi)perylene #	0.070	0.053	0.065	<0.011	<0.011	<0.011	<0.011	<0.011	<0.011	0.056	<0.011	ug/l	TM4/PM30
PAH 16 Total #	0.638	2.088	0.792	<0.195	0.464	<0.195	<0.195	<0.195	<0.195	0.512	<0.195	ug/l	TM4/PM30
Benzo(b)fluoranthene	0.10	0.08	0.09	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.07	<0.01	ug/l	TM4/PM30
Benzo(k)fluoranthene	0.04	0.03	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	ug/l	TM4/PM30
PAH Surrogate % Recovery	79	76	76	71	71	70	74	70	71	76	<0	%	TM4/PM30
Methyl Tertiary Butyl Ether #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM15/PM10
Toluene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
p/m-Xylene #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
o-Xylene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	118	114	111	116	114	116	114	115	117	118	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	108	104	103	106	104	106	105	104	106	108	<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Emily Betts
JE Job No.: 17/18135

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-10	11-19	20-29	30-38	39-47	48-57	58-66	67-76	77-86	87-96	LOD/LOR	Units	Method No.
Sample ID	BH117	WS331	BH233	BH118	WS330	BH229	BH115	BH230	BH226	BH114			
Depth													
COC No / misc													
Containers	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G			
Sample Date	31/10/2017	31/10/2017	31/10/2017	31/10/2017	31/10/2017	31/10/2017	31/10/2017	01/11/2017	01/11/2017	01/11/2017			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017			
Pesticides													
Organochlorine Pesticides													
Aldrin	<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	<0.01	ug/l	TM149/PM30
Alpha-HCH (BHC)	<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	<0.01	ug/l	TM149/PM30
Beta-HCH (BHC)	<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	<0.01	ug/l	TM149/PM30
Delta-HCH (BHC)	<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	<0.01	ug/l	TM149/PM30
Dieldrin	<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	<0.01	ug/l	TM149/PM30
Endosulphan I	<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	<0.01	ug/l	TM149/PM30
Endosulphan II	<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	<0.01	ug/l	TM149/PM30
Endosulphan sulphate	<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	<0.01	ug/l	TM149/PM30
Endrin	<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	<0.01	ug/l	TM149/PM30
Gamma-HCH (BHC)	<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	<0.01	ug/l	TM149/PM30
Heptachlor	<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	<0.01	ug/l	TM149/PM30
Heptachlor Epoxide	<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	<0.01	ug/l	TM149/PM30
o,p'-Methoxychlor	<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	<0.01	ug/l	TM149/PM30
p,p'-DDE	<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	<0.01	ug/l	TM149/PM30
p,p'-DDT	<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	<0.01	ug/l	TM149/PM30
p,p'-Methoxychlor	<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	<0.01	ug/l	TM149/PM30
p,p'-TDE	<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	<0.01	ug/l	TM149/PM30
Organophosphorus Pesticides													
Azinphos methyl	<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	<0.01	ug/l	TM149/PM30
Diazinon	<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	<0.01	ug/l	TM149/PM30
Dichlorvos	<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	<0.01	ug/l	TM149/PM30
Disulfoton	<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	<0.01	ug/l	TM149/PM30
Ethion	<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	<0.01	ug/l	TM149/PM30
Ethyl Parathion (Parathion)	<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	<0.01	ug/l	TM149/PM30
Fenitrothion	<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	<0.01	ug/l	TM149/PM30
Malathion	<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	<0.01	ug/l	TM149/PM30
Methyl Parathion	<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	<0.01	ug/l	TM149/PM30
Mevinphos	<0.01	-	<0.01	-	-	<0.01	-	<0.01	-	<0.01	<0.01	ug/l	TM149/PM30
Benazolin	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-	<0.1	<0.1	ug/l	TM42/PM30
Bentazone	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-	<0.1	<0.1	ug/l	TM42/PM30
Bromoxynil	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-	<0.1	<0.1	ug/l	TM42/PM30
Clopyralid	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-	<0.1	<0.1	ug/l	TM42/PM30
4 - CPA	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-	<0.1	<0.1	ug/l	TM42/PM30
2,4 - D	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-	<0.1	<0.1	ug/l	TM42/PM30
2,4 - DB	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-	<0.1	<0.1	ug/l	TM42/PM30
Dicamba	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-	<0.1	<0.1	ug/l	TM42/PM30
Dichloroprop	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-	<0.1	<0.1	ug/l	TM42/PM30
Diclofop	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-	<0.1	<0.1	ug/l	TM42/PM30
Fenoprop	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-	<0.1	<0.1	ug/l	TM42/PM30
Flamprop	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-	<0.1	<0.1	ug/l	TM42/PM30
Flamprop – isopropyl	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-	<0.1	<0.1	ug/l	TM42/PM30

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Sample Date	31/10/2017	31/10/2017	31/10/2017	31/10/2017	31/10/2017	31/10/2017	31/10/2017	01/11/2017	01/11/2017	01/11/2017			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017			
loxynil	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-	<0.1	<0.1	ug/l	TM42/PM30
MCPA	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-	<0.1	<0.1	ug/l	TM42/PM30
MCPB	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-	<0.1	<0.1	ug/l	TM42/PM30
Mecoprop	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-	<0.1	<0.1	ug/l	TM42/PM30
Picloram	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-	<0.1	<0.1	ug/l	TM42/PM30
Pentachlorophenol	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-	<0.1	<0.1	ug/l	TM42/PM30
2,4,5 - T	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-	<0.1	<0.1	ug/l	TM42/PM30
2,3,6 - TBA	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-	<0.1	<0.1	ug/l	TM42/PM30
Triclopyr	<0.1	-	<0.1	-	-	<0.1	-	<0.1	-	<0.1	<0.1	ug/l	TM42/PM30
TPH CWG													
Aliphatics													
>C5-C6 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM36/PM12
>C6-C8 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM36/PM12
>C8-C10 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM36/PM12
>C10-C12 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	TM5/PM30
>C12-C16 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM5/PM30
>C16-C21 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM5/PM30
>C21-C35 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM5/PM30
Total aliphatics C5-35 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM5/TM36/PM30/PM12
Aromatics													
>C5-EC7 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM36/PM12
>EC8-EC10 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM36/PM12
>EC10-EC12 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	TM5/PM30
>EC12-EC16 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM5/PM30
>EC16-EC21 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM5/PM30
>EC21-EC35 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM5/PM30
Total aromatics C5-35 #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM5/TM36/PM30/PM12
Total aliphatics and aromatics(C5-35) #	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ug/l	TM5/TM36/PM30/PM12
PCB 28	<0.1	-	-	-	-	-	-	<0.1	-	<0.1	<0.1	ug/l	TM17/PM30
PCB 52	<0.1	-	-	-	-	-	-	<0.1	-	<0.1	<0.1	ug/l	TM17/PM30
PCB 101	<0.1	-	-	-	-	-	-	<0.1	-	<0.1	<0.1	ug/l	TM17/PM30
PCB 118	<0.1	-	-	-	-	-	-	<0.1	-	<0.1	<0.1	ug/l	TM17/PM30
PCB 138	<0.1	-	-	-	-	-	-	<0.1	-	<0.1	<0.1	ug/l	TM17/PM30
PCB 153	<0.1	-	-	-	-	-	-	<0.1	-	<0.1	<0.1	ug/l	TM17/PM30
PCB 180	<0.1	-	-	-	-	-	-	<0.1	-	<0.1	<0.1	ug/l	TM17/PM30
Total 7 PCBs	<0.7	-	-	-	-	-	-	<0.7	-	<0.7	<0.7	ug/l	TM17/PM30
Total Phenols HPLC	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/l	TM26/PM0
Sulphate as SO4 #	27.5	123.1	23.2	89.8	<0.5	236.9	88.7	80.1	67.9	41.6	<0.5	mg/l	TM38/PM0
Chloride #	8.8	180.1	53.4	13.4	21.3	71.7	21.1	14.6	27.0	46.5	<0.3	mg/l	TM38/PM0

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Emily Betts
JE Job No.: 17/18135

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

J E Sample No.	1-10	11-19	20-29	30-38	39-47	48-57	58-66	67-76	77-86	87-96	LOD/LOR	Units	Method No.
Sample ID	BH117	WS331	BH233	BH118	WS330	BH229	BH115	BH230	BH226	BH114			
Depth													
COC No / misc													
Containers	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G			
Sample Date	31/10/2017	31/10/2017	31/10/2017	31/10/2017	31/10/2017	31/10/2017	31/10/2017	01/11/2017	01/11/2017	01/11/2017			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017			
Nitrate as NO3 #	<0.2	5.5	<0.2	<0.2	<0.2	2.4	<0.2	91.8	51.2	12.8	<0.2	mg/l	TM38/PM0
Nitrite as NO2 #	<0.02	0.37	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.78	<0.02	mg/l	TM38/PM0
Ortho Phosphate as PO4 #	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.27	<0.06	<0.06	0.14	<0.06	mg/l	TM38/PM0
Total Cyanide #	<0.01	0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	TM89/PM0
Ammoniacal Nitrogen as N #	1.41	0.36	2.68	0.16	0.71	0.05	3.98	<0.03	0.09	0.04	<0.03	mg/l	TM38/PM0
Hexavalent Chromium	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	ug/l	TM38/PM0
Total Dissolved Chromium III	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	ug/l	NONE/NONE
Sulphide	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	TM106/PM0
pH #	6.96	6.97	7.52	6.99	6.79	5.42	6.87	6.00	4.58	7.40	<0.01	pH units	TM73/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Emily Betts
JE Job No.: 17/18135

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

Please see attached notes for all abbreviations and acronyms

J E Sample No.	97-106	107-115									LOD/LOR	Units	Method No.
Sample ID	BH116	BH231											
Depth													
COC No / misc													
Containers	V H HN N Z P G	V H HN N Z P G											
Sample Date	01/11/2017	31/10/2017											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	02/11/2017	02/11/2017											
Dissolved Arsenic #	<2.5	<2.5									<2.5	ug/l	TM30/PM14
Dissolved Beryllium	<0.5	<0.5									<0.5	ug/l	TM30/PM14
Dissolved Boron	43	610									<12	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5									<0.5	ug/l	TM30/PM14
Total Dissolved Chromium #	<1.5	<1.5									<1.5	ug/l	TM30/PM14
Dissolved Copper #	<7	<7									<7	ug/l	TM30/PM14
Dissolved Lead #	<5	<5									<5	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1									<1	ug/l	TM30/PM14
Dissolved Nickel #	8	<2									<2	ug/l	TM30/PM14
Dissolved Selenium #	<3	<3									<3	ug/l	TM30/PM14
Dissolved Vanadium #	<1.5	2.2									<1.5	ug/l	TM30/PM14
Dissolved Zinc #	4	3									<3	ug/l	TM30/PM14
Total Hardness Dissolved (as CaCO3)	42	509									<1	mg/l	TM30/PM14
PAH MS													
Naphthalene #	<0.1	<0.1									<0.1	ug/l	TM4/PM30
Acenaphthylene #	<0.013	<0.013									<0.013	ug/l	TM4/PM30
Acenaphthene #	<0.013	0.090									<0.013	ug/l	TM4/PM30
Fluorene #	<0.014	0.022									<0.014	ug/l	TM4/PM30
Phenanthrene #	<0.011	0.093									<0.011	ug/l	TM4/PM30
Anthracene #	0.022	0.043									<0.013	ug/l	TM4/PM30
Fluoranthene #	0.041	0.071									<0.012	ug/l	TM4/PM30
Pyrene #	0.038	0.075									<0.013	ug/l	TM4/PM30
Benzo(a)anthracene #	0.060	0.065									<0.015	ug/l	TM4/PM30
Chrysene #	0.084	0.087									<0.011	ug/l	TM4/PM30
Benzo(bk)fluoranthene #	0.137	0.130									<0.018	ug/l	TM4/PM30
Benzo(a)pyrene #	0.039	0.033									<0.016	ug/l	TM4/PM30
Indeno(123cd)pyrene #	0.061	0.059									<0.011	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	0.07	0.07									<0.01	ug/l	TM4/PM30
Benzo(ghi)perylene #	0.068	0.065									<0.011	ug/l	TM4/PM30
PAH 16 Total #	0.620	0.903									<0.195	ug/l	TM4/PM30
Benzo(b)fluoranthene	0.10	0.09									<0.01	ug/l	TM4/PM30
Benzo(k)fluoranthene	0.04	0.04									<0.01	ug/l	TM4/PM30
PAH Surrogate % Recovery	76	74									<0	%	TM4/PM30
Methyl Tertiary Butyl Ether #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Benzene #	<0.5	<0.5									<0.5	ug/l	TM15/PM10
Toluene #	<5	<5									<5	ug/l	TM15/PM10
Ethylbenzene #	<1	<1									<1	ug/l	TM15/PM10
p/m-Xylene #	<2	<2									<2	ug/l	TM15/PM10
o-Xylene #	<1	<1									<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	117	117									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	107	107									<0	%	TM15/PM10

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Emily Betts
JE Job No.: 17/18135

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

Please see attached notes for all abbreviations and acronyms

J E Sample No.	97-106	107-115									LOD/LOR	Units	Method No.
Sample ID	BH116	BH231											
Depth													
COC No / misc													
Containers	V H HN N Z P G	V H HN N Z P G											
Sample Date	01/11/2017	31/10/2017											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	02/11/2017	02/11/2017											
Pesticides													
Organochlorine Pesticides													
Aldrin	<0.01	-									<0.01	ug/l	TM149/PM30
Alpha-HCH (BHC)	<0.01	-									<0.01	ug/l	TM149/PM30
Beta-HCH (BHC)	<0.01	-									<0.01	ug/l	TM149/PM30
Delta-HCH (BHC)	<0.01	-									<0.01	ug/l	TM149/PM30
Dieldrin	<0.01	-									<0.01	ug/l	TM149/PM30
Endosulphan I	<0.01	-									<0.01	ug/l	TM149/PM30
Endosulphan II	<0.01	-									<0.01	ug/l	TM149/PM30
Endosulphan sulphate	<0.01	-									<0.01	ug/l	TM149/PM30
Endrin	<0.01	-									<0.01	ug/l	TM149/PM30
Gamma-HCH (BHC)	<0.01	-									<0.01	ug/l	TM149/PM30
Heptachlor	<0.01	-									<0.01	ug/l	TM149/PM30
Heptachlor Epoxide	<0.01	-									<0.01	ug/l	TM149/PM30
o,p'-Methoxychlor	<0.01	-									<0.01	ug/l	TM149/PM30
p,p'-DDE	<0.01	-									<0.01	ug/l	TM149/PM30
p,p'-DDT	<0.01	-									<0.01	ug/l	TM149/PM30
p,p'-Methoxychlor	<0.01	-									<0.01	ug/l	TM149/PM30
p,p'-TDE	<0.01	-									<0.01	ug/l	TM149/PM30
Organophosphorus Pesticides													
Azinphos methyl	<0.01	-									<0.01	ug/l	TM149/PM30
Diazinon	<0.01	-									<0.01	ug/l	TM149/PM30
Dichlorvos	<0.01	-									<0.01	ug/l	TM149/PM30
Disulfoton	<0.01	-									<0.01	ug/l	TM149/PM30
Ethion	<0.01	-									<0.01	ug/l	TM149/PM30
Ethyl Parathion (Parathion)	<0.01	-									<0.01	ug/l	TM149/PM30
Fenitrothion	<0.01	-									<0.01	ug/l	TM149/PM30
Malathion	<0.01	-									<0.01	ug/l	TM149/PM30
Methyl Parathion	<0.01	-									<0.01	ug/l	TM149/PM30
Mevinphos	<0.01	-									<0.01	ug/l	TM149/PM30
Benazolin	<0.1	-									<0.1	ug/l	TM42/PM30
Bentazone	<0.1	-									<0.1	ug/l	TM42/PM30
Bromoxynil	<0.1	-									<0.1	ug/l	TM42/PM30
Clopyralid	<0.1	-									<0.1	ug/l	TM42/PM30
4 - CPA	<0.1	-									<0.1	ug/l	TM42/PM30
2,4 - D	<0.1	-									<0.1	ug/l	TM42/PM30
2,4 - DB	<0.1	-									<0.1	ug/l	TM42/PM30
Dicamba	<0.1	-									<0.1	ug/l	TM42/PM30
Dichloroprop	<0.1	-									<0.1	ug/l	TM42/PM30
Diclofop	<0.1	-									<0.1	ug/l	TM42/PM30
Fenoprop	<0.1	-									<0.1	ug/l	TM42/PM30
Flamprop	<0.1	-									<0.1	ug/l	TM42/PM30
Flamprop – isopropyl	<0.1	-									<0.1	ug/l	TM42/PM30

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Emily Betts
JE Job No.: 17/18135

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

Please see attached notes for all abbreviations and acronyms

J E Sample No.	97-106	107-115									LOD/LOR	Units	Method No.
Sample ID	BH116	BH231											
Depth													
COC No / misc													
Containers	V H HN N Z P G	V H HN N Z P G											
Sample Date	01/11/2017	31/10/2017											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	02/11/2017	02/11/2017											
loxynil	<0.1	-									<0.1	ug/l	TM42/PM30
MCPA	<0.1	-									<0.1	ug/l	TM42/PM30
MCPB	<0.1	-									<0.1	ug/l	TM42/PM30
Mecoprop	<0.1	-									<0.1	ug/l	TM42/PM30
Picloram	<0.1	-									<0.1	ug/l	TM42/PM30
Pentachlorophenol	<0.1	-									<0.1	ug/l	TM42/PM30
2,4,5 - T	<0.1	-									<0.1	ug/l	TM42/PM30
2,3,6 - TBA	<0.1	-									<0.1	ug/l	TM42/PM30
Triclopyr	<0.1	-									<0.1	ug/l	TM42/PM30
TPH CWG													
Aliphatics													
>C5-C6 #	<10	<10									<10	ug/l	TM36/PM12
>C6-C8 #	<10	<10									<10	ug/l	TM36/PM12
>C8-C10 #	<10	<10									<10	ug/l	TM36/PM12
>C10-C12 #	<5	<5									<5	ug/l	TM5/PM30
>C12-C16 #	<10	<10									<10	ug/l	TM5/PM30
>C16-C21 #	<10	<10									<10	ug/l	TM5/PM30
>C21-C35 #	<10	<10									<10	ug/l	TM5/PM30
Total aliphatics C5-35 #	<10	<10									<10	ug/l	TM5/TM36/PM30/PM12
Aromatics													
>C5-EC7 #	<10	<10									<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10									<10	ug/l	TM36/PM12
>EC8-EC10 #	<10	<10									<10	ug/l	TM36/PM12
>EC10-EC12 #	<5	<5									<5	ug/l	TM5/PM30
>EC12-EC16 #	<10	<10									<10	ug/l	TM5/PM30
>EC16-EC21 #	<10	<10									<10	ug/l	TM5/PM30
>EC21-EC35 #	<10	<10									<10	ug/l	TM5/PM30
Total aromatics C5-35 #	<10	<10									<10	ug/l	TM5/TM36/PM30/PM12
Total aliphatics and aromatics(C5-35) #	<10	<10									<10	ug/l	TM5/TM36/PM30/PM12
PCB 28	-	-									<0.1	ug/l	TM17/PM30
PCB 52	-	-									<0.1	ug/l	TM17/PM30
PCB 101	-	-									<0.1	ug/l	TM17/PM30
PCB 118	-	-									<0.1	ug/l	TM17/PM30
PCB 138	-	-									<0.1	ug/l	TM17/PM30
PCB 153	-	-									<0.1	ug/l	TM17/PM30
PCB 180	-	-									<0.1	ug/l	TM17/PM30
Total 7 PCBs	-	-									<0.7	ug/l	TM17/PM30
Total Phenols HPLC	<0.1	<0.1									<0.1	mg/l	TM26/PM0
Sulphate as SO4 #	28.0	2.4									<0.5	mg/l	TM38/PM0
Chloride #	1.5	22.0									<0.3	mg/l	TM38/PM0

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Emily Betts
JE Job No.: 17/18135

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

J E Sample No.	97-106	107-115											
Sample ID	BH116	BH231											
Depth													
COC No / misc													
Containers	V H HN N Z P G	V H HN N Z P G											
Sample Date	01/11/2017	31/10/2017											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	02/11/2017	02/11/2017											

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
Nitrate as NO3 #	14.6	<0.2									<0.2	mg/l	TM38/PM0
Nitrite as NO2 #	<0.02	<0.02									<0.02	mg/l	TM38/PM0
Ortho Phosphate as PO4 #	0.12	<0.06									<0.06	mg/l	TM38/PM0
Total Cyanide #	<0.01	<0.01									<0.01	mg/l	TM89/PM0
Ammoniacal Nitrogen as N #	<0.03	8.22									<0.03	mg/l	TM38/PM0
Hexavalent Chromium	<6	<6									<6	ug/l	TM38/PM0
Total Dissolved Chromium III	<6	<6									<6	ug/l	NONE/NONE
Sulphide	<0.01	<0.01									<0.01	mg/l	TM106/PM0
pH #	5.56	7.36									<0.01	pH units	TM73/PM0

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Emily Betts
JE Job No.: 17/18135

VOC Report : **Liquid**

J E Sample No.	1-10	11-19	20-29	30-38	39-47	48-57	58-66	67-76	77-86	87-96	LOD/LOR	Units	Method No.
Sample ID	BH117	WS331	BH233	BH118	WS330	BH229	BH115	BH230	BH226	BH114			
Depth													
COC No / misc													
Containers	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G	V H HN N Z P G			
Sample Date	31/10/2017	31/10/2017	31/10/2017	31/10/2017	31/10/2017	31/10/2017	31/10/2017	01/11/2017	01/11/2017	01/11/2017			
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017			
VOC MS													
Dichlorodifluoromethane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ug/l	TM15/PM10
Chloromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
Chloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
Bromochloromethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Chloroform #	<2	<2	<2	<2	<2	<2	<2	<2	<2	28	<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Benzene #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Dibromomethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	10	<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Toluene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Dibromochloromethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	3	<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Ethylbenzene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
p/m-Xylene #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
o-Xylene #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	ug/l	TM15/PM10
Styrene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Bromoform #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
Isopropylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	ug/l	TM15/PM10
Bromobenzene #	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Propylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Naphthalene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	118	114	111	116	114	116	114	115	117	118	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	108	104	103	106	104	106	105	104	106	108	<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Emily Betts
JE Job No.: 17/18135

VOC Report : **Liquid**

J E Sample No.	97-106	107-115											
Sample ID	BH116	BH231											
Depth													
COC No / misc													
Containers	V H HN N Z P G	V H HN N Z P G											
Sample Date	01/11/2017	31/10/2017											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	02/11/2017	02/11/2017											

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
VOC MS													
Dichlorodifluoromethane	<2	<2									<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Chloromethane #	<3	<3									<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1									<1	ug/l	TM15/PM10
Chloroethane #	<3	<3									<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3									<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3									<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<5	<5									<5	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3									<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3	<3									<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3									<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1									<1	ug/l	TM15/PM10
Bromochloromethane #	<2	<2									<2	ug/l	TM15/PM10
Chloroform #	<2	<2									<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2									<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3									<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2									<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2									<2	ug/l	TM15/PM10
Benzene #	<0.5	<0.5									<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2									<2	ug/l	TM15/PM10
Dibromomethane #	<3	<3									<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2									<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2									<2	ug/l	TM15/PM10
Toluene #	<5	<5									<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2									<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2									<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3									<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2									<2	ug/l	TM15/PM10
Dibromochloromethane #	<2	<2									<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2									<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2									<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2	<2									<2	ug/l	TM15/PM10
Ethylbenzene #	<1	<1									<1	ug/l	TM15/PM10
p/m-Xylene #	<2	<2									<2	ug/l	TM15/PM10
o-Xylene #	<1	<1									<1	ug/l	TM15/PM10
Styrene	<2	<2									<2	ug/l	TM15/PM10
Bromoform #	<2	<2									<2	ug/l	TM15/PM10
Isopropylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4									<4	ug/l	TM15/PM10
Bromobenzene #	<2	<2									<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3									<3	ug/l	TM15/PM10
Propylbenzene #	<3	<3									<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3									<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3									<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3									<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3	<3									<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3									<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2									<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3									<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3									<3	ug/l	TM15/PM10
Naphthalene	<2	<2									<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3									<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	117	117									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	107	107									<0	%	TM15/PM10

Client Name: Ramboll Environ UK Ltd
Reference: UK1522306
Location: WMI Four Ashes
Contact: Emily Betts

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 17/18135						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 17/18135

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 17/18135

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	TM005: Modified USEPA 8015B. Determination of solvent Extractable Petroleum Hydrocarbons (EPH) including column fractionation in the carbon range of C10-35 into aliphatic and aromatic fractions by GC-FID. TM036: Modified USEPA 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C5-10 by headspace GC-FID. Including determination of BTEX and calculation of Aliphatic fractions	PM30/PM12	CWG GC-FID	Yes			
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM17	Modified US EPA method 8270. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.				
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.				
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.	Yes			

JE Job No: 17/18135

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM0	No preparation is required.				
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM0	No preparation is required.	Yes			
TM42	Modified US EPA method 8270. Pesticides and herbicdes by GC-MS	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.	Yes			
TM106	Determination of Sulphide by Skalar Continuous Flow Analyser	PM0	No preparation is required.				
TM149	Determination of Pesticides by Large Volume Injection on GC Triple Quad MS, based upon USEPA method 8270	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
NONE	No Method Code	NONE	No Method Code				

APPENDIX 5
A – GAS MONITORING DATA
B – GROUNDWATER LEVEL DATA
C – WATER QUALITY DATA

Appendix 5A - Gas Monitoring Field Data			
Project:	UK15-22306	**Site:**	Four Ashes, Staffordshire
Monitored by:	Alice Kilner and Emily Betts	**Dates:**	(1) 18-19/10/2017; (2) 26/10/17 and (3) 31/10/17-01/11/17. (4) 01/12/17 (5) 21/12/17 (6) 03/01/18
Equipment:	Geotech Interface Dip Meter, Casella PID MiniRae 3000, GA5000 Gas Analyser.	**Weather:**	(1) Overcast with heavy rain showers (2) Overcast, cool and dry (3) Overcast, cool (4) Cold, frosty (5) Overcast, cool (6) Overcast, windy
Atmospheric Pressure:	(1) Falling pressure (1016 hPa to 996 hPa, across two days) (2) Rising pressure (1023 hPa to 1027 hPa) (3) Falling pressure (1027 hPa to 1016 hPa, across two days) (4) Rising pressure (1029 hPa to 1035 hPa) (5) Falling pressure (1035 hPa to 1033 hPa) (6) Falling pressure (1030 hPa to 1024 hPa)		

BH	Date	Flow	Methane (% v/v)	Carbon Dioxide (% v/v)	Oxygen (% v/v)	Carbon Monoxide (ppm)	Hydrogen Disulphide (ppm)	PID (ppm)	Pressure (h Pa)	dP (mb)	dtw (m bgl)	dtb (m bgl)
WS325	19/10/17	<0.1	<0.1	6.3	15.8	<1	<1	0.8	0.00	985	DRY	4.05
	26/10/17	0.1	<0.1	2.0	19.0	<1	1	0.1	0.05	1009	DRY	
	01/11/17	<0.1	<0.1	3.2	18.6	<1	<1	0.2	0.00	1005	DRY	
	01/12/17	<0.1	<0.1	1.7	21.0	<1	<1	<1	-0.07	1010	DRY	

Appendix 5B: Groundwater Level Monitoring Results			
Project	UK15-22306	**Site**	Four Ashes, Staffordshire
Monitored By:	Emily Betts and Alice Kilner	**Date**	October, November and December 2017 and January 2018
Equipment	Geotech Interface Dip Meter	**Weather**	Generally cold <10°C with occasional rain events during all monitoring sessions.

	18-19/10/17		**26/10/2017**		**31/10/17-01/11/17**		**01/12/2017**		**06/12/2017**		**21/12/2017**	
BH	**m bgl**	**m AOD**	**m bgl**	**m AOD**	**m bgl**	**m AOD**	**m bgl**	**m AOD**	**m bgl**	**m AOD**	**m bgl**	**m AOD**
BH114	6.15	102.15	6.24	102.06	6.17	102.13	6.27	102.03	6.21	102.09	6.2	102.1
BH115	4.47	102.53	3.55	103.45	4.51	102.49	4.7	102.3	4.62	102.38	4.64	102.36
BH116	3.79	102.91	4.3	102.4	4.07	102.63	4.34	102.36	4.25	102.45	4.18	102.52
BH117	2.52	101.68	2.8	101.4	2.5	101.7	2.55	101.65	2.58	101.62	2.22	101.98
BH118	3.04	102.46	3.03	102.47	3.07	102.43	3.17	102.33	3	102.5	2.8	102.7
BH226	4.15	103.05	4.25	102.95	4.22	102.98	4.37	102.83	4.28	102.92	4.33	102.87
BH229	4.5	102.3	4.92	101.88	4.59	102.21	4.74	102.06	4.63	102.17	4.68	102.12
BH230	5.7	101.7	5.79	101.61	5.77	101.63	5.82	101.58	5.75	101.65	5.7	101.7
BH231	5.41	101.59	5.34	101.66	5.34	101.66	5.4	101.6	5.31	101.69	5.28	101.72
BH233	2.48	101.62	2.48	101.62	2.46	101.64	2.41	101.69	2.4	101.7	2.09	102.01

bgl : below ground level AOD : above ordnance datum

Appendix 5C – Stabilised Groundwater Physiochemical Parameters			
Project	UK15-22306	**Site**	Four Ashes, Staffordshire
Monitored By:	Emily Betts and Alice Kilner	**Date**	18-19/10/2017 and 31/10/17-01/11/17
Equipment	Geotech Interface Dip Meter, SmarTroll Water Quality Meter	**Weather**	Overcast with heavy rain showers with low temperatures of approx. 12°C across the first event and overcast, cool and dry approx. 10°C across the second event.

BH	Date	Temp (°C)	DO (%)	DO (mg/l)	SPC (µS/cm)	pH	ORP (mV)	dtw (m bgl)	dtb (m bgl)
BH114	19/10/17	11.24	74.27	7.97	433.13	6.69	96.69	6.15	8.90
	01/11/17	11.52	61.67	6.67	409.59	6.43	81.0	6.17	8.97
BH115	18/10/17	11.41	36.87	4.15	1034.9	6.92	74.80	4.47	9.19
	31/10/17	11.57	30.73	3.33	1186.1	6.90	40.90	4.51	9.22
BH116	19/10/17	11.43	61.39	6.55	303.27	6.12	117.2	3.79	9.36
	01/11/17	11.71	49.72	5.36	120.16	5.07	151.8	4.07	9.40
BH117	19/10/17	12.08	19.61	2.08	942.46	6.99	-35.7	2.52	6.70
	31/10/17	12.51	21.64	2.30	968.20	6.84	-30.3	2.50	8.79
BH118	18/10/17	12.41	18.88	1.98	968.05	6.81	68.2	3.04	8.96
	31/10/17	12.26	23.38	2.51	989.04	6.65	32.8	3.07	8.84
BH226	19/10/17	12.21	76.15	8.00	338.49	4.29	236.8	4.15	7.23
	01/11/17	12.17	73.08	7.88	340.48	4.28	195.9	4.22	7.30
BH229	18/10/17	11.76	25.54	2.73	25.54	5.59	165.6	4.50	8.16
	31/10/17	11.61	43.41	4.70	811.09	5.23	170.7	4.59	8.18
BH230	19/10/17	11.65	83.75	8.87	433.13	6.69	96.9	5.70	9.03
	01/11/17	12.07	84.11	8.98	404.04	5.43	115.2	5.77	9.21
BH231	18/10/17	11.23	14.65	1.58	794.54	7.17	-103.0	5.41	8.93
	31/10/17	11.66	15.60	1.68	1248.7	7.22	-81.4	5.34	8.87

BH	Date	Temp (°C)	DO (%)	DO (mg/l)	SPC (µS/cm)	pH	ORP (mV)	dtw (m bgl)	dtb (m bgl)
BH233	18/10/17	12.08	58.84	6.24	982.65	7.36	-47.9	2.48	7.47
	31/10/17	12.30	78.45	8.37	1020.3	7.36	-30.8	2.46	7.45
WS330	19/10/17	13.07	2.51	0.26	1109.5	6.32	-70.9	3.16	4.01
	31/10/17	11.43	14.46	1.57	1235.7	6.66	-76.0	3.28	4.00
WS331	19/10/17	12.43	6.74	0.82	1042.8	7.18	-23.6	2.23	3.49
	31/10/17	12.71	49.39	5.22	1208.0	6.78	-3.0	2.26	3.47

Notes:

dtw = depth to groundwater level

dtb = depth to base of the monitoring well

Appendix 5A - Gas Monitoring Field Data

BH	Date	Flow	Methane (% v/v)	Carbon Dioxide (% v/v)	Oxygen (% v/v)	Carbon Monoxide (ppm)	Hydrogen Disulphide (ppm)	PID (ppm)	Pressure (h Pa)	dP (mb)	dtw (m bgl)	dtb (m bgl)
WS326	19/10/17	<0.1	<0.1	2.6	19.1	<1	<1	0.2	0.00	989	1.90	3.90
	26/10/17	0.1	<0.1	2.6	18.7	<1	<1	0.1	0.00	1009	1.85	
	01/11/17	<0.1	<0.1	2.5	18.8	<1	1	0.1	0.00	1004	1.87	
	01/12/17	<0.1	<0.1	2.1	20.3	<1	<1	<0.1	-0.02	1010	1.66	
WS330	19/10/17	0.1	18.3	12.8	<0.1	<1	<1	1.1	0.33	986	3.16	4.01
	26/10/17	<0.1	<0.1	1.2	18.4	<1	1	<0.1	-0.10	1010	3.30	
	31/10/17	0.1	7.1	10.4	0.8	1	<1	0.5	0.02	1010	3.28	
	01/12/17	0.1	<0.1	5.8	8.1	<1	<1	<0.1	-0.59	1011	3.43	
WS327	19/12/17	0.1	9.1	9.5	<0.0	<1	<1	1.9	0.19	986	3.20	4.10
	26/10/17	<0.1	3.6	4.9	8.8	1	1	0.7	-0.10	1011	3.29	
	31/10/17	<0.1	7.1	9.4	<0.0	1	<1	0.8	-0.07	1010	3.69	
	01/12/17	<0.1	7.0	8.4	1.0	<1	<1	0.6	0.05	1011	3.79	
WS331	18/10/17	<0.1	<0.1	6.1	15.0	<1	<1	<0.1	0.05	997	2.23	3.49
	26/10/17	<0.1	<0.1	5.8	14.8	<1	<1	0.1	-0.12	1010	2.47	
	31/10/17	<0.1	<0.1	5.8	14.8	<1	<1	0.1	0.07	1010	2.26	
	01/12/17	<0.1	<0.1	5.8	14.0	<1	<1	<0.1	0.07	1010	2.34	
WS332	18/10/17	<0.1	12.0	6.1	0.1	<1	<1	0.4	0.05	999	3.49	4.09
	26/10/17	<0.1	2.0	2.8	14.8	1	1	0.3	0.10	1011	3.56	
	31/10/17	<0.1	10.7	6.2	<0.1	1	<1	0.4	-0.07	1010	3.56	
	01/12/17	<0.1	0.2	0.9	20.0	<1	<1	<0.1	-0.03	1010	3.47	
WS333	18/10/17	0.1	<0.1	5.4	4.5	2	1	0.5	0.00	998	2.63	3.81
	26/10/17	<0.1	<0.1	1.1	20.0	1	1	0.1	-0.03	1010	2.63	
	31/10/17	<0.1	<0.1	5.1	2.5	1	1	0.3	-0.02	1008	2.65	
	06/12/17	0.1	<0.1	4.8	2.7	<1	<1	<0.1	0.02	1010	DRY	

Appendix 5A - Gas Monitoring Field Data

BH	Date	Flow	Methane (% v/v)	Carbon Dioxide (% v/v)	Oxygen (% v/v)	Carbon Monoxide (ppm)	Hydrogen Disulphide (ppm)	PID (ppm)	Pressure (h Pa)	dP (mb)	dtw (m bgl)	dtb (m bgl)
BH234	19/12/17	<0.1	<0.1	3.0	19.1	<1	<1	0.2	0.02	988	3.56	3.98
	26/10/17	0.1	<0.1	2.8	18.9	<1	<1	0.1	0.07	1011	3.68	
	01/11/17	0.1	<0.1	2.9	18.8	<1	1	0.1	0.00	1003	3.65	
	01/12/17	0.1	0.0	2.5	19.3	<1	<1	<0.1	0.00	1011	3.72	
WS328	01/12/17	<0.1	<0.1	1.7	20.7	<1	<1	<0.1	-0.07	1010	DRY	3.22
	06/12/17	0.1	<0.1	2.2	19.1	<1	<1	<0.1	0.09	1010	DRY	
	21/12/17	0.0	<0.1	5.3	14.3	<1	<1	<0.1	-0.03	1021	DRY	
	03/01/18	<0.1	<0.1	5.3	13.8	<1	<1	<0.1	0.05	980	DRY	