Rail Central, Milton Malsor

Northamptonshire

Main Strategic Rail Freight Interchange

Ground Investigation Report

Final Report for

ASHFIELD LAND

May 2017, updated February 2018

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SITE INFORMATION AND SETTING	
Report Purpose	Preliminary Ground Investigation Report to allow a preliminary geo-environmental and geotechnical assessment of the entire site for Environmental Impact Assessment.
Client	Ashfield Land.
Site Name and Location	Rail Central, Main Strategic Rail Freight Interchange (SFRI) Site Milton Malsor, Northamptonshire. The National Grid Reference for the approximate centre of the site is 473080, 254830.
Proposed Development	Strategic Rail Freight Interchange (SRFI) including warehousing, an intermodal facility, express freight platform, lorry park and associated infrastructure.
Current Land Use and Description	The site is approximately 260 ha in area and consists predominantly of agricultural land bound by the A43 to the west, the West Coast Main Line to the south and the Northampton Loop Railway Line to the east. There are two farms, a derelict filling station, two former sand pits, a horticultural nursery and a private dwelling present on site. One of the sand pits located in the northwest corner of the site was historically landfilled under an inert Waste Management Licence. There are a number of services on site including a high pressure aviation fuel pipeline operated by BPA in the southwest of the site.
Site History	The site has essentially been in agricultural use since prior to the earliest available mapping. Previous development is limited to historical quarrying and landfill in the northwest of the site and the development of the present day land uses (farms, a redundant filling station and residential dwellings). In addition, there are earthworks present in: • the northwest of the site (Rathvilly Farm), where ground levels are raised; • the southwest of the site in the form of embankments for the Grand Union Canal and former Great Central Railway; and • in the southeast of the site, understood to be arisings deposited following excavation of Roade Cutting which is located to the southeast of the site along the West Coast Main Line.
Geology	The stratigraphic sequence at the site as indicated by BGS mapping is: • Alluvium; • Oadby Member (Glacial Till); • Glaciofluvial Deposits; • Wellingborough Limestone Member; • Rutland Formation; • Stamford Member; • Northampton Sand Formation; • Whitby Mudstone Formation; • Marlstone Rock Formation; and • Dyrham Formation. Made Ground may be present associated with areas of former or current development and landfilling.
Mining or Mineral Extraction	The Glaciofluvial Deposits in this area are locally known as the Milton Sands and appear to have been worked in the north, northwest and northeast of the site. The sand pits in the north and northwest were subsequently landfilled (with “inert” fill). The sand pit in the northwest of the site (Rathvilly Farm) is an unrecorded landfill and anecdotal information suggests that it was subsequently infilled with arisings from the construction of the M1 motorway. The northern part of the site is designated as a Mineral Safeguarding Area (MSA) under the Northamptonshire Minerals and Waste Local Plan (MWLP) (adopted May 2017). The safeguarding area relates to Glaciofluvial sand known locally as Milton Sand. Hydrock do not believe the proposed SRFI development will result in the sterilisation of exploitable mineral resources of economic importance.

	The northeastern corner of the site is within the 300m buffer of an allocated sand and gravel extraction site (M1: Milton Malsor), which relates to a 1.2 million tonne resource at Maple Farm. However, Hydrock do not believe the proposed SRFI development presents a risk to the future viability of M1: Milton Malsor.
Hydrogeology	The recorded aquifer status of the soils below the site: • Alluvium (Secondary Undifferentiated Aquifer). • Oadby Member (Unproductive Strata). • Glaciofluvial Deposits (Secondary A Aquifer). • Wellingborough Limestone Member (Secondary A Aquifer); • Rutland Formation (Secondary Undifferentiated Aquifer); • Stamford Member (Secondary Undifferentiated Aquifer); • Northampton Sand Formation ((Secondary A Aquifer); • Whitby Formation (Unproductive Strata). • Marlstone Rock Formation (Secondary A Aquifer). • Dyrham Formation (Secondary Undifferentiated Aquifer). The site is not is a Source Protection Zone and there are no licensed groundwater abstractions within 2km of the site.
Hydrology	The site is drained by the Milton Malsor Brook, including and eastern tributary arm, which flow from south to north across the area. In addition there are a number of small ponds and springs which are channelled to the brooks via open ditches.
Radon	Basic radon protective measures are required according to current guidance.
PHASE 2 – GROUND INVESTIGATION	
Hydrock Site Works	The initial Hydrock ground investigation undertaken between 22nd August 2016 and 6th June, 2017 on accessible sections of the site comprised: • 49 cable percussive boreholes to a maximum depth of 15.55m below ground level (bgl); • 18 window sample boreholes to a maximum depth of 5.45m bgl; • 145 trial pits to a maximum depth of 3.40m bgl; • 4 hand dug pits to a maximum depth of 0.20m bgl; • 11 infiltration tests; • chemical testing of soils, waters and leachates and geotechnical testing of soils and rocks; • 40 installations of gas and groundwater monitoring standpipes; and • monitoring of gas and groundwater on 8 occasions. Additional Hydrock investigations were undertaken on previously inaccessible areas in the southeast and northeast of the site between 20th February and 6th June 2017 and comprised in total: • 10 window sample boreholes to a maximum depth of 5.45m bgl; • Installation of ground gas and groundwater monitoring standpipes; • 19 trial pits to a maximum depth of 3.40m bgl; and • chemical testing of soils, and geotechnical testing of soils and rocks. A number of the exploratory holes were located to target potential contamination sources identified in the desk study, including the landfill, former filling station, farms and an unrecorded landfill in the northeast of the site.
Ground Conditions Encountered (All Data)	The ground investigation has confirmed ground conditions below the site to comprise: • Topsoil over the majority of the site consisting predominantly of clay and sandy clay; • Variable Made Ground comprising: ○ Landfill Made Ground in the northwest of the site extending to a proven depth of 7.50m (and possibly deeper based on topographic levels) and consisting of variable gravelly clay and gravelly sand, with cobbles and boulders and locally organic material.

	○ Made Ground derived from arisings from Roade Cutting in the southeast of the site consisting of clay with cobbles and boulders of limestone and proven to be greater than 3.00m thick in places. ○ Made Ground at Rathvilly Farm pit consisting of sandy gravelly clay, clayey sandy gravel and fine gravel of ash, and with cobbles, boulders and asbestos containing material, extending to a depth of up to 4.50m thickness. ○ Made Ground consisting of imported aggregates and reworked natural clay at the former filling station, proven to be up to 1.70m in thickness. ○ Made Ground consisting of variable clay, sand and gravel present to a depth of up to 1.30m at Lodge Farm. The Made Ground at Lodge Farm includes ash and clinker and cobble size particles of demolition type material. ○ Made Ground consisting of sandy gravelly clay with cobbles placed to form the embankment of the Grand Union Canal, proven to up to 1.70m thickness. ○ Other discrete areas of Made Ground associated with agriculture proven to be up to 1.25m thick and consisting of variable sand, gravel and clay with man-made inclusions. • Variable superficial deposits comprising: ○ Alluvium located through the centre of the site around the Milton Malsor Brook and consisting of clay and sandy clay. Locally there is a basal bed of sand and gravel present across the low lying ground in the south of the site. The Alluvium is typically 2.50m thick in the south of the site. In the north of the site, the Alluvium includes deposits of clay, silt, organic clay and sand and has been proven to a maximum thickness of 3.00m. ○ Glaciofluvial Deposits are present in the north of the site and consist of sand and gravelly sand with a variable fines content and occasional beds of sandy clay. The Glaciofluvial Deposits are greater than 10m thick in the north of the site. ○ Glacial Till is present along the eastern edge of the site and in the northwest corner. The Glacial Till consists of slightly sandy slightly gravelly and gravelly clay with gravel of flint, limestone, chalk and mudstone. The Till has been proven to a maximum depth of 3.20m in the vicinity of Lodge Farm. • Wellingborough Limestone is present at surface in the extreme southeast corner of the site and consists of clayey sandy gravel. • Rutland Formation is present in the southeast corner of the site and consists of stiff sandy clay interbedded with sand. • Stamford Member is present in the southeast of the site and consists of clayey sandy gravel of residual sandstone fragments and sandy clay. • Northampton Sand which is present in the southeast corner of the site and consists of gravelly sand with thin beds of clay. • Whitby Mudstone is present under the majority of the site and consists of stiff fissured clay with mudstone lithorelicts and fragments, along with fossils and frequent crystals of gypsum. • The Marlstone Rock Formation is present underlying the Whitby Mudstone and outcrops approximately as anticipated by the Desk Study. The Marlstone Rock consists of limestone with ironstone gravel and fossils, and is places is weathered to sand and gravel. A maximum thickness of 2.00m thickness was encountered. However, it is typically less than 1.00m in thickness. • The Dyrham Formation is present underlying the Marlstone and outcrops in the northwest of the site. The Dyrham Formation consists of stiff clay, sandy clay with relict rock fragments and gypsum crystals.
Groundwater Encountered (All Data)	Groundwater is present underlying the site, with a general northward flow direction and is present within all the geological units on site depending on their elevation. However, within the Whitby Mudstone groundwater is generally found towards the base and may in places be confined within the underlying Marlstone. Locally, in some areas of Made Ground and in the Glacial Till in the east, a perched water table is present within the superficial deposits. The groundwater is in continuity with the Milton Malsor Brook.

GEO-ENVIRONMENTAL ASSESSMENT AND CONCLUSIONS	
Conclusions of Contamination Generic Risk Assessment (All Data) **(Including Guidance on Gas Protection Measures)**	**Human health:** • Hotspot of benzo(a)pyrene at Lodge Farm associated with Made Ground; • Hotspot of petroleum hydrocarbons at Lodge Farm associated with Made Ground; • Asbestos containing material in the Made Ground at Lodge Farm. • Asbestos containing material in Rathvilly Farm pit; • Petroleum hydrocarbons in Rathvilly Farm pit; • Hotspot of petroleum hydrocarbons in the southwest of the site adjacent to the Grand Union Canal; and • Potential for petroleum hydrocarbons associated with the former filling station on the A43. **Plant growth:** • pervasive boron in natural subsoil, Roade Cutting and Rathvilly Farm pit Made Ground, but assessed as low risk; • hot spots of boron and copper in Made Ground present at the farms. **Controlled Waters:** • Whilst there are a number of substances exceeding the DWS and/or EQS in groundwater samples. These substances are believed to be either: o naturally occurring; o present as a result of agricultural activity; or o are only slightly elevated. As there is no evidence of contamination of the adjacent surface waters, Hydrock consider that the site does not pose an unacceptable risk to Controlled Waters. **Ground gases or vapours:** • The section of the site proposed for development has been provisionally classed as Characteristic Situation 1 pending completion of monitoring. • A high concentration of methane has been measured in Rathvilly Farm pit. However, this is in an area of proposed landscaping and a significant distance from proposed buildings. **Radon:** • The site is in a Radon Affected Area and consideration of basic radon protection measures should be made in line with current guidance. **Water supply pipes:** • The majority of the site is greenfield and the investigation and assessment has indicated no exceedance of the threshold values. It is envisaged that standard pipework will be suitable for the majority of the site. • In the landfill and Lodge Farm areas, a number of the threshold values for PAH species and petroleum hydrocarbons are exceeded. In these areas, it is anticipated that barrier pipework will be required. • Guidance from Anglian Water indicates that for large sites such as this it may be possible for the site to be classified as 'dual status', i.e. contaminated and non-contaminated, from the perspective of the water supply pipe requirements.
Proposed Mitigation Measures	Further investigation and risk assessment is necessary to determine the full extent of remediation measures necessary. However, based on the findings of the works to date, the scope of remediation is likely to consist of the following: • Removal by specialist contractors of asbestos from buildings in accordance with relevant legislation; • Controlled decommissioning, decontamination and demolition of site buildings and ancillary structures such as tanks and the existing drainage system. • Removal of the former fuel tanks at Lodge Farm and the Filling Station together with any petroleum hydrocarbon impacted soils around and below the tanks. Whilst not expected, any free phase hydrocarbons should be removed from the surface of the groundwater and treated or disposed. • It is anticipated that remediation can then be undertaken by excavating the impacted Made Ground soils (where required) which can then be stockpiled, screened or otherwise treated on site (e.g. bioremediation).

	• Suitable material can be reused where appropriate under a Materials Management Plan and the unsuitable material removed from site. Given the volume of earthworks, it is anticipated that all materials are likely to be suitable for use on the site, as unsuitable material from the perspective of human health is likely to be suitable for reuse in the platforms in areas external to the proposed buildings, e.g. in noise bunds. • At this stage, with regards to the Rathvilly Farm pit, no specific remediation is anticipated as this area will form part of the landscape buffer zone. • If Made ground is to remain in-situ at surface (e.g. former landfills in the north and northeast and the Rathvilly Farm pit), Hydrock would propose that as a minimum 450mm of topsoil / subsoil growing medium is placed over these sections of the site. • Earthworks and remediation on site should be subject to a watching brief by an independent geo-environmental specialist to identify any areas of suspected contamination and recommend remedial measures. • It is recommended that consideration be given to incorporating basic radon protection measures. • Installation of barrier pipework as necessary and agreed with the Water Authority.
GEOTECHNICAL CONCLUSIONS	
Obstructions	No impenetrable man made obstructions were encountered during the investigation. Boulders (>200mm) are present in the Made Ground (landfill, Roade Cutting and Rathvilly Farm pit). In addition, obstructions are anticipated as a legacy of buildings and infrastructure. It is envisaged that standard plant will be sufficient to remove obstructions.
Groundworks	Excavation within the superficial deposits and shallow, residual clay soils is likely to be readily undertaken with conventional plant and equipment. Within the Whitby Mudstone, Dyrham Formation, and in particular the Marlstone Rock, excavation is likely to require hydraulic breaker attachments or ripping shanks to enable plant to penetrate hard strata. The majority of excavations within clay strata were stable over the short period of time for which they were open. Excavation within the Made Ground (landfill), Alluvium and, in particular, the Glaciofluvial Deposits, were frequently found to be unstable. Temporary trench support, or battering of excavation sides, is likely to be required for all excavations that are to be left open for any length of time, and will definitely be required where man entry is required. Particular attention should be paid to excavation at, or close to, site boundaries/adjoining existing roads/structures/buildings, where collapse of excavation faces could have a disproportionate effect. A risk assessment of the stability of any open excavation should be undertaken by a competent person and appropriate measures adopted to ensure safe working practise in and around open excavations. Long term groundwater levels vary between very shallow (0.05m) and relatively deep (10.23m). Shallow groundwater is generally associated with the Alluvium and the Whitby Mudstone in the lower ground in the south and southwest of the site. Significant water flow was observed in limestone bands in the Whitby Mudstone and in the Marlstone Rock bed. For excavations within the Whitby Mudstone, it may be found that the rate of groundwater ingress is sufficiently slow to control groundwater by sump pumping of excavations. However, it is cautioned that rapid groundwater ingress is likely to occur upon encountering limestone bands within the Whitby Mudstone or the Marlstone Rock. In the Alluvium and Marlstone Rock, significant groundwater ingress was encountered in places and alternative methods of dewatering including cut-offs, or well points, may prove necessary. However, it should be recognised that groundwater levels will fluctuate seasonally and the timing of construction may dictate the extent of groundwater control required.
Earthworks	With reference to the Specification for Highway Works, the preliminary assessment undertaken in this investigation indicates soils may be suitable for reuse in the following material classes for General Fill based on grading: • Topsoil – Class 4 Landscape Fill and / or Class 5 Topsoil; • Made Ground (landfill) – combination of Class 1 and Class 2, subject to removal of over-sized material and processing; • Made Ground (Roade Cutting) – Class 2A/B and 2C subject to removal of over-size material;

	• Alluvium – predominantly Class 2 based on grading, in places Class 1, subject to removal of any unsuitable organic material; • Glaciofluvial Deposits – predominantly Class 1; • Whitby Mudstone – predominantly Class 2A/B, in places Class 2C; • Marlstone Rock Formation – Class 2C based on a single test. However, it is anticipated that the excavated Marlstone Rock Formation is likely to consist of a mixture of granular and cohesive material, and contain a large proportion of over-sized rock fragments; and • Dyrham Formation – mixture of Class 2A/B and Class 2C. Testing has shown that, with the exception of some of the Glaciofluvial sand, the majority of soils are wet of the optimum moisture content for recompaction. Control of the earthworks will have to take into consideration the range of maximum dry densities and optimum moisture contents achieved in the testing. Based on the sulphate and total sulphur concentrations measured the use of hydraulic binders to modify or stabilise soils is considered to be unsuitable at this site.
Ground Settlement	Topsoil should be removed before placement of fill. In addition, where present below a proposed development platform, Made Ground should be removed prior to placement of fill. For landscape areas and noise bunds the Made Ground can likely remain in situ, subject to detailed design. If significant loads are to be placed on the Made Ground, for example noise bunds, ground improvement may be required. Where constructed on Glaciofluvial Deposits, Glacial Till or the underlying solid geology, as long as the formation is correctly prepared (subject to design) no significant settlement of earthworks is anticipated. Proposals include the construction of embankments over infilled watercourses and will need to be appropriately designed. Embankments of up to around 5m height within these areas will be constructed over the existing areas of Alluvium which will undergo settlement due to consolidation. Based on the laboratory oedometric modulus, settlement in the order of 65 to 100mm could be induced in the Alluvium in the south of the site if it were to remain in situ without any treatment. It may therefore be necessary to remove and re-engineer or replace Alluvium where the consolidation settlement is assessed to be a potential issue.
Foundations	Based on the current earthworks model, the topography of the site and available information on the proposed layout, all of the proposed buildings will span areas of both cut and fill. Geotechnical Design Reports will be required for foundation designs. An allowable net bearing pressure of 120kN/m^2 to 150kN/m^2 should be available for the design of nominally sized pad foundations founded within the Glacial Till, Whitby Mudstone Formation, Marlstone Rock and Dyrham Formation. In the north of the site buildings may span contrasting deposits of Glaciofluvial sand and Whitby Mudstone. It is anticipated that the Glaciofluvial Deposits will be capable of supporting nominally sized pads with an allowable net bearing pressure of 120kN/m^2 to 150kN/m^2. Where foundations are to be supported by engineered fill, the end performance will be determined by the earthworks specification, supervision and control. It could be reasonably assumed that an allowable bearing pressure in the order of 120kN/m^2 could be achieved within the engineered fill materials available without excessive settlement. However, this will require detailed design. For particularly heavy structures or where a very tight tolerance to settlement is required, it may be necessary to consider piled foundations. The design of foundations should be subject of separate Geotechnical Design Reports.
Ground Floor Slabs	Following further detailed investigations, design recommendations for ground floor slabs will need to be presented in a Geotechnical Design Report for the site. It could be reasonably anticipated that soils of the Whitby Mudstone should be capable of supporting a ground floor slab with a nominal uniformly Distributed Load (UDL) of 50kN/m^2. Subject to undertaking earthworks to an appropriate specification, a modulus of subgrade reaction (k) of 35MN/m^2/m could be assumed for the preliminary design of ground floor slabs supported on earthworks. If higher loads are required, this may be able to be increased during the design process by the use of increased stone layer thicknesses and geogrids.
Road Pavement Design (CBR)	With reference to the document HA IAN 73/06, a long term equilibrium CBR of 2.5% should be adopted for preliminary design.
Soakaways	The clay soils on site are unsuitable for soakaway drainage which discounts this option for disposal of surface water over the great majority of the site. It may be possible to use soakaway drainage in the

	north of the site where Glaciofluvial Deposits are present. Should it be desirable to explore the option further, it is recommended that additional testing is undertaken to confirm the infiltration rate for design.
Buried Concrete	Design Sulphate Class DS-4 and ACEC Class AC-4.
FUTURE CONSIDERATIONS	
Uncertainties and Limitations	The current scope of works provides an overview of conditions at the site. It is anticipated further specific investigations will be necessary for detailed design. Investigation has been limited in some areas of the site, for example Lodge Farm, because of the continued occupation and use of the buildings. Further investigation and risk assessment has been recommended for this area of the site. It may not be possible to fully assess conditions at this area prior to demolition of the existing buildings. At present, there is one land parcel within the proposed development that had not been investigated pending negotiation of access rights. There is insufficient gas monitoring to fully characterise the site in accordance with CIRIA Report C665. Monitoring is on-going and the conclusions of this report will be updated following completion of the scheduled monitoring.
Further Work	The following further works will be required to finalise this report: • completion and reporting of the scheduled gas and groundwater monitoring. • discussions with regulatory bodies regarding the conclusions of this report; Following the above works and as part of future design works, further works will include: • further design investigations, including areas of the site where access has currently been restricted; • pre-demolition surveys including asbestos; • discussions with service providers regarding the materials suitable for pipework etc.; • discussions with regulatory bodies regarding the conclusions of further reports; • preparation of Geotechnical Design Reports (GDR) for platforms, areas of key infrastructure and Category 2 structures; • detailed design; • preparation of a Remediation Method Statement; • remediation in specific areas of site; • cut to fill earthworks; • site watching brief during earthworks and remediation; and • verification of the works.

This Executive Summary forms part of Hydrock Consultants Limited report number R/151171/002 (Issue 4) and should not be used as a separate document.

1.0 INTRODUCTION

1.1 Terms of Reference

In August 2016, Hydrock Consultants Limited (Hydrock) was commissioned by Ashfield Land (the Client) to undertake a ground investigation in relation to the proposed Rail Central development at Milton Malsor, Northamptonshire.

The site covers approximately 260 ha and is currently farmland.

The proposed development is to comprise a Strategic Rail Freight Interchange (SRFI) including warehousing, an intermodal facility, express freight platform, lorry park and associated infrastructure. It should be noted that as part of the development it is proposed to undertake highway improvements of Junction 15A of the M1, along with various smaller road junctions. This report excludes these areas.

A site location plan (Drawing 151171/D001), and a Site Extents Plan (151171/D002) are presented in Appendix A.

1.2 Objectives

The objectives of this investigation are to assess the ground and groundwater conditions to provide initial geotechnical design recommendations and to carry out a risk assessment of potential chemical contaminants to establish 'suitability for use' under the current planning regime and support an Environmental Impact Assessment.

1.3 Scope

The scope of work for this commission comprises:

- a summary of the Desk Study Information presented in the previous Hydrock report (reference R/151171/001 Issue 008);
- a preliminary ground investigation including trial pitting, window sampling, cable percussive boring, gas and groundwater monitoring, laboratory chemical and geotechnical testing; and
- reporting on findings of the ground investigation, geo-environmental assessment of the site conditions and geotechnical interpretation of the ground and groundwater conditions.

The extent of the Ground Investigation study area is the land within the proposed development area and the immediate surrounding area. The immediate area is defined for the purposes of this chapter as land within close proximity to or bordering the relevant part of the site (i.e. less than 250m from the site) and has the potential to be a contaminant source which may affect the site or be affected by the site. It should be understood that site investigation works are limited to the proposed SRFI site where access is allowed.

See Appendix E for detailed reporting methodology.

The investigation reported herein provides an overview of the geotechnical and geo-environmental conditions at the development site. Design recommendations are not provided for specific development plots.

1.4 Provided Information

The following has been provided to Hydrock by the Client for use in the preparation of this report:

- Milton Keynes Surveys drawing, 'Northampton Highgate, Topographic Survey', reference 12605, dated January 2008.

1.5 Approach

The work has been carried out in general accordance with recognised best practice as detailed in guidance documents such as the CLR 11 M*odel Procedures* (Environment Agency 2004), the AGS (2006) *Good Practice Guidelines for Site Investigations*, BS 5930:2015 and BS10175:2011+A1:2013. The technical details of the approach and the methodologies adopted are given in Appendix E.

A recognised phased approach has been followed, starting with a Phase 1 which comprises a desk study and walk-over to produce a preliminary assessment of the site conditions and the important factors that require further investigation to reduce uncertainty. Phase 1 was reported in Hydrock report R/151171/001, Issue 008, dated 07th February 2017.

Phase 2 (this report) comprises intrusive investigation work and testing. The factual data from Phases 1 and 2 are used to develop a conceptual site model (CSM) which comprises a ground model of the physical conditions and an exposure model of the possible contaminant linkages. The CSM forms the basis for a number of risk assessments in accordance with current guidelines. Professional judgement is then used to evaluate the findings of the risk assessments and to provide recommendations for the project.

By convention, the geo-environmental and the geotechnical aspects are discussed in separate sections, but in instances where interaction is required to produce a holistic design, this is discussed at the end of the geotechnical recommendations section.

Remaining uncertainties and recommendations for further work are listed at the end of the report.

2.0 DESK STUDY REVIEW

A Phase 1 Desk Study has been undertaken previously for the site and is reported in Hydrock Report reference R/151171/001, Issue 008, dated 07th February 2017, herein referred to as the Desk Study Report. The following section provides a summary of the main findings of the desk study to inform the subsequent sections. The reader should refer to the Desk Study Report for full coverage.

2.1 Site Referencing

The site is referenced in Table 2.1.

Table 2.1: Site Referencing Information

Item	Brief Description
Site name	Rail Central.
Site location and grid reference	The Main SRFI site covers an area of approximately 260 ha immediately south of the village of Milton Malsor and approximately 450m north of the village of Blisworth in Northamptonshire. The site extends from the A43 in the west to the Northampton Loop Railway Line in the east. The National Grid Reference for the approximate centre of the site is 473080, 254830. A relevant post code for the site is NN7 3DW.

A Site Location Plan (Hydrock drawing 151171/D001) is provided in Appendix A.

2.2 Site Description

For clarity and given the size of the proposed development, the Desk Study Report considered the site in three areas, denoted as Areas A, B and C.

Area A covered land at Arm Farm to the west of the A43.

Area B covered land between the A43 in the west, and Northampton Road and Towcester Road in the east. This area of the site includes a redundant filling station on the A43 and a former landfill site in the north.

Area C covered land to the east of Northampton Road and Towcester Road, and to the west of the Northampton Loop Railway Line, incorporating Lodge and Manor Farms and the Diocese of Peterborough Land.

A site description as described in the Desk Study Report, is presented in Table 2.2.

Table 2.2: Site Description

Item	Brief Description
Site area	Approximately 260 ha.
Transport network	Area A and Area B are separated on an approximately north to south line by the A43 dual carriageway. Area B and Area C are bisected on an approximate north to south line by Northampton Road/Towcester Road (single carriage road). Gayton Road forms the northern site boundary of Area B. Barn Lane (unadopted track) bisects the northern part of Area C. Rectory Lane forms part of the northern site boundary of Area C. The Grand Union Canal forms part of the southwest boundary of Area B.
Surface Drainage	There is a brook in Area B (Milton Malsor Brook) which flows from the south to the north. An eastern tributary of the Milton Malsor Brook rises in the north of Area C and flows north, joining the main Milton Malsor Brook further to the north. For the purpose of the report this has been referred to as the Milton Malsor Brook Eastern Arm.
Present land use and vegetation	**Area A** This comprises an area of land between the Grand Union Canal and the A43. It is principally occupied by single storey residential dwellings with associated gardens, in the west, with two fields to the east. Collectively, the area is known as 'Arm Farm'. At the time of the walkover, the southern field was occupied by sheep and the northern field was empty. Field boundaries are defined by mature tree and hedge growth and domestic gardens. Gayton Marina is located on the western side of the canal. **Area B** Area B comprises twenty fields and a wooded area adjacent to the A43. At the time of the walkover, the fields were cropped, except for two fields in the south, which were grassland. Boundaries are defined by mature tree and hedge growth with gaps and/or gates to be used for access. There are no farm buildings in this area. There is an above ground storage tank (no bund) adjacent to the northeast site boundary (north of the proposed Unit 10). The tank apparently carries water for an adjacent pheasant enclosure. To the east of this, is a steep sided pit, but dense vegetation made viewing the pit difficult. There is hummocky ground adjacent to a field boundary near the north of the area (associated with a former farm building beneath proposed Unit 12). There is ridge and furrow in the southwest field of the area as well as two distinct raised earthworks: one orientated east to west associated with the Grand Union Canal and another orientated north to south associated with a former railway line (now dismantled and with the bridge over the canal now removed). A derelict filling station was located adjacent to the A43 in the central west site boundary. Access from the A43 was restricted by an approximately 1m high earth bund. A transport yard was present in the northwest field, but it was not possible to enter this area (no permission was available). A field in the southwest of the site had been partially stripped of topsoil and was very soft and damp. It is understood this relates to an ongoing leak of water from the Grand Union Canal. **Area C** Area C comprises nineteen fields, Lodge Farm, Manor Farm and Barn Lane. At the time of the walkover the fields were cropped or grassland. Boundaries were defined by mature tree and hedge growth with gaps and/or access gates. Lodge Farm comprises a square shaped residential building, with several barns and outhouses. There are numerous above ground storage tanks and numerous pieces of

Item	Brief Description
	machinery across the compound. There is also a chemical storage room (although no chemical storage was noted). Fertiliser was stored in a separate barn. At the southern extent of Barn Lane, there was a stockpile of plasterboard chippings used to lime the fields. Some field entrances have been stoned with brick and concrete fragments. A manure stockpile was noted in a field southeast of the site boundary.
Topography and geomorphological features	In general, the topography of the site is a wide valley centred on Milton Malsor Brook in Area B. However, small topographical changes were observed and are considered to be generally associated with the change in geology and surface water drainage. **Area A** Area A is relatively flat with a gentle downward slope to the east. Given the proximity to the canal, it is considered likely this area may have been raised and is marginally higher than the area around it. **Area B** Area B is characterised by a gently rolling hills with a central valley. The valley is lowest in the approximate centre of the area and is orientated in a north to south direction. This is associated with Milton Malsor Brook, which bisects the site and flows from south to north. The brook is joined by two tributaries, which flow in ditches on the field boundaries from the southwest and southeast. Generally, the valley floor is relatively flat except in the northeast where there is a steeper upwards slope (associated with the local geology in this area). There are some steep slopes associated with earthworks for the Grand Union Canal, which forms part of the boundary of the site. North of this are earthworks associated with a former railway line. Further earthworks associated with the A43 are noted in the southwest of this Area, with the carriageway elevated above the site. **Area C** The west of Area C is relatively flat. However, east of Barn Lane the site slopes upwards to its highest elevation adjacent to the railway line. A spring line (marked by hydrophilic grasses) was noted at the base of a steep slope approximately 50m south of the southeast site boundary. There was evidence of a landslip on the railway embankment in this area. The slip appeared to have been toe-loaded and monitoring inclinometers or wells placed along its length. There is evidence of earthworks in the south of Area C. Anecdotal evidence suggests the ground levels have been raised with arisings from Roade Cutting (railway) to the southeast. Earthworks are also present in the northwest of the site (Rathvilly Farm), where ground levels are unnaturally raised.
Vegetation	With the exception of the occasional ploughed field, the filling station, transport yard and farm yards, the site is covered in grass or crop.
Archaeology	Ridge and furrow was noted in some fields.
Surrounding land	The site is in a rural setting and surrounded predominantly by fields. The exception is the village of Milton Malsor, which forms part of the northern boundary of Area C and the northeastern boundary of Area B. The area to the southwest of Area B (central south of the total site) is occupied by a trading estate including a sewage treatment works, food recycling facility, workshop and caravan sales.

2.3 Site History

A detailed summary of the site history derived from a review of historic mapping is provided in the desk study report. The site has remained mainly as farmland since the earliest map edition of the late 19th century with development essentially limited to:

- a filling station in the west adjacent to the A43 (now disused, the tanks were decommissioned and filled with foam in 2004);
- Lodge and Manor Farms in the centre and east of the site;
- two former sand and gravel pits in the northwest and north of the site, with the pit in the northwest later filled as an inert landfill; and
- embankments carrying the Grand Union Canal and former Great Central Railway in the southwest corner of the site.

In addition, numerous small farm buildings have been constructed across the site and demolished later in the 20th century. Adjacent development includes the existing highways and railways, the transport yard to the northwest and the Business Park and housing to the south.

2.4 Geology

The general geology of the site area is shown on the 1:50,000 geological map of Towcester (Sheet 202) and is summarised in Table 2.3.

Table 2.3: Geology

Location	Age	Stratigraphic Name	Description
Central valley	Recent	Alluvium	Normally consolidated sandy clay.
Northeast			
North	Pleistocene	Glaciofluvial Deposits	Sand and gravel.
Locally in the northwest		Glacial Till (Oadby Member)	Over consolidated gravelly clay with associated sand and gravel deposits.
Locally in the east			
Southeast corner	Jurassic	Wellingborough Member	A massive argillaceous, sandy, shelly and shell-detrital limestone associated with rubbly oyster-rich limestone and marl and mudstones.
Southeast corner		Rutland Formation (undifferentiated)	Fluviatile and lacustrine sandstones, passing into grey marine mudstone and non-marine mudstone and siltstone.
Southeast corner		Stamford Member	A pale greenish grey to yellowish and white, generally massive, fine-grained, generally friable, quartzose, unfossiliferous sandstone or siltstone.
Southeast corner		Northampton Sand Formation	Sandy, berthierine-ooidal and sideritic ironstone, greenish grey where fresh, weathering to brown limonitic sandstone, typically displaying a box-stone structure. The basal part, is commonly muddy and less ferruginous.
Entire Site		Whitby Mudstone Formation	Dark grey, fossiliferous mudstone and siltstone with fine grained sandstone beds and fossiliferous limestones.

Location	Age	Stratigraphic Name	Description
Centre and northwest		Marlstone Rock Formation	Sandy, ooidal, ferruginous limestone with shell fragments.
Centre and northwest of the area		Dyrham Formation	Pale to dark grey, silty, sandy mudstone weathering to a yellow clay.

2.5 Mineral Extraction

There are three former sand pits on site in the northwest, north and northeast. The pit in the northwest was landfilled under license, and may extend further to the west into the transport yard adjacent to the site in the northwest corner. The sand pit in the north of the site remains open. In the northeast, the sand pit has been infilled in an uncontrolled manner.

Anecdotal information (confirmed by site investigation) suggest the infill material of the northwestern pit consists of arisings from the construction of the M1. Based on the site topography, it is possible the pit in the northeast of the site is filled above the pre-quarrying level.

The northern part of the site is designated as a Mineral Safeguarding Area (MSA) under the Northamptonshire Minerals and Waste Local Plan (MWLP) (adopted May 2017).

The northeastern corner of the site is within the 300m buffer of an allocated sand and gravel extraction site (M1: Milton Malsor), which relates to a 1.2 million tonne resource at Maple Farm. However, Hydrock do not believe the proposed SRFI development presents a risk to the future viability of M1: Milton Malsor as the allocated sand and gravel extraction site (M1: Milton Malsor) is located to northeast of the village of Milton Malsor, to the east of the Northampton Loop Rail line, and to the north of Collintree Road. As such, the allocated sand and gravel extraction site (M1: Milton Malsor) is separated from the proposed SRFI development site by existing residential development and major pre-existing infrastructure in the form of roads and the Northampton Loop Rail line and there is no viable physical link between the proposed SRFI development and M1: Milton Malsor and as such, both operations are able to co-exist without impact on the other.

2.6 Hydrogeology

The aquifer designations given in Table 2.4 are based on the Environment Agency interactive aquifer designation map. Additional information on the hydraulic characteristics of the geological units has been abstracted from Allen *et al* (1997) and Jones *et al* (2000).

Table 2.4: Hydraulic Characteristics of Strata

Stratum	Aquifer Designation	Hydraulic Characteristics
Alluvium	Secondary Undifferentiated	May be a source of groundwater but vertical and lateral variability means these aquifers are locally changeable.
Glaciofluvial Deposits	Secondary A Aquifer	May be a localised source of groundwater.

Stratum	Aquifer Designation	Hydraulic Characteristics
Glacial Till	Unproductive Strata	Maybe a source of localised groundwater but low permeability and porosity make these poor aquifers. Likely to behave as an aquiclude.
Wellingborough Member	Secondary A Aquifer	Likely to be significantly permeable and may be a localised source of groundwater.
Rutland Formation (undifferentiated)	Secondary B Aquifer	Overall likely to be relatively impermeable, however some of the subordinate units (Wellingborough Limestone) are likely to be permeable and may be confined between beds of low permeability. Overall permeability is likely to be greater in the horizontal direction that the vertical.
Stamford Member	Secondary B Aquifer	May include beds of sand and sandstone that are permeable, however limited thickness and variable composition are likely to mean the Stamford Member is of limited potential as an aquifer.
Northampton Sand Formation	Secondary A Aquifer	May be a localised source of groundwater.
Whitby Mudstone Formation	Unproductive Strata	Maybe a source of localised groundwater but low permeability and porosity make these poor aquifers. Likely to behave as an aquiclude.
Marlstone Rock Formation	Secondary A Aquifer	May be a localised source of groundwater.
Dyrham Formation	Secondary Undifferentiated	May be a source of groundwater but vertical and lateral variability means these aquifers are locally changeable.

The site is not within a Source Protection Zone (SPZ) and there are no SPZ in the vicinity of the site. There are no recorded groundwater abstraction licenses within 2km of the site. It is known that the water supply at Lodge Farm is from a private borehole.

2.7 Hydrology and Flooding

The following surface waters are present at the site (Table 2.5).

Table 2.5: Surface Water Features

Feature	Location Relative to Site
Milton Malsor Brook	Crosses the western side of the site on a south to north course.
Ditches	The centre and west of the site is drained by open ditches which ultimately fall to the Milton Malsor brook. The ditches appear to originate at the railway, and may collect water from small ponds or springs present within the site at various places along the field boundaries.

Feature	Location Relative to Site
Milton Malsor Brook (Eastern Arm)	The Eastern Arm rises in a marsh area to the northwest of Lodge Farm in the east of the site.
Grand Union Canal	The Grand Union Canal is carried on an embankment adjacent to the southwest corner of the site. There is a culvert underneath the canal carrying surface water, presumably originating from pre-existing land drainage constructed prior to the canal and railway. The canal appears to be leaking causing overland flow over the field in the southwest corner of the site.

2.8 Waste Management and Hazardous Substances

The following waste management sites are recorded within 250m of the site (Table 2.6)

Table 2.6: Waste Management Sites

Site Name	Location	Details
Gayton Road, Milton Malsor	On site. Northwest corner.	Operated by Galliford Roadstone. No details on the waste placed here beyond the designation 'Inert'. Occupies the former gravel pit identified on the historical maps.
Milton Malsor Landfill	Adjacent to Gayton Road north of site (10m)	Licensed to receive non-biodegradable wastes. Now closed.
Proposed recycling centre	Old Sewage Works	Planning application for a recycling centre.
Milton Sand Pit	Adjacent to Gayton Road north of site (90m)	Licensed to receive inert liquid sludge.
Rothersthorpe	125m north.	Licensed to receive inert waste. No further details available.
Gayton Landfill Site	335m west.	This site is classified as being Contaminated Land under Part 2A of the Environmental Protection Act 1990.

2.9 Pollution Incidents

A significant pollution incident occurred at Gayton Marina in June 2015 when kerosene leaked from the BPA pipeline into the Grand Union Canal. Whilst it is not anticipated that this event will have had a significant impact on land quality at the site, there is a small possibility of an impact in the southwest if the canal had been leaking at the time. Further details are provided in the Desk Study Report.

2.10 Radon

A British Geological Society (BGS) radon risk report (GR210997/1) has been obtained for the site and indicates that it is in a Radon Affected Area where recorded radon concentrations in 1-3% of

homes are above the action level. The source of radon at this site is likely to be the Marlstone Rock Formation.

Consideration should be given to fitting basic protection measures on the 'as low as reasonably practicable' principle in view of the legal responsibilities of employers with commercial properties.

2.11 Preliminary Conceptual Site Model

Table 2.7 lists the plausible contaminant linkages which have been identified in the Desk Study Report. These are considered as potentially unacceptable in line with guidelines published in CLR 11 and additional assessment is required.

Linkages has been assessed in general accordance with guidance in CIRIA Report C552 (Rudland *et al* 2001) but with the addition of a 'no linkage' category.

It should be noted that whilst the risk assessment process undertaken in this report may identify potential risks to site demolition and redevelopment workers, consideration of occupational health and safety issues is beyond the scope of this report and need to be considered separately in the Construction Phase Health and Safety Plan.

Table 2.7: Exposure Model – Preliminary Risk Assessment of Source-Pathway-Receptor Contaminant Linkages

Sources	Possible Pathways	Receptors	Probability	Consequence	Risk Level	Comments
On site						
Landfill – asbestos, PAH, petroleum hydrocarbons, PCB, metals	Ingestion Dermal contact Inhalation	Neighbours End users	Likely	Medium	Moderate	As there are landfills on site the likelihood of landfill materials being present beneath any capping is high. These materials are likely to be in various states of decay and may be generating leachate and ground gas.
Landfill – ground gas	Migration Inhalation		Likely	Severe	High	
Landfill - leachate	Leachate	Surface water Groundwater	Likely	Medium	Moderate	It is likely the landfills will be generating leachate. However, it is not known if the landfills have any leachate recovery system.
Farm yard – above ground fuel storage	Ingestion Dermal contact Inhalation	End users	Low	Mild	Low	The storage tanks observed appeared to not have leaked. Leaking storage tanks are likely to have a localised impact only.
	Migration	Groundwater	Low	Medium	Moderate	Lodge Farm is on Oadby Till and Whitby Mudstone Formation which is likely to prevent any extensive migration of any contaminants. Run-off may lead to surface water impaction.
		Surface water Ecology	Low	Medium	Moderate	
Farm yard – storage of chemicals, accidental spillages etc.	Ingestion Dermal contact Inhalation	End users Ecology	Low	Mild	Low	Most chemicals appear to be stored in pellets but may become mobile when wet.
	Migration	Surface water Groundwater	Low	Mild	Low	Lodge Farm is on Oadby Till and Whitby Mudstone Formation which is likely to prevent any extensive migration of any contaminants. Run-off may lead to surface water impaction.

Sources	Possible Pathways	Receptors	Probability	Consequence	Risk Level	Comments
Farmland – Made Ground from uncontrolled burials, poor practice, fly-tipping	Ingestion Dermal contact Inhalation	End users	Low	Medium	Moderate	Risks are likely to be limited in lateral and vertical extent.
		Livestock	Low	Mild	Low	
	Migration	Groundwater	Low	Medium	Moderate	
Farmland – use of pesticides, muck spreading and manure storage.	Ingestion Dermal contact Inhalation	End users	Low	Mild	Low	As well as a risk to human health there is a risk to Controlled Waters from nitrates.
	Migration	Surface water Groundwater	Low	Mild	Low	
Filling station – hydrocarbon leakages and spillages.	Ingestion Dermal contact Inhalation	End users Ecology	Likely to low	Medium	Moderate	Any leakages and spillages from the filling station may have occurred over a long period of time. The filling station is over Whitby Mudstone Formation which may limit the lateral and vertical extent of any contaminants.
	Migration	Surface water Groundwater	Likely to low	Medium	Moderate	
Filling station – vapours.	Inhalation	Neighbours End users	Low	Medium	Low	
Transport yard – metals, acetone, PAH, organolead	Ingestion Dermal contact Inhalation	End users Ecology	Likely to low	Medium	Moderate	Leakages and spillages are likely to have occurred over the operational life of the transport yard.
	Migration	Surface water Groundwater	Low	Medium	Moderate	There is a low likelihood the transport yard may impact groundwater but this would need to be confirmed by groundwater sampling.

Sources	Possible Pathways	Receptors	Probability	Consequence	Risk Level	Comments
Ground gas from natural soils (Alluvium)	Migration Inhalation	Neighbours End users Buildings	Low	Severe	Moderate	The potential for ground gas generation in the alluvium is likely to be limited. Alluvium is limited in lateral extent across the site.
Off site						
Sewage treatment works – metals, pH, hydrocarbons	Migration	Surface water Groundwater	Low	Medium	Moderate	The sewage treatment works is only small and leakages are likely to be limited but this would need to be confirmed by groundwater sampling.
Food waste recycling – metals, phenols, PAH.	Migration	Surface water Groundwater	Low	Medium	Moderate	There is a low likelihood the food recycling facility may impact groundwater which would flow beneath the site but this would need to be confirmed by groundwater sampling.
Railway Land – metals, defoliants, PAH, PCB	Migration	End users Surface water Groundwater	Low	Medium	Moderate	It is unlikely that chemicals used on the railway will impact the site.
Off-site landfill – ground gas	Migration Inhalation	End users Buildings	Likely	Severe	High	As landfills are on site then the likelihood of landfill materials being present beneath any capping is high. These materials are likely to be in various states of decay and may be generating leachate and ground gas.
Ground gas from natural soils (Alluvium)	Migration Inhalation	End users	Low	Severe	Moderate	The potential for ground gas generation in the alluvium is likely to be limited. Alluvium is limited in lateral extent across the site.
Radon	Migration Inhalation	End users	Likely	Medium	Moderate	Basic radon protection measures are required.

2.12 Geotechnical Hazard Identification

Potential geotechnical hazards based on the expected ground conditions are listed below:

- The presence of landfills in the north of the site and the potential for highly variable and poorly compacted landfill soils.
- Made Ground leading to excessive settlement of foundations and infrastructure.
- Seasonal shrinkage and swelling of clay leading to settlement and heave of foundations when located within the influence of trees and vegetation.
- The presence of highly variable soils (silt, clay, sand, clay, gravel) associated with the alluvial channels along the streams.
- Low strength and compressible ground causing excessive settlement of foundations and infrastructure elements.
- Hard strata where the Marlstone Rock Formation outcrops at the surface.
- Differential settlements between areas of loose/soft ground and dense/hard/stiff ground.
- Running sands, loose landfill and shallow groundwater, leading to difficulty with excavation.
- Attack of buried concrete by aggressive ground due to potentially sulphate bearing soils.
- Sulphates affecting soil modification by lime addition and potential delays to earthworks programme if the ground conditions are poorly understood.
- Low permeability soils leading to a lack of infiltration for SUDS drainage.
- Potential for relict slip surfaces in the Whitby Mudstone Formation and Dyrham Formation. Geotechnically, there is a low risk from relict shear planes. However, if present, they will need to be taken into account in detailed design.

3.0 GROUND INVESTIGATION

3.1 Investigation Rationale

The ground investigation rationale based on the findings of the preliminary risk assessment is summarised in Table 3.1.

Table 3.1: Investigation Rationale

Exploratory Holes	Purpose
Cable Percussion	
BHG01 – BHG025	To provide general site coverage on an approximate 600m grid. To assess deeper ground conditions and allow SPTs and samples for geotechnical characterisation. To collect undisturbed samples. Installation of gas and groundwater monitoring standpipes in selected holes.
BHA01- BHA015	To target areas anticipated to be underlain by deposits of alluvium. To assess deeper ground conditions and allow SPTs and samples for geotechnical characterisation. To collect undisturbed samples. Installation of gas and groundwater monitoring standpipes to assess groundwater conditions in floodplain areas.
BHL01 – BHL011	To target the landfill in the northwest of the site. To assess deeper ground conditions and allow SPTs and samples for geotechnical characterisation. To collect undisturbed samples. Installation of gas and groundwater monitoring standpipes in selected holes to assess gas emissions and groundwater conditions within and beneath the landfill deposits.
BHR001 to BHR005	To target proposed rail bridges. To allow geotechnical characterisation, undertake SPTs and collect undisturbed samples. To allow installation of groundwater monitoring standpipes in selected holes.
BHRT001 and BHRT002	To target proposed Northampton Road underpass. To allow geotechnical characterisation, undertake SPTs and collect undisturbed samples. To allow installation of groundwater monitoring standpipes in selected holes.
BHRB002	To target proposed A43 overbridge (eastern abutment). To allow geotechnical characterisation, undertake SPTs and collect undisturbed samples. To allow installation of groundwater monitoring standpipe.
Dynamic (window) sample boreholes	
WSCL01 – WSCL05	To assess the ground conditions within the Diocese of Peterborough land with minimal ground disturbance. To allow SPTs and samples for geotechnical characterisation.
WSLF01 – WSLF05	To assess the ground conditions within Lodge Farm. To allow samples to be taken for contamination analysis. To allow SPTs and samples for geotechnical characterisation.
WSS01 – WSS09	To assess the ground conditions within the former filling station. To allow samples to be taken for contamination analysis. To allow installation of groundwater and gas monitoring standpipes. To allow SPTs and samples for geotechnical characterisation.

Exploratory Holes	Purpose
WSBL01 – WSBL10	To delineate the landfilled ground in the northeast of the site. To allow the installation of gas monitoring standpipes.
Trial Pits All trial pits were designed to: • assess shallow ground conditions and the construction of a geological model. • allow in-situ hand shear vane testing to be undertaken. • allow collection of samples for contamination testing. • allow collection of samples for samples for geotechnical characterisation. • assess trench stability, over break potential and ease of excavation. • allow soil infiltration testing in selected locations. In addition, pits were set out to target specific features at the site.	
TPG001 to TPG068	To provide general site coverage on an approximate 200m square grid.
TPA001 – TPA050	To allow characterisation of conditions within anticipated areas of alluvium.
TPL010 to TPL011	To allow characterisation of conditions within the landfill in the northwest of the site.
TPRT001 to TPRT008	To allow characterisation of conditions within the area of the proposed Northampton Road underpass.
TPT001 to TPT028	To investigate geotechnical and contamination target features identified in the Desk Study Report. To allow sampling in the area of potential contamination sources.
HPS01 to HPS04	To provide near surface samples for contamination analysis in area of water leakage from the canal.

3.2 Ground Gas Regime

It is judged from the available evidence that the gas generation potential over the majority of the site is low and the sensitivity of the development is low. However, in the northwest, there is a moderate potential for gas generation on account of the presence of a landfill, understood to have received inert waste. There is a suspected landfill in the northeast corner of the site for which no licence was applicable. Anecdotally, the landfill received waste arisings from the construction of the M1.

Based on the preliminary assessment, an appropriate minimum monitoring regime is 6 readings over 3 months, provided other monitoring requirements are also met, such as prevailing atmospheric pressure conditions (for example, BS 8485:2015 suggests monitoring shall include a period of falling atmospheric pressure).

3.3 Groundwater Regime

To provide a full understanding of the groundwater regime, monitoring of the installed wells is proposed over a twelve month period.

3.4 Site Works

The fieldwork took place between 22nd August and 13th October 2016 and 6th June, 2017, in phases as access became available for each land ownership, and is summarised in Table 3.2.

The weather conditions during the fieldwork and were dry, with hot weather prevailing during August and early September. Works undertaken on 20th February 2017 were undertaken on a dry, cold day. Works on 19th and 20th April 2017 were undertaken in overcast conditions with occasional rain. On 6th June 2017, heavy rain occurred.

The position of site investigation locations set out using a GPS total station are shown on the Ground Investigation Plan in Appendix A. The logs, including details of ground conditions, soil sampling, *in situ* testing and any installations, are presented in Appendix B.

Table 3.2: Summary of Site Works

Activity	Method	No.	Range Depth (m)	*In Situ* Tests	Notes (e.g. Installations)
Boreholes	Cable percussion	49	3.11 – 15.55	SPT	Standpipe installations in selected holes.
	Dynamic sampling	28	1.90 – 5.45	SPT in selected holes	Standpipe installations in selected holes in the filling station area and Rathvilly Farm pit.
Trial pits	JCB 3CX backhoe	164	1.1 – 3.70	Hand shear vane (HSV)	Infiltration tests in 11 trial pits in the north of the site underlain by glaciofluvial sand.
	Hand excavated	4	0.20	-	Shallow surface samples for chemical sampling.

3.5 Geo-Environmental Testing

3.5.1 Sampling Strategy and Protocols

Investigatory hole locations were determined by reference to the conditions identified in the preliminary risk assessment. Specific features were targeted including:

- Landfill area in northwest;
- Suspected landfill in northeast (Rathvilly Farm);
- Lodge Farm;
- Former filling station;
- Former farm buildings;
- Areas of fly tipping; and
- Areas of Made Ground in the southeast of the site.

A reasonably even spacing was used for the remainder of the site. Samples were taken stored and transported in general accordance with BS 10175:2011+A1:2013.

3.5.2 Geo-environmental Monitoring

Gas monitoring boreholes have been monitored on 8 occasions to date. The results are presented in Appendix D. Monitoring is ongoing.

3.5.3 Geo-environmental Laboratory Analyses

Wherever possible, UKAS accredited procedures and MCERTS have been used and the chemical test certificates are provided in Appendix F. The geo-environmental analyses undertaken on soils are summarised in Table 3.3.

Table 3.3: Summary of Sample Numbers for Geo-environmental Analyses of Soils or Other Solids

Determinand Suite (see Appendix E for Details of Suites)	Made Ground (Landfill Area)	Made Ground (Rathvilly Farm Pit)	Made Ground (Roade Cutting)	Made Ground (Farm)	Made Ground (Filling station)	Topsoil	Natural Soils
Hydrock default suite of determinands for solids	12	21	31	9	6	122	19
Volatile organic compounds (VOC target list plus TIC by GC-MS	2	0	0	4	0	0	0
Benzene, toluene, ethylbenzene and xylene (BTEX) by GC-MS)	0	0	4	8	18	0	0
Semi-volatile organic compounds (SVOC target list plus TIC by GC-MS)	2	0	0	4	0	0	0
Total petroleum hydrocarbons by GC-FID (Hydrock Level 1 suite)	0	0	0	0	9	0	5
Total petroleum hydrocarbons by GC-FID (Hydrock Level 2 suite)	2	15	4	8	5	4	1
Pesticide screen	0	0	3	1	0	21	0
Asbestos Bulk ID	0	4	0	0	0	0	1

The geo-environmental analyses undertaken on waters, leachates (eluates) or other liquids are summarised in Table 3.4.

Table 3.4: Summary of Sample Numbers for Geo-environmental Analyses of Waters

Determinand Suite (see Appendix E for Details of Suites)	**Made Ground (landfill Area)**	**Made Ground (Roade Cutting)**	**Made Ground (filling station)**	**Natural Soils**
Hydrock default suite of determinands for waters	6	2	5	18
Total petroleum hydrocarbons by GC-FID (Hydrock Level 1 suite)	2	1	0	2
Total petroleum hydrocarbons by GC-FID (Hydrock Level 2 suite)	0	0	5	3

3.6 Geotechnical Testing

Wherever possible, UKAS accredited procedures have been used and the geotechnical test certificates are provided in Appendix C. The tests undertaken are summarised in Table 3.5.

Table 3.5: Summary of Sample Numbers for Geotechnical Tests

Test	Made Ground - Landfill	Made Ground – Roade Cutting	Alluvium	Glaciofluvial Deposits	Glacial Till	Stamford Member	Northampton Sand Formation	Whitby Mudstone Formation	Marlstone Formation	Dyrham Formation
Natural moisture content	5	9	12	15	4	1	1	41	4	13
Atterberg limit determination	2	4	6	4	1	1	0	14	1	3
Particle size distribution	2	2	5	7	0	1	0	6	1	2
Particle density	2	1	3	4	1	0	1	13	2	5
Remoulded CBR	1	1	4	2	1	0	0	6	1	2
2.5 kg compaction	0	1	2	1	0	0	1	4	0	2
4.5 kg compaction	2	0	1	3	1	0	0	9	2	3
Moisture content – MCV calibration	0	0	0	0	0	0	0	1	0	1
Undrained triaxial compressive strength	0	2	3	1	0	0	0	28	0	5
One dimensional oedometer consolidation	0	0	1	0	0	0	0	2	0	2
Consolidated undrained triaxial shear strength	0	0	1	0	0	0	0	1	1	1
60mm shear box	0	0	0	0	0	0	0	1	0	0
300mm shear box	0	0	0	2	0	0	0	0	0	0
BRE SD1 suite including dependent options	3	3	9	6	1	0	0	20	3	6

4.0 GROUND INVESTIGATION RECORDS AND DATA

4.1 Physical Ground Conditions

4.1.1 Introduction

The following presents a summary of the properties of the ground and groundwater conditions encountered, based on field observations, interpretation of the field data and laboratory test results, taking into account drilling, excavation and sampling methods, transport, handling and specimen preparation.

All relevant data from the Hydrock investigation detailed in Section 3.0 is used from this point forward. Derived[1] geotechnical parameters are presented also. For the purposes of property designation, soils are divided into fine soils (clays and silts) and coarse soils (sands, gravels, cobbles and boulders) in accordance with BS 5930.

Equivalent approximate undrained shear strengths (c_u) and equivalent approximate coefficients of volume compressibility (m_v) have been calculated from recorded SPT N values, adopting f_1 and f_2 values respectively (based on CIRIA Report 143 (Clayton 1995)) appropriate to the recorded plasticity. The angle of shearing resistance (ϕ') of coarse soils has been derived from the uncorrected standard penetration resistance N-value using the relationship published by Peck, Hanson and Thornburn (1967).

4.1.2 Summary of Strata Encountered

Details are provided in the logs in Appendix B, a summary is presented in Table 4.1 and the individual strata are described in the sections below. Relevant cross-sections/contour plans/isopachyte diagrams are presented in Appendix A.

Table 4.1: Strata Encountered

Stratum	Brief Description	Depth to Top (m bgl)	Depth to Base (m bgl)	Thickness (m)
Topsoil	Topsoil is present over the majority of the site. Generally the topsoil consists of clay and sandy clay. In the north of the site the topsoil is sand where it overlies the Glaciofluvial deposits.	0.00	0.10 – 0.60	0.10 – 0.60
Made Ground (Landfill)	The landfill deposits consist of interbedded deposits of clay and sand with subordinate pockets and cobble and boulder size particles. Locally, deposits of organic clay are present. Constituents include concrete, brick, timber, plastic, ceramic, metal, and occasional ash and slag.	0.20 – 0.35	0.90 – 7.50	0.55 – 7.00

[1] **Derived values** of geotechnical parameters and/or coefficients are obtained from test results, by theory, correlation or empiricism in line with BS EN 1997-2:2007, Section 1.6.

Stratum	Brief Description	Depth to Top (m bgl)	Depth to Base (m bgl)	Thickness (m)
Made Ground (Roade Cutting)	This deposit is understood to comprise arisings from the excavation of Roade Cutting and consist of soft and firm sandy gravelly clay with cobble and boulder size fragments of limestone and concrete, and occasional brick, ash, clinker, terracotta. In places a relict topsoil was identified at the base of the deposit.	0.00 - 0.30	0.30 - >3.00	0.30 - >3.00
Made Ground (Rathvilly Farm Pit)	Anecdotally this deposit is understood to consist of arisings from the construction of the M1. The material consists of variable sandy gravelly clay and sandy gravel with cobbles and boulders, and some deposits of ash gravel. Aside from the ash, gravel includes brick, sandstone, concrete, mudstone and occasional timber. Asbestos Containing Materials (ACM) are also present.	0.00 – 4.50	0.50 – 4.50	0.20 – 4.50
Made Ground (Filling Station)	At the former filling station the Made Ground consists of a surface layer of asphalt overlying sandy gravel and gravelly sand fill, in turn overlying a basal layer of reworked natural clay. The strata include material such as concrete, brick, limestone, granite and ironstone. Locally, the clay layer is absent.	0.00	0.70 – 1.70	0.70 – 1.70 (typically 0.90 to 1.20)
Made Ground (Lodge Farm)	Made Ground at Lodge Farm consists of sandy gravelly clay with occasional man-made inclusions, gravelly sand and sandy gravel. Gravel includes ash and clinker and limestone, sandstone, brick and concrete. Locally asbestos containing material is present in the Made Ground at Lodge Farm.	0.00	0.60 – 1.30	0.60 – 1.30
Made Ground (Canal Embankment)	Made Ground is present in the southwest corner of the site at the embankments carrying the canal and former railway. The Made Ground consists of sandy gravelly clay with cobbles. Gravel and cobbles consist of limestone, flint, coal and man-made material such as brick, concrete, glass.	0.00	1.70	1.70
Made Ground (other areas)	Made Ground is present in a number of discrete areas around the site in the form of general detritus associated with farming activities and as hardcore reinforcement placed to gateways. Deposits include sandy gravelly clay, sandy clay and gravelly sand. Man-made inclusions are frequently present including concrete, brick, tile, glass, ash, clinker, metal and timber.	0.00	0.15 – 1.25	0.15 – 1.25
Alluvium	In the floodplain of the Milton Malsor Brook centre and south of the site, the Alluvium typically consists of firm clay and sandy clay, with a basal bed of clayey sandy gravel present in places. In the north of the site, at the Milton Malsor Brook (Main and Eastern Arm), the alluvium included deposits of silt, sand and organic clay.	0.10 – 1.20	0.60 – 3.20 (typically 1.50)	0.40 – 3.00 (typically 1.20)

Stratum	Brief Description	Depth to Top (m bgl)	Depth to Base (m bgl)	Thickness (m)
Glaciofluvial Deposits	The Glaciofluvial Deposits are present in the north of the site and consist of sand, in places slightly gravelly and gravelly and with subordinate fines content. Gravel is ironstone and limestone.	0.20 – 4.50	0.75 - >10.00	0.45 - >10.00
Glacial Till (Oadby Till)	Glacial Till is present along the higher ground at the eastern edge of the site and in the northwest corner. At two locations in the centre of the site, relatively thin deposits of Glacial Till were found either near surface or underlying Alluvium. The Glacial Till consists of slightly sandy slightly gravelly and gravelly clay with gravel of flint, limestone, chalk and mudstone.	0.15 – 2.60	0.50 – 3.20 (typically 1.90m)	0.20 – 2.75 (typically 1.30m)
Wellingborough Limestone Member	A thin deposit of clayey gravelly sand was encountered near surface in the southeast corner of the site, including gravel of flint and shell fragments.	0.30	0.60	0.30
Rutland Formation	The Rutland Formation (undifferentiated) was encountered in the southeast corner of the site. The Rutland Formation consists of sandy clay with thin beds of fine sand.	0.60	1.40	0.80
Stamford Member	The Stamford Member is present in the southeast corner of the site. The Stamford Member consists of clay clayey sandy gravel sized residual fragments of sandstone.	0.30 - 1.40	0.50 - 1.80	0.20 - 0.40
Northampton Sand Formation	The Northampton Sand Formation is present in the southeast corner of the site. The Northampton Sand consists of gravelly sand with cobbles and beds of clay. Cobbles are sandstone and ironstone.	0.50 – 1.80	2.50 – 2.70	0.90 – 2.00
Whitby Mudstone Formation	The Whitby Mudstone is present over the majority of the site, with the exception of the valley floors in the north. The Whitby Mudstone consists of stiff and very stiff fissured clay with some residual mudstone fragments and lithorelicts and crystals of gypsum.	0.20 - >10.00	0.40 – 7.20 (where fully penetrated)	Not proven
Marlstone Formation	The Marlstone Rock Formation was encountered outcropping in the centre, northwest and extreme northeastern corner of the site only, and underlying the Whitby Mudstone at depth. The Marlstone Formation typically consists of fossiliferous limestone, ironstone and limestone with subordinate sandstone and mudstone beds.	0.35 – 7.20	1.10 – 7.60 (where fully penetrated)	0.20 – 2.00 (typically 0.75m)

Stratum	Brief Description	Depth to Top (m bgl)	Depth to Base (m bgl)	Thickness (m)
Dyrham Formation	The Dyrham Formation was encountered outcropping in the lower ground in the northwest and centre of the site and underlying the Marlstone Rock. The strata consists of stiff clay, sandy clay and mudstone with subordinate beds of sand, sandstone, silt and limestone. Gypsum crystals and fossils are present in places. Generally, the Dyrham Formation is coarser in particle size than the Whitby Mudstone.	0.60 – 13.75 (where encountered)	Not proven	Not proven

4.1.3 Topsoil

For the purposes of this report, topsoil is defined as the upper layer of an *in situ* soil profile, usually darker in colour and more fertile than the layer below (subsoil), and which is a product of natural chemical, physical, biological and environmental processes, but does not imply compliance with BS 3882:2015. A Soil Resource Survey covering the reuse of site won topsoil within landscaping at the proposed development is to be undertaken by a third party specialist.

Where the Made Ground was not encountered, the exploratory holes encountered topsoil. Typically the Topsoil consists of clay, locally with occasional man-made inclusions. In the north of the site, topsoil overlying the Glaciofluvial Deposits was generally sand, reflecting the nature of the underlying geology.

4.1.4 Made Ground

The investigation has identified Made Ground in six discrete areas associated with development of adjacent rail, highways and canals, Lodge Farm, and extraction of Milton Sand and subsequent landfilling in the northwest. In addition to these areas, pockets of Made Ground are present in places associated with general agricultural activity as would be reasonably expected on a site of this size in agricultural use.

Landfill Deposits

The northwest corner of the site was formerly quarried for Milton Sand and subsequently landfilled under license. Landfilling was undertaken by Galliford Roadstone and commenced in 1993. The site was licensed to receive inert waste. A maximum thickness of 7.50m of landfill deposits were proven, with the deposits with increasing thickness corresponding with the rise in topographic level. The landfill deposits are variable in nature and consist predominantly of sandy gravelly clay and clayey sand. Material present as gravel includes mudstone, flint, ironstone, chalk, limestone, concrete, brick, and occasional timber, plastic, ash, slag, metal and glass. Cobble and boulder size particles are present, including brick, concrete and timber. At one location in the northeast of this landfill (TPL011), organic clay was encountered.

Particle size distribution analyses within the Landfill deposits indicate fines content of between 11% and 62%, sand content between 11% and 27% and gravel content between 11% and 38%. Cobbles content of up to 40.8% is recorded. It is noted from fieldwork boulder sized inclusions are present within the landfill.

SPT 'N' values within the landfill were typically less than 10, in one case with a very high value recorded associated with a boulder sized obstruction. Clay present is of high plasticity. The deposits can be broadly characterised as interbedded loose gravelly sand and soft sandy gravelly clay.

Roade Cutting

In the southeast of the site a deposit of Made Ground is present at an approximately rectangular mounded earth embankment generally greater than 3.00m in thickness. The soil consists of soft and firm clay with cobble and boulder size inclusions of limestone and concrete, and occasional gravel of flint, limestone, brick, clinker and terracotta tile fragments. At one location, an underlying relict topsoil stratum was encountered. Anecdotal information suggests that the material is arisings from the construction of the nearby Roade Cutting and the nature of the deposit would tend to support this interpretation.

Particle size distribution analyses within the Roade Cutting deposits indicate fines content of between 33% and 56%, sand content between 6.8% and 40% and gravel content between 4.2% and 16%. Cobbles content of up to 44% is recorded. It is noted from fieldwork that boulder size inclusions are present within the Roade Cutting deposits.

SPT 'N' values in the Roade Cutting deposits were 6 and 14. A triaxial undrained shear strength of 64kN/m^2 was recorded in a single test. The clay soil is of high plasticity.

Rathvilly Farm Pit

Made Ground was encountered in the northeast corner of the site at the location of an infilled sand pit reported anecdotally. The Made Ground in this area extends to a depth of between 0.50m and 4.50m where the thickness has been fully proven, but may possibly be thicker elsewhere. Based on the site topography, it is anticipated that the Made Ground deposits extend above the original ground level prior to any sand extraction, and is in effect piled up.

Within the Rathvilly Farm pit the Made Ground is variable consisting of predominantly of soft sandy gravelly clay, with some deposits of clayey gravelly sand and fine gravel of ash. Cobbles and large boulders of concrete are present. Gravel includes brick, concrete, sandstone, mudstone, limestone and timber. Asbestos containing material was found at one Hydrock borehole, and was reported also by the archaeological investigation at another location.

Filling Station

At the former filling station, Made Ground consists of a surface layer of asphalt overlying a subbase of limestone gravel and concrete typically extending to a depth of between 0.70m to 0.90m below ground level. In places the pavement construction is underlain by reworked natural clay consisting of firm clay with limestone and brick fragments.

Lodge Farm

Made Ground at Lodge Farm is variable in nature and includes deposits of reworked natural clay with man-made inclusions, sand and gravel of ash and clinker, and gravel of railway ballast. At

one location, fragments of suspected cement bound asbestos sheet were identified in the Made Ground at Lodge Farm.

Canal

A single trial pit was excavated within the canal embankment in the southwest corner of the site. The embankment is constructed of sandy gravelly clay with cobbles. Constituent materials include flint, limestone, ironstone, brick, concrete, coal, shell and glass.

Other Areas

Made Ground is present in a number of discrete areas across the site as a result of agricultural activity. For the purposes of this report these types of deposit have been discussed as a single unit however it should be appreciated that the nature and composition of such deposits is likely to be the subject of considerable variation.

Typically, the Made Ground consists of hardcore placed as reinforcement to tracks, gateways and areas of soft soils adjacent to the brooks. In other areas, the Made Ground consists of largely undisturbed natural topsoil with occasional man-made inclusions.

In places, over 1m thickness of Made Ground is present in these areas, for example at the railway underbridge at Lodge Farm. Here gravelly cobble sand including concrete, brick, tile, glass, plastic and wood is present overlying sandy clay fill. In the northwest of the site clay fill containing ash and brick gravel is present adjacent to the Milton Malsor Brook to a depth of up to 1.25m.

4.1.5 Alluvium

Alluvium is present aligning the Milton Malsor Brook in the western half of the site, and the Eastern Arm in the northeast. Generally, the Alluvial deposits are present along a relatively narrow channel aligned along the brooks. In the north of the site at both the Milton Malsor Brook and the Eastern Arm, the Alluvium immediately adjacent to the streams consists of organic silt and clay, at the Eastern Arm overlying sand and gravel. Further away from the streams, the Alluvium in the north of the site generally consists of variable sandy clay and gravelly clay.

In the south of the site, there is a wider deposit of Alluvium present on the lower ground at the northern end of the Business Park and west of Northampton Road. It is apparent by observation that water may stand in this area of the site during wet weather or seasonally. In this area the Alluvium is variable in thickness consists of clay and sandy clay with occasional gravel of mudstone, flint and ironstone and with occasional rootlets. In places, a basal sand and gravel stratum is present in the south of the site. Gravel is predominantly flint and quartz.

Geological mapping indicates a finger of Alluvium crossing the centre of the site orientated approximately southeast to northwest along a tributary stream of the Milton Malsor Brook. However, the investigation works did not encounter Alluvium along this section of the stream. Nonetheless, it is anticipated that Alluvium is present in this area although not encountered by this investigation and that this alluvial channel is narrow and relatively steep sided.

Natural moisture contents in the fine units of the Alluvium range from 14% to 84% and modified plasticity indices range from 17% to 47%. On this basis these soils are classified as of clay of intermediate and high plasticity, and silt of very high and extremely high plasticity. Particle size distribution analyses indicated the Alluvium to consist of between 2% and 84% fines, 5.4% and 84.5% sand, and 10.4% and 53.3% gravel, including both coarse and fine units present in the Alluvium.

Undrained shear strength parameters of the cohesive units of these materials based on *in situ* and laboratory testing are presented in Table 4.2.

Table 4.2: Soil Strength Results and Derived Values for Alluvium

SPT (N-Value) (Range)	Shear Strength (Range) c_u (kPa)	Method	No. of Results
6 - 17	25 - 70	Correlation with Stroud (1975) based on 'average' plasticity	6
-	5 - 104	Hand shear vane	13
-	26 - 42	Laboratory triaxial test	3

Approximate coefficients of volume compressibility (m_v) derived from the *in situ* SPT testing within the cohesive units of these materials range from 0.14m^2/MN to 0.40m^2/MN adopting an f_2 value of 0.42 (based on the 'average' plasticity) and from 0.27m^2/MN to 0.61 m^2/MN based on the laboratory one-dimensional oedometer consolidation test results over the range of 60kN/m^2 to 240kN/m^2.

4.1.6 Glaciofluvial Deposits

Glaciofluvial Deposits are present in the north of the site and generally consist of sand and gravelly sand, with subordinate content of silt and clay. In places, strata of sandy clay are present. Gravel is predominantly of ironstone, with sandstone and mudstone also appearing in places. Generally the sand is fine to coarse grained however in the vicinity of Northampton Road predominantly medium grained sand is present.

SPT N-values within the coarse units of these materials range from 5 to 33 but are generally within the range 15 to 25, showing them to be of medium relative density. Angles of shearing resistance based on these results range from 29° to 35° based on the correlation of Peck et al (1967). There is little apparent depth correlation with SPT within the Glaciofluvial Deposits. Natural moisture content within the sands ranges between 4.3% and 22%.

Where cohesive Glaciofluvial Deposits are present natural moisture content ranges between 16% and 37%. Modified plasticity indices range between 4% and 31% indicating clay of low and high plasticity and silt of high plasticity. Particle size distribution analyses indicate fines fractions of between 12% and 70%, sand fractions of between 30% and 85% and gravel fractions of between 0.1% and 34%.

4.1.7 Glacial Till

Glacial Till is present on the higher ground in the east of the site and at the western edge of the site adjacent to the A43 to the north of the former filling station. The Glacial Till consists of generally stiff, in places firm, slightly gravelly and gravelly clay with subordinate pockets and lenses of sand. Gravel is flint, mudstone, quartz, limestone and chalk. At two locations in the centre of the site, discrete deposits of stiff clay with gravel of chalk, flint and limestone were encountered either near surface or underlying Alluvium. The strength and constituents of these deposits suggests the soil is Glacial Till, specifically the Oadby Member, as is present in the east and west of the site, as opposed to Alluvium or the underlying Whitby Mudstone.

Undrained shear strength parameters of the cohesive units of these materials based on *in situ* and laboratory testing are presented in Table 4.3.

Table 4.3: Soil Strength Results and Derived Values for Glacial Till

SPT (N-Value) (Range)	Shear Strength (Range)	Method	No. of Results
	c_u (kPa)		
13 - 26	55 - 109	Correlation with Stroud (1975) based on 'average' plasticity	11
-	50 - 110	Hand shear vane	13

Approximate coefficients of volume compressibility (m_v) derived from the *in situ* SPT testing within the cohesive units of these materials range from 0.09 m^2/MN to 0.17 m^2/MN adopting an f_2 value of 0.45 (based on the 'average' plasticity).

Where sand beds are present within the Glacial Till, SPT 'N' values of 20 and 26 were recorded in a total of 2 tests. This corresponds to an angle of internal friction of between 33° and 35° based on Peck et al (1967).

4.1.8 Wellingborough Limestone Member

The Wellingborough Limestone Member is present at the extreme southeastern corner of the site only, with the outcrop making up the higher ground towards Roade Cutting. The deposit consisted of a thin, highly weathered near surface deposit of clayey sand with gravel of flint and shell fragments.

4.1.9 Rutland Formation

The Rutland Formation incorporates the Wellingborough Limestone and Stamford Member as subordinate units, for the purpose of this report strata described as the Rutland Formation are undifferentiated deposits in between named subordinate beds.

The Rutland Formation was encountered at one location and consists of stiff sandy clay interbedded with beds of fine sand. The Rutland Formation was proven to a depth of 1.40m.

4.1.10 Stamford Member

The Stamford Member was encountered in two trial excavations in the southeast corner of the site at the base of the Rutland Formation group, overlying the Northampton Sand. The Stamford Member consists of clayey sandy gravel of residual sandstone fragments, and stiff clay.

A single moisture content and Atterberg limits test on a sample of the clay indicated a natural moisture content of 26%, liquid limit of 50% and plastic limit of 22%. This indicates clay of intermediate to high plasticity. The granular material was found to contain 8% fines, 13% sand and 79% gravel.

4.1.11 Northampton Sand Formation

The Northampton Sand is present in the southeast of the site between the Rutland Formation and the lower ground characterised by the Whitby Mudstone that covers the majority of the development site. The Northampton Sand consists of gravelly sand with a medium cobble content and thin beds of clay. Gravel is sandstone and ironstone. The natural moisture content of a sample of the Northampton Sand was found to be 21%.

4.1.12 Whitby Mudstone Formation

Whitby Mudstone forms the upper beds of the solid geology over the majority of the site, with the exception of the lower ground in the northwest along the Milton Malsor Brook, and in the extreme northeast corner along the Eastern Arm of the Milton Malsor Brook. The Whitby Mudstone consists of stiff clay with increasing mudstone fragments and lithorelicts with depth. The clay is frequently closely and very closely fissured and contains fossil remains and gypsum crystals and occasionally flint gravel. In places, thin limestone, sandstone and sand beds are present in the Whitby Mudstone.

Particle size distribution analyses indicate fines fractions ranging between 43% and 95%, sand fractions of between 1.6% and 20.6% and gravel fractions of between 0.5% and 39%.

Undrained shear strength parameters of the cohesive units of these materials based on *in situ* and laboratory testing are presented in table 4.4.

Table 4.4: Soil Strength Results and Derived Values for Whitby Mudstone Formation

SPT (N-Value) (Range)	Shear Strength (Range) c_u (kPa)	Method	No. of Results
7 – 64 (average 34)	29 – 269 (average 132)	Correlation with Stroud (1975) based on 'average' plasticity	170
-	50 – 170 (average 100)	Hand shear vane	165
-	23 – 175 (average 102)	Laboratory triaxial test	28

A general increase in strength with depth trend is apparent in the results, albeit the trend is less pronounced with hand shear vane and laboratory triaxial data than with the SPT data. It may be appropriate to use SPT data corrected for the overburden depth in geotechnical designs. In the laboratory triaxial data, there is a clear inverse relationship between moisture content and shear strength. Plots showing the relationship between shear strength and depth or elevation are provided at Appendix C.

Approximate coefficients of volume compressibility (m_v) derived from the *in situ* SPT testing within the cohesive units of these materials range from 0.04 m^2/MN to 0.33 m^2/MN, averaging 0.09 m^2/MN adopting an f_2 value of 0.43 (based on the 'average' plasticity). Based on laboratory oedometer tests, coefficients of volume compressibility range between 0.09 m^2/MN to 0.25 m^2/MN over the pressure range of 60kN/m^2 to 240kN/m^2.

4.1.13 Marlstone Formation

The Marlstone Formation was encountered in boreholes in the west of the site and in a number of trial pits in the northwest and south adjacent to the Milton Malsor Brook where the deposit outcrops or is present at shallow depth. In the eastern side of the site the Marlstone outcrops in the northeast along the Eastern Arm of the Milton Malsor Brook, whereas elsewhere it is present at depth and therefore not encountered in the majority of the exploratory holes. In the east and southeast of the site, a limestone bed was encountered at 13.60m and 12.10m depth at two locations (BHR001 and BHR003) and it is tentatively concluded that this is the Marlstone Formation.

Where encountered the Marlstone Formation varied between 0.10m and 2.20m in thickness and was typically around 0.80m in thickness. The Marlstone is variable in nature and consists of intact limestone, gravel sized limestone fragments, fossiliferous limestone, multi-coloured mudstone and siltstone, and where weathered, sandy clay, gravel and sand. The Marlstone was frequently associated with a groundwater strike during the investigation.

SPT 'N' values in granular deposits of the Marlstone were greater than 50 in the majority of cases, with a minimum value of 25 recorded. In cohesive deposits, SPT 'N' values ranged between 6 (weathered near surface) and 50, typically being greater than 25, corresponding to an angle of internal friction of 34.5°. Overall the deposits are predominantly granular in nature or intact rock, therefore correlation with undrained shear strength is considered inappropriate. A single particle size distribution analysis was undertaken and indicates a fines content of 38%, sand content of 42% and gravel content of 20%. However, it is not possible to test the coarse material derived from the Marlstone in the laboratory.

4.1.14 Dyrham Formation

The Dyrham Formation is present from near surface in the northwest of the site only in the low land surrounding the Milton Malsor Brook. Deeper boreholes encountered the Dyrham Formation in the south of the site underlying the Whitby Mudstone and Marlstone Formation. The Dyrham Formation consists of stiff to hard clay, sandy clay and mudstone with some beds of compact silt and sand. Fossils and gypsum crystals are frequently present. Generally speaking,

the Dryham Formation is coarser in nature than the Whitby Mudstone with sand and silt size particles more prevalent. However, in many cases the Dyrham Formation consists of dark grey clay that is indistinguishable from the Whitby Mudstone.

Particle size distribution analyses of the Dyrham Formation indicate fines fractions ranging between 65% and 74%, sand fractions of between 8.9% and 26% and gravel fractions of between 1% and 7.4 %.

Undrained shear strength parameters of the cohesive units of these materials based on *in situ* and laboratory testing are presented in Table 4.5.

Table 4.5: Soil Strength Results and Derived Values for Dyrham Formation

SPT (N-Value) (Range)	Shear Strength (Range)	Method	No. of Results
	c_u (kPa)		
13 – 58 (average 40)	60 – 270 (average 180)	Correlation with Stroud (1975) based on 'average' plasticity	30
-	20 – 140 (average 90)	Hand shear vane	15
-	69 - 166	Laboratory triaxial test	5

Approximate coefficients of volume compressibility (m_v) derived from the *in situ* SPT testing within the cohesive units of these materials range from 0.03m^2/MN to 0.15m^2/MN, averaging 0.09m^2/MN adopting an f_2 value of 0.50 (based on the 'average' plasticity). Based on laboratory oedometer tests, coefficients of volume compressibility range between 0.18m^2/MN to 0.40 m^2/MN over the pressure range of 40kN/m^2 to 320kN/m^2. The oedometer test results for the Dyrham Formation appear higher than would be expected for such soil.

4.2 Obstructions

No impenetrable man-made obstructions were encountered during the investigation. Large boulders are present in the Made Ground both the landfill and Roade Cutting areas. All cable percussion boreholes were continued to refusal of the boring technique deployed in the investigation. Trial pits were frequently terminated due to strata becoming impenetrable for the plant used (JCB 3CX backhoe), or because progress was sufficiently slow to make further excavation impractical.

Obstructions are present on site including buildings and existing or redundant infrastructure.

4.3 Visual and Olfactory Evidence of Contamination

Visual and olfactory evidence of contamination, in addition to the more common man-made constituents described above, was noted in a number of trial pits and boreholes and is summarised in Table 4.6, with this information presented on the Site Zonation Plan in Appendix A.

Table 4.6: Visual and Olfactory Evidence of Contamination

Exploratory Hole	Depth	Description	Stratum
WSLF002	0.00 – 0.60	Very slight chemical odour	Made Ground (Lodge Farm)
WSLF004	0.30 – 0.90	Very strong creosote odour	Made Ground (Lodge Farm)
WSLF005	0.30	2 no. fragments of asbestos cement sheeting	Made Ground (Lodge Farm)
TPL010	2.70	Odour of creosote	Made Ground (Landfill)
WSBL06	3.00	Asbestos Containing Material	Made Ground (Rathvilly Farm pit)

4.4 Other Geotechnical Parameters

4.4.1 Effective Stress Parameters

Effective stress parameters for soils on site are summarised in Table 4.7.

Table 4.7: Effective stress parameters from laboratory testing

Stratum	Method	No. Tests	c' (kN/m²)	ϕ' (°)
Alluvium	Consolidated undrained (3xU38)	1	0	44
Glaciofluvial Deposits	300mm shear box	2	22 – 28	12 – 29
Whitby Mudstone	Consolidated undrained (3xU38)	1	19	23
	60mm shear box	1	25 (peak)	22 (peak)
			4.6 (residual)	13 (residual)
Weathered Marlstone Formation (cohesive)	Consolidated undrained (multistage U100)	1	13	36
Dyrham Formation	Consolidated undrained (3xU38)	1	8.0	33

4.4.2 Compaction Characteristics

The compaction characteristics for soils are summarised in Table 4.8.

Table 4.8: Compaction characteristics from laboratory testing

Stratum	Number of Tests	B.S. Compaction Test (kg rammer)	Natural Moisture Content (%) Range	Optimum Moisture Content (%) Range	Maximum Dry Density (Mg/m^3) Range
Made Ground (landfill)	2	4.5	7.6 - 28	14 - 15	1.80 – 1.86
Made Ground (Roade Cutting)	1	2.5	32	22	1.59
Made Ground (General, clay fill on floodplain)	1	4.5	41	31	1.41
Alluvium	2	2.5	16 – 49 (excluding organic soils)	20 - 22	1.41 – 1.57
	1	4.5		13	2.05
Glaciofluvial Deposits	3	4.5	4.3 – 22	9.5 - 15	1.73 – 1.90
Glaciofluvial Deposits (cohesive)	1	2.5	18 - 37	24	1.56
Glacial Till	1	4.5	17 - 26	16	1.79
Northampton Sand	1	2.5	21	21	1.68
Whitby Mudstone	4	2.5	17 - 43	11 - 26	1.48 – 1.82
	9	4.5		12 - 24	1.52 – 1.88
Weathered Marlstone Formation	2	4.5	14 - 23	12	1.87 – 1.89
Dyrham Formation	2	2.5	7.6 - 30	14 - 24	1.54 – 1.64
	3	4.5		10 - 18	1.81 – 2.00

4.4.3 California Bearing Ratio (CBR)

The CBR results are summarised in Table 4.9 including recommended values that can be assumed for preliminary design purposes within the scope of this report. All tests were undertaken in the laboratory on remoulded samples at natural moisture content.

Table 4.9: CBR Results

Stratum	No. Tests	CBR (%) (Range)
Made Ground (landfill)	1	37
Made Ground (Roade Cutting)	1	16
Alluvium (clay)	1	0.8 – 1.4

Stratum	No. Tests	CBR (%) (Range)
Alluvium (sand and gravel)	3	3.2 – 14
Glaciofluvial Deposits (sand)	1	14 - 18
Glaciofluvial Deposits (clay)	1	1.5 – 1.8
Glacial Till	1	8.9
Whitby Mudstone	6	7.6 - 16
Marlstone (sand)	1	3.5
Dyrham Formation	2	3.5 – 5.4

4.4.4 Sulphate Content

Gypsum crystals are present throughout the Whitby Mudstone and Dryham Formation, typically sand sized but up to medium gravel sized in places.

In accordance with BRE (Special Digest 1), the Design Sulphate (DS) classification and the Aggressive Chemical Environment for Concrete (ACEC) classification are presented in Table 4.10.

Table 4.10: Aggressive Chemical Environment Concrete Classification

Stratum	No. Tests	DS	ACEC
Made Ground (landfill)	3	DS-2	AC-2
Made Ground (Roade Cutting)	3	DS-4	AC-4
Made Ground (General)	2	DS-1	AC-1
Alluvium	9	DS-3	AC-3
Glaciofluvial Deposits	6	DS-1	AC-1
Glacial Till	1	DS-1	AC-1
Whitby Mudstone	20	DS-4	AC-4
Marlstone	3	DS-1	AC-1
Dyrham Formation	6	DS-4	AC-4
Groundwater	31	DS-3	AC-3

4.5 Groundwater

Groundwater strikes encountered during the investigation and subsequent monitoring are summarised in Table 4.11. Cross sections indicating the groundwater levels at the proposed development platforms between January and February 2017 are provided on drawing 151171/D008 at Appendix A.

Table 4.11: Groundwater Data

Stratum	Date Range	Exploratory Hole	Fieldwork		Post-Fieldwork Monitoring	
			Depth Groundwater Encountered (Rose to after 20 mins) (m bgl)	Groundwater Elevation (Reduced Level) (mOD)	Depth to Groundwater (Range) (m bgl)	Groundwater Elevation (Reduced Level) (Range) (mOD)
Made Ground (landfill)	17/11/16 – 28/06/17	BHL007	Not encountered	n/a	1.40 - 1.91	76.96 - 77.40
Made Ground (landfill)	21/04/17 – 28/06/17	BHL008	In Whitby Mudstone	-	2.45 – 3.63	79.24 – 80.42
Made Ground (Roade Cutting)	13/10/16 - 27/06/17	BHG001	In Whitby Mudstone	-	1.74 - 2.45	95.35 - 96.14
Made Ground (Roade Cutting)	13/10/16 - 27/06/17	BHR003	Not encountered	n/a	0.05 - 0.51	96.56 - 97.42
Made Ground (Roade Cutting)	30/08/2016	TPT021	2.1	95.56	n/a	n/a
Made Ground	17/11/16 – 28/06/17	BHL002	Not encountered	n/a	0.70 - 0.95	74.52 - 74.95
Made Ground	17/11/16 - 28/06/17	BHL003	Not encountered	n/a	0.66 - 0.94	77.45 - 77.73
Made Ground / Whitby Mudstone	21/11/16 – 23/06/17	WSS01	Not encountered	n/a	1.79 – 2.11	78.24 - 81.26
Made Ground / Whitby Mudstone	21/11/16 – 23/06/17	WSS06	Not encountered	n/a	0.79 - 1.63	78.61 - 81.42
Alluvium	14/10/16 - 28/06/17	BHA003	In Whitby Mudstone	-	1.14 - 1.52	76.56 - 76.94
Alluvium	14/10/16 - 28/06/17	BHA005	1.5	76.71	0.11 – 1.24	76.97 - 78.10
Alluvium	17/11/16 - 28/06/17	BHA010	Not encountered	n/a	0.45 – 1.09	76.31 - 76.95
Alluvium	17/11/16 – 28/06/17	BHA013	Not encountered	n/a	0.58 - 1.62	74.28 - 75.32
Alluvium	17/11/16 – 28/06/17	BHA015	In Dyrham Formation	-	0.05 - 0.44	73.12 - 73.51
Alluvium	13/10/16 – 10/05/17	BHG017	Not encountered	n/a	0.34 - 0.77	77.23 - 77.61
Alluvium	23/08/2016	TPA010	1.5	78.74	n/a	n/a
Alluvium	14/09/2016	TPA015	2.4	74.6	n/a	n/a
Alluvium	07/09/2016	TPA025	1.6	72.51	n/a	n/a

Stratum	Date Range	Exploratory Hole	Fieldwork		Post-Fieldwork Monitoring	
			Depth Groundwater Encountered (Rose to after 20 mins) (m bgl)	Groundwater Elevation (Reduced Level) (mOD)	Depth to Groundwater (Range) (m bgl)	Groundwater Elevation (Reduced Level) (Range) (mOD)
Alluvium	07/09/2016	TPA028	1.9	72.25	n/a	n/a
Alluvium	27/09/2016	TPG037	1.7	76.8	n/a	n/a
Alluvium / Whitby Mudstone	14/10/16 – 28/06/17	BHA004	In Whitby Mudstone	-	0.46 - 1.43	76.69 - 77.66
Alluvium / Whitby Mudstone	14/10/16 - 28/06/17	BHRT01	In Marlstone	-	1.32 - 3.40	80.40 - 82.48
Glaciofluvial Deposits	13/10/16 - 10/05/17	BHG009	Not encountered	n/a	4.94 - 5.06	79.14 - 79.26
Glaciofluvial Deposits	04/10/2016	BHG016	3	77.85	n/a	n/a
Glaciofluvial Deposits	13/10/16 - 10/05/17	BHG016	As above	As above	2.08 - 3.11	77.76 – 78.77
Glaciofluvial Deposits	30/01/17 – 28/06/17	BHG024	Not encountered	-	2.24 – 3.23	84.93 – 85.92 (previously in Whitby Mudstone)
Glaciofluvial Deposits	17/11/16 – 28/06/17	BHL010	Not encountered	n/a	2.48 - 2.60	77.08 - 77.20
Glaciofluvial Deposits	06/06/17	WSBL04	2.50	79.50	n/a	n/a
Glaciofluvial Deposits	12/09/2016	TPG035	3.2	77.82	n/a	n/a
Glacial Till	26/08/2016	BHR001s	2.4	88.25	As below	As below
Glacial Till	13/10/16 – 27/06/17	BHR001s	As above	As above	1.90 - 2.32	88.33 - 88.75
Whitby Mudstone	01/09/2016	BHA001	2	77.7	As below	As below
Whitby Mudstone	14/10/16 – 28/06/17	BHA001	As above	As above	1.29 - 2.57	77.13 - 78.41
Whitby Mudstone	14/10/16 – 28/06/17	BHA002	Not encountered	n/a	0.31 - 2.19	77.73 - 79.61
Whitby Mudstone	23/09/2016	BHA003	2.6	75.48	In Alluvium	-
Whitby Mudstone	23/09/2016	BHA003	1.5	76.58	In Alluvium	-

Stratum	Date Range	Exploratory Hole	Fieldwork		Post-Fieldwork Monitoring	
			Depth Groundwater Encountered (Rose to after 20 mins) (m bgl)	Groundwater Elevation (Reduced Level) (mOD)	Depth to Groundwater (Range) (m bgl)	Groundwater Elevation (Reduced Level) (Range) (mOD)
Whitby Mudstone	24/08/2016	BHA004	2.45	75.67	In Alluvium / Whitby Mudstone	-
Whitby Mudstone	30/08/2016	BHG001	2.1	95.7	-	-
Whitby Mudstone	30/08/2016	BHG001	6.1	91.7	In Made Ground	-
Whitby Mudstone	06/10/2016	BHG002	8	85.5	No standpipe installed	-
Whitby Mudstone	13/10/16 – 28/06/17	BHG003	Not encountered	n/a	0.30 - 9.06	75.34 – 84.10
Whitby Mudstone	17/11/16 - 28/06/17	BHG005	In Marlstone	n/a	3.22 - 3.50	79.62 - 79.90
Whitby Mudstone	13/10/16 - 27/06/17	BHG006	Not encountered	n/a	0.93 - 8.78	80.82 - 88.67
Whitby Mudstone	13/10/16 – 27/06/17	BHG007	Not encountered	n/a	0.20 - 6.17	77.47 - 83.44
Whitby Mudstone	17/11/16 – 10/05/17	BHG010	Not encountered	n/a	0.76 - 1.55	83.56 - 84.35
Whitby Mudstone	22/08/2016	BHG011	2.7	80.37	No standpipe installed	-
Whitby Mudstone	13/10/16 – 27/06/17	BHG014	Not encountered	n/a	1.54 - 7.46	82.96 - 88.88
Whitby Mudstone	13/10/16 – 27/06/17	BHG015	Not encountered	n/a	3.00 - 7.93	65.64 - 70.57
Whitby Mudstone	13/10/16 – 10/05/17	BHG019	Not encountered	n/a	2.54 - 3.08	74.82 - 75.16
Whitby Mudstone	13/10/16 – 28/06/17	BHG024	Not encountered	n/a	7.36 - 10.23	77.93 - 80.80
Whitby Mudstone	17/11/16 – 28/06/17	BHL001	Not encountered	n/a	3.71 - 4.29	74.79 – 75.37
Whitby Mudstone	06/09/2016	BHL003	1	77.39	In Made Ground	-
Whitby Mudstone	08/09/2016	BHL008	5	77.87	Dry	-
Whitby Mudstone	08/09/2016	BHL009	5.5	78.27	See below	-
Whitby Mudstone	17/11/16 – 28/06/17	BHL009	See Above	-	6.04 - 6.44	77.33 - 77.73

Stratum	Date Range	Exploratory Hole	Fieldwork		Post-Fieldwork Monitoring	
			Depth Groundwater Encountered (Rose to after 20 mins) (m bgl)	Groundwater Elevation (Reduced Level) (mOD)	Depth to Groundwater (Range) (m bgl)	Groundwater Elevation (Reduced Level) (Range) (mOD)
Whitby Mudstone	13/10/16 – 27/06/17	BHR001d	In Glacial Till	-	6.51 - 7.16	83.49 – 84.14
Whitby Mudstone	13/10/16 – 27/06/17	BHR004	Not encountered	-	0.41 - 2.29	87.60 - 89.48
Whitby Mudstone	21/11/16 – 23/06/17	BHRB02	In Marlstone	-	2.59 - 2.94	80.86 - 81.21
Whitby Mudstone	13/10/16 – 10/05/17	BHRT02	Not encountered	-	0.08 - 5.57	78.23 - 83.72
Whitby Mudstone	14/09/2016	TPA026	2.8	73.21	n/a	n/a
Whitby Mudstone	13/09/2016	TPG034	2.95	81.13	n/a	n/a
Whitby Mudstone	31/08/2016	TPR008	1.8	95.14	n/a	n/a
Whitby Mudstone	21/11/16 - 23/06/17	WSS04	Not encountered	n/a	1.29 - 1.44	78.92 - 82.39
Whitby Mudstone	21/11/16 - 23/06/17	WSS08	Not encountered	n/a	1.20 - 1.63	78.84 - 82.23
Marlstone Formation	25/08/2016	BHA005	1.8	76.41	In Alluvium	-
Marlstone Formation	25/08/2016	BHG005	5.1	78.02	In Whitby Mudstone	-
Marlstone Formation	22/08/2016	BHG011	5.5	77.57	No standpipe installed	-
Marlstone Formation	06/09/2016	BHG012	2.25	76.53	As below	-
Marlstone Formation	17/11/16 – 28/06/17	BHG012	As above		0.74 - 1.68	77.10 - 78.04
Marlstone Formation	04/10/2016	BHG016	5	75.85	In Glaciofluvial Deposits	-
Marlstone Formation	10/10/2016	BHRB02	3.5	80.3	In Whitby Mudstone	-
Marlstone Formation	25/08/2016	BHRT01	5.3	74.66	In Alluvium / Whitby Mudstone	-
Marlstone Formation	06/09/2016	TPA003	2.85	77.31	n/a	n/a
Marlstone Formation	14/09/2016	TPA029	1.5	72.77	n/a	n/a

Stratum	Date Range	Exploratory Hole	Fieldwork		Post-Fieldwork Monitoring	
			Depth Groundwater Encountered (Rose to after 20 mins) (m bgl)	Groundwater Elevation (Reduced Level) (mOD)	Depth to Groundwater (Range) (m bgl)	Groundwater Elevation (Reduced Level) (Range) (mOD)
Marlstone Formation	15/09/2016	TPA032	1.45	76.1	n/a	n/a
Marlstone Formation	16/09/2016	TPA049	2.1	78.14	n/a	n/a
Marlstone Formation	05/09/2016	TPG052	2.85	76.54	n/a	n/a
Marlstone Formation	05/09/2016	TPG052	2.85	76.54	n/a	n/a
Marlstone Formation	25/08/2016	TPG063	2.9	75.44	n/a	n/a
Dyrham Formation	01/09/2016	BHA001	3.2	76.5	In Whitby Mudstone	-
Dyrham Formation	24/08/2016	BHA004	1.67	76.45	In Alluvium / Whitby Mudstone	-
Dyrham Formation	12/09/2016	BHA015	1.5	72.06	In Alluvium	-
Dyrham Formation	07/09/2016	BHL002	1.9	73.8	In Made Ground	-
Dyrham Formation	15/09/2016	TPA033	3.4	74.62	n/a	n/a

4.5.1 Infiltration Tests

The results of the infiltration testing undertaken are summarised in Table 4.12. The results sheets are presented in Appendix B. All testing was carried out in accordance with Hydrock's 1-day assessment methodology. This is in general accordance with BRE Digest 365 (BRE 2007) where infiltration rates allow three test runs during a working day (or where there is no infiltration), but where low infiltration rates were encountered the available time may not have been sufficient to fully comply with the BRE test method.

Where fewer than three tests were possible in a particular location the results provided should be considered indicative only and should not be used for design purposes. Further discussion concerning the suitability of infiltration testing at the site is provided in Section 6.7.

Table 4.12: Infiltration Test Results

Stratum	Trial Pit no.	Depth	Infiltration Rate (m/s)			Notes
			Test 1	Test 2	Test 3	
Glaciofluvial Deposits	TPA023	1.70	n/a	-	-	-
Glaciofluvial Deposits	TPA027	2.00	n/a	-	-	75% of initial volume reached (25% empty)
Glaciofluvial Deposits	TPG029	2.10	n/a	-	-	-
Glaciofluvial Deposits	TPG030	1.90	n/a	-	-	-
Glaciofluvial Deposits	TPG038	2.20	n/a	-	-	50% of initial volume reached
Glaciofluvial Deposits	TPG039	2.10	n/a	-	-	Terminated due to instability of pit
Glaciofluvial Deposits	TPG040	2.20	n/a	n/a	-	50% of initial volume reached, pit refilled
Glaciofluvial Deposits / Whitby Mudstone	TPG065	1.80	n/a	-	-	-
Whitby Mudstone Formation	TPA019	2.80	n/a	-	-	-
Whitby Mudstone Formation	TPA032	2.00	n/a	-	-	-
Whitby Mudstone Formation	TPG061	2.10	n/a	-	-	-

4.6 Geo-Environmental Results

The chemical test results for soil, leachate and groundwater are given in Appendix F, which also includes summary tables of the data.

Concentrations of metals and PAH species above the limit of detection and background concentrations were found in the Landfill soils, soils at Lodge Farm, 'general' Made Ground associated with farming and soils at the service station.

Asbestos was detected at two locations at Lodge Farm, including the farmyard itself and an area of hardcore at the Northampton Loop underbridge. Asbestos was detected at three locations within Rathvilly Farm pit.

Petroleum hydrocarbons were detected at low concentrations at the former filling station, the Northampton Loop underbridge at Lodge Farm and, in one instance, within topsoil in the fields in the northeast of the site. Significant concentrations of petroleum hydrocarbons were found at one location in Lodge Farm, and in one topsoil sample in the vicinity of the leak at the Grand Union Canal.

Concentrations of the following determinands were not reported above the laboratory limit of detection.

- Soils – cyanide and phenol.
- Waters and leachates – hexavalent chromium and free cyanide.

4.7 Ground Gases (Carbon Dioxide and Methane)

Gas monitoring standpipes have been monitored on eight occasions to date between October 2016 and June 2017. Records from the gas monitoring boreholes are presented in Appendix D and summarised in Table 4.13.

Table 4.13: Range of Ground Gas Data

Area (conceptual gas risk)	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Flow Rate (l/hr)
Landfill	<0.1	0.1 – 2.9	5.5 – 20.9	<0.1
Rathvilly Farm pit	<0.1 – 26.5	1.9 – 5.9	0.1 – 16.7	<0.1
Other	<0.1	0.1 – 3.8	2.3 – 20.9	<0.1 – 4.4

4.8 Updated Ground Model

The preliminary conceptual site model initially developed from the Desk Study has been updated using the findings of the ground investigation.

The main features of the site are summarised on the Site Zonation Plan (Appendix A).

Subsequent to the ground model described in the Desk Study and summarised in Section 2.0, the ground investigation has confirmed ground conditions below the site to comprise:

- Topsoil over the majority of the site consisting predominantly of clay and sandy clay;
- Variable Made Ground comprising:
    - Landfill Made Ground in the northwest of the site extending to a proven depth of 7.50m (and possibly deeper based on topographic levels) and consisting of variable gravelly clay and gravelly sand, with cobbles and boulders and locally organic material;
    - Made Ground derived from arisings from Roade Cutting in the southeast of the site consisting of clay with cobbles and boulders of limestone and proven to be greater than 3.00m thick in places;
    - Made Ground at Rathvilly Farm pit consisting predominantly of soft sandy gravelly clay, with some deposits of clayey gravelly sand and fine gravel of ash and with cobbles and boulders. Asbestos containing materials are also present. The Made Ground at Rathvilly Farm extends to a depth of up to at least 4.50m, and may possibly be deeper in places.
    - Made Ground consisting of imported aggregates and reworked natural clay at the former filling station, proven to be up to 1.70m in thickness;
    - Made Ground consisting of variable clay, sand and gravel present to a depth of up to 1.30m at Lodge Farm. The Made Ground at Lodge Farm includes ash and clinker and cobble size particles of demolition type material;
    - Made Ground consisting of sandy gravelly clay with cobbles placed to form the embankment of the Grand Union Canal, proven to up to 1.70m thickness;
    - Other discrete areas of Made Ground associated with agriculture proven to be up to 1.25m thick and consisting of variable sand, gravel and clay with man-made inclusions.
- Variable superficial deposits comprising:
    - Alluvium located through the centre of the site around the Milton Malsor Brook and consisting of clay and sandy clay. Locally there is a basal bed of sand and gravel present across the low lying ground in the south of the site. The Alluvium is typically 2.50m thick in the south of the site. In the north of the site, the Alluvium includes deposits of clay, silt, organic clay and sand and has been proven to a maximum thickness of 3.00m.

  - Glaciofluvial Deposits are present in the north of the site and consist of sand and gravelly sand with a variable fines content and occasional beds of sandy clay. The Glaciofluvial Deposits are greater than 10m thick in the north of the site.

  - Glacial Till is present along the eastern edge of the site and in the northwest corner. The Glacial Till consists of slightly sandy slightly gravelly and gravelly clay with gravel of flint, limestone, chalk and mudstone. The Till has been proven to a maximum depth of 3.20m in the vicinity of Lodge Farm.

- Whitby Mudstone is present under the majority of the site and consists of stiff fissured clay with mudstone lithorelicts and fragments, along with fossils and frequent crystals of gypsum.

- The Marlstone Rock Formation is present underlying the Whitby Mudstone and outcrops approximately as anticipated by the Desk Study. The Marlstone Rock consists of limestone with ironstone gravel and fossils, and is places is weathered to sand and gravel. A maximum thickness of 2.00m thickness was encountered. However, it is mostly less than 1.00m in thickness.

- The Dyrham Formation is present underlying the Marlstone and outcrops in the northwest of the site. The Dyrham Formation consists of stiff clay, sandy clay with relict rock fragments and gypsum crystals.

Groundwater is present underlying the site, with a general northward flow direction prevalent. Groundwater is present within all the geological units on site depending on their elevation. However, within the Whitby Mudstone groundwater is generally found towards the base and may in places be confined within the underlying Marlstone. Locally, in some areas of Made Ground and in the Glacial Till in the east, a perched water table is present within the superficial deposits. The groundwater is in continuity with the Milton Malsor Brook.

The investigation has identified potential sources of contamination consisting of metals, PAH asbestos and petroleum hydrocarbons. The main area of concern is Lodge Farm, and to a lesser extent the landfill and former filling station. The investigation works have not encountered ground gas at significant concentrations at the landfill in the northwest of the site. At Rathvilly Farm pit, methane has been detected at high concentrations (>25%) at one borehole. As the borehole installation at Rathvilly Farm was undertaken at a later stage in the investigation (June 2017) the data to date includes only a single monitoring visit.

5.0 GEO-ENVIRONMENTAL ASSESSMENT

5.1 Approach

A number of generic risk assessments are undertaken in accordance with the principles of CLR 11 (Environment Agency 2004) using the CSM that has been updated following the ground investigation. Firstly, the risks associated with the identified potential contaminant linkages are estimated using standardised methods (typically involving comparison of site data with published 'screening values'. Secondly, where screening values are exceeded, the risks are evaluated in an authoritative review of the findings with other pertinent information to determine if exceedance may be acceptable in the particular circumstances. For details please refer to Appendix E.

The data sets used comprise the appropriate analytical results obtained by Hydrock and listed in Section 3.5. In cases where unacceptable risks are indicated, mitigation measures such as more advanced stages of risk assessment or remediation will be proposed in Section 6.0.

5.2 Updated Exposure Model

Following the site investigation, the plausible contaminant sources, receptors and pathways identified in the Desk Study have been updated or confirmed as follows.

5.2.1 Sources

Rathvilly Farm pit has been added as a potential source of contamination including metals, metalloids, PAH, petroleum hydrocarbons, asbestos and ground gases.

The following potential sources have been removed from the exposure model.

- A total of 24 combined pesticide and herbicide screens were undertaken in samples of the topsoil. No pesticide or herbicide compounds were detected in any sample.
- There is no evidence of contamination sourced from the transport yard off-site to the northwest.
- There is no evidence of contamination sourced from the railway.
- There is no evidence of contamination sourced from the trading estate off-site to the south (including food recycling and workshop, and formerly an abattoir and sewage works).

5.2.2 Receptors

No potential receptors have been removed from, or added to, the exposure model.

5.2.3 Pathways

No pathways have been removed from, or added to, the exposure model.

With reference to the updated ground model and updated exposure model reported above, generic risk assessment is undertaken in Section 5.0. Geotechnical recommendations made in Section 6.0.

5.3 Human Health Risk Assessment

This is a Tier 2 assessment using soil screening values for the CLEA land use scenario commercial /industrial.

The soil screening values used are generic assessment criteria (GAC) and results are given in Appendix E. Note that the Category 4 Screening Levels (C4SL) for lead have been used as there are no recognised GACs and the use of the term 'GAC' in this report includes these.

Statistical testing is used where data sets are suitable. For data sets with low sample numbers and/or a non-random spatial distribution (e.g. where sampling is targeted at specific areas) individual sample test results are compared directly with the screening values.

It should be noted that the phrase 'further assessment required' is used to denote soil concentrations that are equal to, or exceed, a GAC. This does not necessarily mean that the soil is 'contaminated' or not fit for use.

5.3.1 Risk Estimation (Including Statistical Testing)

The 'averaging areas' used in this report are based on the conceptual model and the proposed development and are summarised as:

- Topsoil;
- Natural soils (subsoils excluding topsoil);
- Landfill area;
- Roade Cutting Made Ground;
- Rathvilly Farm pit; and
- Filling station area.

The data set for each chemical determinand has been assessed for the presence of potential outliers (based on the conceptual model). No outliers have been removed.

In line with the guidance provided by the CIEH (May 2008) the 95th upper confidence level on the true mean (US_{95}) has been calculated from the sample data. Data have been assessed using the one-sample t-test or the one-sided Chebychev Theorem, as appropriate to the distribution and number of samples. There are no substances for which the US_{95} exceeds the GAC and it is concluded that no further assessment is required.

5.3.2 Risk Estimation (Without Statistical Testing)

Hydrock Default List of Determinands

The various areas of Made Ground associated with farming on the site are discrete in nature and therefore do not constitute a single dataset for the purpose of human health risk assessment. As such, direct comparison of measured contaminant concentrations has been made against the GAC as an indication of the likely risk posed by the agricultural Made Ground sources. Further works will be necessary to provide a definitive assessment of the risk posed by these soils.

Based on the comparison, there is one data point (WSLF004 at 0.20m) that exceeds the commercial / industrial GAC for benzo(a)pyrene (21 mg/kg concentration compared to the GAC of 14 mg/kg).

Asbestos

Asbestos was found at two locations at Lodge Farm (at the farm itself and near the railway underbridge) and 3 locations at Rathvilly Farm:

- At Lodge Farm, fragments of asbestos cement sheeting were found in WSLF004 at 0.20m.
- At the Northampton Loop line underbridge to the northeast of Lodge Farm, free chrysotile fibres were found (TPT028 at 0.30m).
- At Rathvilly Farm, chrysotile loose fibres were found in samples from boreholes WSBL09 and WSBL10 at 2.20m and 1.50m respectively. In one borehole (WSBL06), a fragment of amosite insulation board was found at 3.00m.

Petroleum Hydrocarbons (PHC)

Petroleum hydrocarbons were detected in a number of samples, above the detection limit of the analytical apparatus in 10 samples:

- Level 1 TPH tests in the filling station area identified relatively low concentrations in the carbon range 12 to 40 in two samples (WSS01 at 0.30m and WSS04 at 0.35m). These concentrations are all below the GAC.
- In the filling station area, aliphatic and aromatic hydrocarbons in the C12 to C44 were detected at two locations in Level 2 (speciated) tests (WSS02 at 0.40m and WSS03 at 1.20m) in the Made Ground and at the top of the Whitby Mudstone respectively. In both cases concentrations are below the corresponding GACs for the given fraction in the commercial / industrial land use scenario.
- In the landfill, level 1 TPH testing detected petroleum hydrocarbons in one sample (TPL010 at 0.15m) in the range of C21 to C44. The detected concentrations are all below the corresponding GAC.
- At Rathvilly Farm pit, petroleum hydrocarbons were detected in a total of 9 samples at concentrations of between 17 mg/kg and 450 mg/kg (total). Level 2 analyses indicated detection in carbon fractions from C12 to C44 in both aliphatic and aromatic fractions. In one instance (WSBL08 at 2.50m), the GAC for commercial end use was exceeded in the aromatic carbon fraction C16 to C21. All other sample concentrations were below the GAC for the corresponding carbon fraction for both aliphatic and aromatic compounds.
- At Lodge Farm, petroleum hydrocarbons were detected at two locations, one (WSLF004) within the farmyard and one (TPT027) within the Made Ground at the Northampton Loop Line underbridge.

- In the farmyard, aliphatic and aromatic petroleum hydrocarbons were detected in the Made Ground in the carbon ranges C10 to C44. The concentration of aromatic hydrocarbons in the range C16 to C44 exceed the corresponding GACs for commercial / industrial land use. At the bridge, aliphatic hydrocarbons were detected in the range C16 to C44 at concentrations below the appropriate GACs.

- At one location in the northwest of the site (TPT004 at 0.30m), aliphatic and aromatic petroleum hydrocarbons were detected in the topsoil in the carbon range C12 to C44. The detected concentrations were all below the corresponding GACs. The source of the petroleum hydrocarbons at this location is not clear. The area had previously been identified as a potential source of contamination due to the presence of a nearby IBC tank. However, it has since been established that the IBC is used to store water for an adjacent pheasant enclosure. There is no specific evidence of any other sources of petroleum hydrocarbons at this location, other than continued use by agricultural vehicles.

- In the southwest of the site, petroleum hydrocarbons were detected in one of the four shallow soil samples undertaken where water leaking from the Grand Union Canal flows over land. Aliphatic hydrocarbons were detected in the carbon range 10 to 35, with no aromatic hydrocarbons detected. The concentration in the range C12 to C16 exceeds the GAC for a commercial/industrial land use. Detection of aliphatic hydrocarbons in the carbon range C10 to C35, with no corresponding aromatic compounds, may indicate the presence of weathered kerosene. However, this field is also used annually for motocross racing so there are potentially other sources of petroleum hydrocarbons.

Volatile Organic Substances (VOC)

No VOCs were detected during the investigation.

A number of Semi-Volatile Organic Compounds (SVOC) were detected in a single sample from Lodge Farm (WSLF004 at 0.20m). Detected substances consisted of a number of Polycyclic Aromatic Hydrocarbons (PAH) as well as some Hetrocyclic Aromatic Hydrocarbons (carbazole, dibenzofuran and anthraquinone). A number of PAH compounds are included within the CLEA risk assessment, which indicates that the GAC for benzo(a)pyrene is exceeded at this location. No GAC for Hetrocyclic Aromatic Hydrocarbons has been published.

Based on the limited dataset available for Lodge Farm, formulation of a definitive risk assessment is considered not to be appropriate at this stage. It is therefore recommended that further investigation is undertaken to fully characterise the soil chemistry at Lodge Farm prior to developing a risk assessment and remediation strategy.

5.3.3 Risk Evaluation

The investigation has not identified any pervasive contamination within the datasets developed from the investigation. However, the following locations should be considered as contaminated and will require further investigation to allow design.

At Lodge Farm, petroleum hydrocarbon and PAH contamination has been identified, and asbestos has been found within the soils in the form of free fibres and bound material. The current investigation works at Lodge Farm was limited by the continued operation of the farm.

It is recommended that a more detailed investigation is undertaken in this area of the site prior to detailed design. At this stage it is anticipated that remediation in the form of excavation of the Made Ground and materials management, with the excavated made ground re-used at depth in the landscape bunds be undertaken at this location.

At the former filling station, petroleum hydrocarbons have been identified at a number of locations. Whilst the concentrations are generally low in comparison to GACs, it is anticipated that further contamination is likely to be present in the immediate surround of the former tanks. It is recommended that further works is undertaken post-demolition in the former filling station area, albeit it is not anticipated that gross contamination is present. Any gross contamination would require remediation in the form of bio-remediation and materials management. At this

Asbestos and petroleum hydrocarbons have been identified at Rathvilly Farm pit. Under current development proposals, this area of the site is to form part of the landscape zone and consequently, there is no requirement to excavate the materials and therefore no pathway for pollutant linkages for human health receptors. However, to prevent any potential risks for site users who may potentially walk across the site, Hydrock would recommend the installation =of 450mm of clean subsoil and topsoil as part of the re-profiling works. Risk to groundwater is discussed in Section 5.5.

There is some evidence to suggest the fuel leak at the Grand Union Canal may have had an impact on the field immediately to the north. Whilst this is tentative and it is likely that any contamination would be naturally attenuated, it may be necessary to undertake further sampling in this area of the site to demonstrate that no risk is posed. At this stage it is anticipated that remediation in the form of materials management be undertaken at this location.

5.4 Plant Life Risk Assessment

5.4.1 Risk Estimation

Priority phytotoxic chemical concentrations have screened against published values to determine the likely risk to plant growth and the findings presented in Appendix F.

As with human health, statistical testing is used where data sets are suitable, otherwise individual sample test results are compared directly with the screening values.

Based on a US_{95} exceedance of the GAC, or in the case of the Farm Areas, exceedance of maximum concentrations by direct comparison, the pervasive chemicals of potential concern which require further assessment are summarised in Table 5.1

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Table 5.1: Pervasive Chemicals of Potential Concern for Which Further Assessment is Required (Risk to Plants)

Chemical of Potential Concern	Generic Criterion (mg/kg)	Basis for Generic Criterion	No. Samples	Min. (mg/kg)	Max. (mg/kg)	US_{95} (mg/kg)	No. Samples Exceeding Generic Acceptable Criterion
Natural Subsoils (undifferentiated)							
Boron	3	New Zealand timber 1997	15	0.4	5.6	3.50	2
Made Ground (Roade Cutting)							
Boron	3	New Zealand timber 1997	19	0.6	6.1	4.08	5
Made Ground (Rathvilly Farm pit)							
Boron	3	New Zealand timber 1997	21	0.4	4.2	3.12	5
Made Ground (Farm Areas)							
Boron	3	New Zealand timber 1997	9	0.9	3.8 – 5.1	n/a	2
Copper	135	BS3882 2015	9	4.3	180	n/a	1

5.4.2 Risk Evaluation

The solid geology of the site and the adjacent geology (Blisworth Limestone) which is in effect upstream in terms of groundwater flow, is abundant in marine evaporates including gypsum and carbonate rocks. Referring to the section below, the groundwater in the area has been found to be high in concentrations of salt, suggesting halite has been formed within the deposits in addition to gypsum. Boron containing minerals commonly occur in brine associated with the formation of solid evaporates. In the absence of any anthropological source of boron, it is likely that the boron identified on site is present as a result of natural geological processes. As such, no unacceptable risk to plant life is perceived in relation to boron.

The assessment for the farm areas includes discrete data points and therefore no statistics has been undertaken. The location at which copper was detected at concentrations in excess of BS 3882 (TPT027) is at the Made Ground at the railway underbridge at Lodge Farm. The farm area is effectively a contamination hot spot and the additional investigation and risk assessment recommended in respect of human health would apply to metals in respect of plant life. Therefore no specific action is considered necessary for plant life.

5.5 Pollution of Controlled Waters Risk Assessment

5.5.1 Risk Estimation

The risks to groundwater and surface water from contaminants on site have been assessed according to the Environment Agency (2006) Remedial Targets Methodology (RTM).

Under the European Water Framework Directive (2000/60/EC) pollutants from contaminated land sites are considered as passive inputs. Inputs to surface waters and inputs of non-hazardous pollutants to groundwater and are regulated under the Agency's 'limit' pollution objective. As such, site contaminant loadings are compared with relevant threshold values (Water Quality Targets) which are linked to the conceptual site model. Acceptable WQT are defined for protection of human health (based on Drinking Water Standards (DWS)) and for protection of aquatic ecosystems (Environmental Quality Standards (EQS)).

The approach for hazardous substances in groundwater is to use the 'prevent' pollution objective. Acceptable WQT are listed by UKTAG (November 2013, amended January 2014) and are minimum reporting values (MRV), referred to in this report as HAZ-MRV.

For the purposes of this report, the site data are compared with the various targets as set out according to the Hydrock scenario(s) in Table 5.2 on the basis of the following:

- The Glaciofluvial Deposits, Alluvium and Marlstone Rock are Secondary aquifers;
- The Wellingborough Limestone, Rutland Formation (undifferentiated), Stamford Member and Northampton Sand occupy the high ground in the southeast corner of the site. As such they are upstream in the groundwater flow regime and therefore are excluded as receptors for contamination originating on site.
- The Whitby Mudstone is classed as non-productive strata;
- The geological conditions mean that there is continuity between all groundwater units and the surface waters (Milton Malsor Brook and Milton Malsor Brook Eastern Arm);
- The presence of Glaciofluvial Deposits in the north of the site mean that the three most significant potential sources of groundwater contamination (Lodge Farm, the landfill and Rathvilly Farm pit) are in direct hydraulic continuity with surface waters due to the sandy nature of the Glaciofluvial Deposits; and
- It is unlikely that there is significant vertical downward migration of contamination through the Whitby Mudstone because of its low permeability.

Table 5.2: Summary of Water Quality Risk Assessment Protocol

Hydrock Scenario	Water Body Receptors	Secondary Receptors	Example Contaminant Linkages	RTM Level and Data Used	Water Quality Targets
D	Groundwater. Surface water.	Human health (abstraction). Aquatic ecosystem.	Contaminants from site leach or seep into groundwater body and this feeds surface water by base flow. The surface water may be used for human consumption and is an aquatic ecosystem.	RTM Level 2 - Groundwater.	DWS EQS (inland) HAZ-MRV
Notes: This table and the results of the assessment are considered as a first screening for potential risks of pollution of Controlled Waters. More specific requirements may be stipulated by the relevant Agency.					

The results of the Remedial Targets Methodology assessment are presented Appendix F and are summarised in Table 5.3.

There are no WQT for petroleum hydrocarbons in water. However, because of the sensitivity of the water environment to petroleum hydrocarbons, an initial screening exercise is also included in Table 5.3 irrespective of the assessment scenario stated in Table 5.2.

It should be noted that in some instances the reporting limit (or detection limit) quoted by the laboratory may be greater than the WQT that it is being assessed against. As the current exercise is an initial screening assessment, further assessment of these elements has not been undertaken.

Table 5.3: Chemicals of Potential Concern for Which Further Assessment is Required (Controlled Waters)

Chemical of Potential Concern	Water Quality Target (ug/l)	Basis for Water Quality Target	No. Samples	Min. (µg/l)	Max. (µg/l)	No. Samples Exceeding Target
Groundwater						
Aluminium	1	DWS	36	1	620	2
Boron	1000	DWS	36	19	2400	6
	2000	EQS	36			3
Cobalt	4	EQS	36	0.2	6.4	4
Chromium III	1	EQS	36	1	4.7	1
Copper	1	EQS	36	0.5	10	29
Iron	200	DWS	36	0.004	1800	6
	1000	EQS	36			2
Manganese	50	DWS	36	0.77	4900	21
	123	EQS	36			17
Sodium	200,000	DWS	36	5600	560,000	5
Selenium	10	DWS	36	0.6	51	3
Ammonium	500	DWS	36	15	2100	7
Chloride	250,000	DWS / EQS	36	8500	600,000	5
Nitrate	50,000	DWS	36	740	325,000	6
Nitrite	500	DWS	36	5	2800	5
Sulphate	250,000	DWS	36	29,900	345,000	23
	400,000	EQS	36			22
Max. pH	9.0	EQS	36	6.9	9.1	1

Chemical of Potential Concern	Water Quality Target (ug/l)	Basis for Water Quality Target	No. Samples	Min. (µg/l)	Max. (µg/l)	No. Samples Exceeding Target
Electrical conductivity	2500	DWS	36	320	6100	9
Antracene	0.1	EQS	36	0.01	0.28	1
Benzo(a)pyrene	0.01	DWS	36	0.01	0.1	1
Napthalene	2	EQS	36	0.01	2.84	1
PAHs = sum of benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(ghi)perylene, indeno(1,2,3-cd)pyrene	0.1	DWS	36	0.02	0.19	1
Petroleum hydrocarbons	10*	Water Supply Regs	13	0.01	1210	1
Surface Water						
Copper	1	EQS	5	4.9	10	5
Iron	200	DWS	5	55	340	2
Ammonium	500	DWS	5	46	760	1

Note: the maximum recorded value is compared with the water quality target.

* The Water Supply Regulations 1989 and the Private Water Supply Regulations 1991 both contained a prescribed concentration of 10 µg/l for "dissolved or emulsified hydrocarbons (after extraction with petroleum ether); mineral oils". This was removed when these Regulations were updated in 2000 (consolidated 2007) and 2009, respectively. However 10 µg/l is used in this report as an initial screening assessment as it is frequently the preferred approach of the Environment Agency.

5.5.2 Risk Evaluation

As discussed in Section 5.4.2 above, evaporite minerals may constitute natural sources of boron, sodium, chloride and sulphate. Copper, iron and manganese are commonly occurring elements within the earth's crust and it is likely that the presence of these chemicals is dissolution of natural mineralogical sources within the geology as opposed to pollution. In particular, the Blisworth Limestone upstream of the site is known to be rich in evaporite salts as a consequence of the geological conditions upon which it has been formed. The inland waters EQSs for copper and manganese are based on the bioavailable fraction and because bioavailability has not been calculated for these metals the assessment is conservative as it is based on the assumption of 100% bioavailability. Based on the above, boron, sodium, chloride, sulphate, copper, iron and manganese are not considered a significant risk to Controlled Waters.

A number of metals have been detected exceeding the corresponding DWS or EQS including aluminium, chromium III and cobalt at a small number of locations. The sources of these contaminants is uncertain, it is considered most likely that they are naturally occurring. However, their distribution across the site appears limited, with one exceedance for aluminium

and chromium III and 3 for cobalt. There is no detection of these substances within surface waters, and as such Hydrock do not consider these to represent a risk to Controlled Waters.

Nitrate, nitrite and ammonium are often associated with the use of fertiliser in agriculture. It is known that a quantity of nitrate based fertiliser is used at Lodge Farm and it is likely based on the similarity of the soil conditions that fertilisers are used on the surrounding land. In the case of ammonium, there is one instance of the DWS being exceeded in surface waters downstream of Lodge Farm (Milton Malsor Brook Eastern Arm).

The PAH and petroleum hydrocarbon contamination was found at one location (BHL009) in the landfill. It is possible that the petroleum hydrocarbons apparently detected are in fact PAH based on the level 1 test undertaken. There is no evidence of PAH or petroleum hydrocarbons in surface waters. It has not been possible to sample groundwater directly beneath the Rathvilly Farm pit as all the standpipes to date have remained dry.

Whilst there are elevated concentrations of Chemicals of Potential Concern, based on the investigation works undertaken to date and subject to agreement with the Local Planning Authority, who may in turn consult with the Environment Agency, Hydrock does not believe the site poses a significant risk to Controlled Water for the following reasons:

- Metal contaminants, along with chloride and sulphates are natural as opposed to the result of pollution.
- There is little indication under present conditions of pollution of Controlled Waters and conditions following development of the site will not be any worse, indeed they are likely to improve with cessation of agriculture.
- Whilst elevated concentrations of petroleum hydrocarbons and PAH have been found in soils in the landfill, Rathvilly Farm pit and the filling station, and groundwater beneath the landfill, there is no evidence of any impact in the surface water courses.

5.6 Ground Gases Risk Assessment

5.6.1 Assessment

The risks associated with the ground gases methane (CH_4) and carbon dioxide (CO_2) are assessed using BS 8485:2015 and guidance from CIRIA Report 665 (Wilson *et al* 2007). The development proposals require consideration of Situation A (all forms of development). The guidance requires the calculation of Gas Screening Values (GSV). For the purposes of the calculation, were the recorded gas flow rate is below the manufacturer's limit of detection for the instrument used, the detection limit has been adopted for the gas flow rate.

The monitoring reported in Appendix D may not have detected the worst-case conditions because of the temporal limitations of this investigation. The typical worst case GSV to date have been calculated as <0.07 l/hr for methane and <0.07 l/hr for carbon dioxide. In one instance, a GSV of 0.11 l/hr has been calculated in borehole RB02 at the proposed A43 bridge based in the main part on a relatively high flow rate in one visit. At Rathvilly Farm pit, methane has been detected at a concentration of 26.5% in one borehole (WSBL06), albeit with a

corresponding flow rate of <0.1l/hr. As this location is a significant distance from proposed buildings, no specific consideration is considered necessary.

Hydrock has undertaken 8 ground gas monitoring visits to date and monitoring is continuing for a period of 12 months. In accordance with CIRIA Report 665, 6 monitoring visits are required to provide a full understanding of the ground gas regime. The ground gas readings derived from the current works are considered sufficiently comprehensive to characterise the site. Based on data to date, and subject to ongoing monitoring, the site is provisionally classified as Characteristic Situation 1 (Situation A) for commercial/industrial buildings and no mitigation measures are required.

5.6.2 Ground Workers

It is noted that concentrations of carbon dioxide (an asphyxiant) in the soil exceed HSE Workplace Exposure Limits for personnel in the working environment of 1.5% for short term (15 minutes) exposure and 0.5% for long term exposure. Furthermore, soil concentrations of oxygen are below the HSE recommendations of 18%.

Whilst risks to construction workers are not generally discussed in this report, and soil gas concentrations are not necessarily reflected by those in the breathing zone, all contractors and maintenance workers should be made aware of the possible presence of carbon dioxide and should take all necessary health and safety precautions when working in trenches or confined spaces.

5.7 Construction Materials Risk Assessment

5.7.1 Water Pipelines

The current guidance on selection of materials for potable water supply pipes to be laid in contaminated land is contained in a document published jointly by Water UK and the Home Builders Federation (Water UK HBF (2014)). The protocols in that document are for guidance and are not subject to enforcement by Water UK or any agency, but have been adopted by Water UK and by HBF as best practice for their members. Accordingly this guidance is used in the following assessment. For further details see Appendix E.

A formal water pipe risk assessment is beyond the scope of this report, however, the findings of this investigation have been compared to the threshold values in Water UK Table 1 as far as is practicable to give an indication of the possible restrictions to the use of plastic pipes for water supply to the site.

The majority of the site is greenfield and the investigation and assessment has indicated no exceedance of the threshold values. It is envisaged that standard pipework will be suitable for the site. In the landfill, Lodge Farm and Rathvilly Farm pit areas, a number of the threshold values for PAH species and petroleum hydrocarbons are exceeded. In these areas, it is anticipated that barrier pipework will be required. However, this investigation was not designed specifically for water pipe runs and confirmation should be sought from the water supply company at the earliest opportunity.

Guidance from Anglian Water indicates that for large sites such as this it may be possible for the site to be classified as 'dual status', i.e. contaminated and non-contaminated, from the perspective of the water supply pipe requirements. In this way it may be necessary to prepare separate water pipe risk assessments on a plot by plot basis in order to demonstrate to the water supply company the suitability of standard polyethylene pipework in greenfield areas.

5.7.2 Other Construction Materials

In the landfill, Lodge Farm and filling station areas there is the potential for attack of exposed bitumastic building products due to the presence of organic contaminants within the Made Ground.

The implications for buried concrete are discussed in Section 6.8.

5.8 Findings of the Generic Risk Assessments

Particular areas of the site which are of potential concern are indicated on the Site Zonation Plan in Appendix A. The source-pathway-receptor contaminant linkages given in Table 5.4 are those which, following the risk evaluation process, require further consideration.

Table 5.4: Final Conceptual Model and Residual Risks Following Risk Evaluation

Contaminant Linkage			Comments	
Sources	**Pathways**	**Receptors**	**General**	**Mitigation**
PAH and petroleum hydrocarbons at Lodge Farm	Ingestion, inhalation or direct contact.	Human health.	GACs are exceeded by direct comparison. Hot spot, insufficient data for full statistical assessment	Further investigation and mitigation required.
PAH and petroleum hydrocarbons at the former Petrol Filling Station	Ingestion, inhalation or direct contact.	Human health.	GACs are exceeded by direct comparison. Hot spot area associated with the PFS	Further investigation and mitigation required.
Asbestos in the Made Ground at Lodge Farm	Inhalation of fugitive dust.	Human health.	Made Ground seen to contain asbestos-containing materials. Asbestos fibres detected in soil samples.	Further investigation and mitigation required.
Asbestos in the Made Ground at Rathvilly Farm pit	Inhalation of fugitive dust.	Human health.	Made Ground seen to contain asbestos-containing materials. Asbestos fibres detected in soil samples.	At this stage it is understood that this material is to remain in situ therefore no further action is required. However, mitigation will be necessary if earthworks or groundworks is proposed in this area of the site.

Contaminant Linkage			Comments	
Sources	**Pathways**	**Receptors**	**General**	**Mitigation**
PAH and petroleum hydrocarbons at Lodge Farm	Ingestion, inhalation or direct contact.	Human health.	GACs are exceeded by direct comparison. Hot spot, insufficient data for full statistical assessment	Further investigation and mitigation required.
Petroleum hydrocarbons in the vicinity of the Grand Union Canal leak	Ingestion, inhalation or direct contact.	Human Health	Minor exceedance of the GAC in the aliphatic C12 to C16 fraction.	Further investigation required. Mitigation may be required, subject to findings.
	Overland flow	Surface Water		
Radon	Migration through soils to indoor air.	End users of new buildings.	BR211 indicates basic radon protection required.	
PAH and petroleum hydrocarbons in the Landfill and Rathvilly Farm pit	Leaching through unsaturated zone.	Groundwater and possible abstractors.	WQT exceeded.	The site is not considered a risk to Controlled Waters as there is no impact on the Milton Malsor Brook. Consultation with the Local Authority is recommended.
		Surface waters and ecosystems.		
		Surface waters and ecosystems.		
		Surface waters and ecosystems.		

5.9 Mitigation Measures

Further investigation and risk assessment is necessary to determine the full extent of remediation measures necessary. However, based on the findings of the works to, the scope of remediation is likely to consist of the following:

- Removal by specialist contractors of asbestos from buildings in accordance with relevant legislation;
- Controlled decommissioning, decontamination and demolition of site buildings and ancillary structures such as tanks and the existing drainage system.
- Removal of the former fuel tanks at Lodge Farm and the Filling Station together with any petroleum hydrocarbon impacted soils around and below the tanks. Whilst not expected, any free phase hydrocarbons should be removed from the surface of the groundwater and treated or disposed.
- It is anticipated that remediation can then be undertaken by excavating the impacted Made Ground soils (where required) which can then be stockpiled, screened or otherwise treated on site (e.g. bioremediation).

- Suitable material can be reused where appropriate under a Materials Management Plan and the unsuitable material removed from site. Given the volume of earthworks, it is anticipated that all materials are likely to be suitable for use on the site, as unsuitable material from the perspective of human health is likely to be suitable for reuse in the platforms in areas external to the proposed buildings, e.g. in noise bunds.
- At this stage, with regards to the Rathvilly Farm pit, no specific remediation is anticipated as this area will form part of the landscape buffer zone.
- If Made ground is to remain in-situ at surface (e.g. former landfills in the north and northeast and the Rathvilly Farm pit), Hydrock would propose that as a minimum 450mm of topsoil / subsoil growing medium is placed over these sections of the site.
- Earthworks and remediation on site should be subject to a watching brief by an independent geo-environmental specialist to identify any areas of suspected contamination and recommend remedial measures.
- Since the site is in a Radon Affected Area with recorded radon levels in 1-3% of homes above the action level, it is recommended that consideration be given to incorporating basic protection measures.
- Protectaline pipework is potentially required subject to discussion with the Water Authority.

5.10 Waste Management and Materials Management

5.10.1 Waste

Any material excavated on site may be classified as waste and it is the responsibility of the holder of a material to form their own view on whether or not it is waste. This includes determining when waste that has been treated in some way can cease to be classed as waste for a particular purpose.

Whilst it is envisaged that a neutral cut-fill balance can be achieved, if material is to be removed from the site as waste, the laboratory test results in Appendix F should be presented to the proposed receiving landfill site (to aid Waste Characterisation), prior to export, to confirm that it is suitably licensed to accept them. Additional testing may be necessary at the time of disposal for the receiving landfill to confirm the Waste Acceptance Criteria (WAC) are acceptable for it to receive the waste.

Based on Hydrock's assessment it is envisaged that the waste natural soils may be classified as inert waste. However, the presence of sulphates may mean that the material may have to be classed as non-hazardous. Made Ground from the majority of the site is likely to be inert.

Excavated soils from Lodge Farm are likely to be classified as non-hazardous or hazardous waste (if containing visible asbestos or >0.1% asbestos). In addition, until proven otherwise, waste soils from the landfill should be considered as non-hazardous.

Non-hazardous waste requires pre-treatment prior to disposal. Effective pre-treatment, involving separation, sorting and screening can offer cost reductions through reducing the

hazardous nature and volume of soil waste. Costs for disposal of non-hazardous/hazardous soils are significant compared to disposal of inert material.

Prior to disposal, the characteristics of any excavated soils will need classification in consultation with landfill sites and waste disposal contractors. Testing and analysis will be required to be carried out on the actual soil arisings which will constitute the waste.

5.10.2 Materials Management

Any material excavated on site may be classified as waste and it is the responsibility of the holder of a material to form their own view on whether or not it is waste. This includes determining when waste that has been treated in some way can cease to be classed as waste for a particular purpose.

If site-won material is to be re-used on site, a Materials Management Plan will be required, signed off by a Qualified Person as defined in the 'Development Industry Code of Practice' (CL:AIRE, March 2011).

6.0 GEOTECHNICAL ASSESSMENT

6.1 Geotechnical Categorization of the Proposed Development

Eurocode 7, Section 2 advocates the use of geotechnical categorization of the proposed structures to establish the design requirements. For the purposes of this investigation, the proposed structures have been classed as Geotechnical Category 2. The Geotechnical Category should be re-assessed at the design stage and a specific Geotechnical Design Report is required for Category 2 structures.

6.2 Mineral Safeguarding

The northern part of the site is designated as a Mineral Safeguarding Area (MSA) under the Northamptonshire Minerals and Waste Local Plan (MWLP) (adopted May 2017). However, Hydrock believe that mineral resource will not be sterilised by the development as:

- The sands and gravel deposits do not extend as far to the south into the site as indicated in the MWLP, thus reducing the area of mineral safeguarding.
- As detailed in the Desk Study and as confirmed by site investigation there are a number of former sand pits on site in the northwest, north and northeast (now backfilled as landfill). This indicates that the exploitable resource have been depleted, with little room for significant sand and gravel extraction activates to be undertaken.
- The piecemeal nature of the site ownership and shape of the numerous land holdings across the northern part of the site, means that any potential quarrying operation would be unlikely.
- The location of the remaining small pockets of sand and gravel, which are located close to the southern boundary of Milton Malsor, means that any potential quarrying operation would be unlikely.
- The proposed development is limited in regards to its encroachment onto the Glaciofluvial Deposits in the north of the site.

In view of the factors listed above, Hydrock do not believe that the development will result in the sterilisation of exploitable mineral resources of economic importance.

With regards to the northeastern corner of the site being within the 300m buffer of an allocated sand and gravel extraction site (M1: Milton Malsor). This allocated sand and gravel extraction site is separated from the proposed SRFI development site by existing residential development and major pre-existing infrastructure in the form of roads and the Northampton Loop Rail line and there is no viable physical link between the proposed SRFI development and M1: Milton Malsor and as such, both operations are able to co-exist without impact on the other.

6.3 Groundwork

6.3.1 Site Preparation

There are a number of services on site that will require diversion or decommissioning as part of the development process including the BPA pipeline, overhead high voltage lines, the foul sewer aligning the Milton Malsor Brook and existing domestic connections within Barn Lane. There is a water supply borehole at Lodge Farm that will have to be decommissioned in accordance with Environment Agency protocol, on the assumption that there is no benefit to retaining it within the final development.

Development will necessitate demolition of the existing buildings. It is likely that foundations and other buried obstructions will be present and it is recommended that the demolition contracts allow for the removal of buried obstructions. There are underground storage tanks at the former filling station. The tanks have been filled. It is likely that a certain amount of petroleum hydrocarbon contamination will be present in the tank excavations and the surrounding soil, notwithstanding the limited contamination identified in this area of the site in this investigation. The removal of the tanks should be undertaken to a method statement taking this occurrence into consideration.

It is noted that on the low ground in the southwest of the site that the groundwater level over the winter is shallow. The current development layout will necessitate diversion of the Milton Malsor Brook. Maintaining drainage throughout groundworks is important, particularly as the soils on site are predominantly clay in nature and likely to soften rapidly where water is allowed to collect. It is recommended that the existing watercourse and ditches are backfilled with stone to allow, as far as is possible, the natural drainage channels to function during construction.

Topsoil and unsuitable Made Ground or subsoil should be removed from beneath all the proposed embankments. Given the scale of the proposals a large volume of topsoil will have to be removed and stockpiled. It will be necessary to consider the stability of the stockpiles in addition to the location and any planning restrictions on stockpile heights.

6.3.2 Groundworks

Excavation within the superficial deposits and shallow, residual clay soils is likely to be readily undertaken with conventional plant and equipment. Within the Whitby Mudstone, Dyrham Formation, and in particular the Marlstone Rock, excavation is likely to require hydraulic breaker attachments or ripping shanks to enable plant to penetrate hard strata. There will be a reduction in progress where it is necessary to rip or break out rock.

The majority of excavations within clay strata were stable over the period of time for which they were open. Excavation within the Made Ground (landfill), Alluvium and, in particular, the Glaciofluvial Deposits, were frequently found to be unstable. In the case of the Alluvium, the instability was exacerbated by water inflow. However, the Glaciofluvial sands were generally dry at the time of fieldworks. Temporary trench support, or battering of excavation sides, is likely to be required for all excavations that are to be left open for any length of time, and will definitely be required where man entry is required. Particular attention should be paid to

excavation at, or close to, site boundaries/adjoining existing roads/structures/buildings, where collapse of excavation faces could have a disproportionate effect.

A risk assessment of the stability of any open excavation should be undertaken by a competent person and appropriate measures adopted to ensure safe working practise in and around open excavations. Further guidance on responsibilities and requirements for working near, and in, excavations can be obtained from the Construction Design and Management Regulations (2015).

Based on site observations and monitoring data, long term groundwater levels vary between very shallow (0.05m) and relatively deep (10.23m). Shallow groundwater is generally associated with the Alluvium and the Whitby Mudstone in the lower ground in the south and southwest of the site.

Significant groundwater flow was observed within limestone bands in the Whitby mudstone and the Marlstone Rock bed. For excavations within the Whitby Mudstone, it may be found that the rate of groundwater ingress is sufficiently slow to control groundwater by sump pumping of excavations. However, it is cautioned that rapid groundwater ingress may occur upon encountering limestone bands within the Whitby Mudstone or the Marlstone Rock.

Based on the groundwater monitoring undertaken to date, areas of the proposed development platforms may lie below the level of the long term groundwater table. In the majority of cases, this relates to the phreatic level within the Whitby Mudstone and therefore it is envisaged that water ingress during construction will be limited by the low permeability of this soil. In the case of Units 8, 9 and 10, it is possible the eastern end of the platform will encounter the Marlstone, where significant water ingress could occur. In either case, the permanent drainage design should consider the potential for additional water occurring in these areas over and above the contribution from surface water.

In the Alluvium and Marlstone Rock, significant groundwater ingress was encountered in places and alternative methods of dewatering including cut-offs, or well points, may prove necessary. However, it should be recognised that groundwater levels will fluctuate seasonally and the timing of construction may dictate the extent of groundwater control required.

6.3.3 Earthworks/Reuse of Site-Won Materials

Excavation of borrow pits may be required to obtain high quality structural fill, these borrow pits would be located on the SRFI site, either in areas of proposed car parking (where higher settlements can be tolerated) or in landscape areas. Any soils excavated from borrow pits would be transported on the SRFI site only and the borrow pits would be backfilled with inert soils from the site to a suitable Specification and restored following construction, either as car parking areas or landscaped open space.

With reference to the Specification for Highway Works, the preliminary assessment undertaken in this investigation indicates soils may be suitable for reuse in the following material classes for General Fill based on grading:

- Topsoil – Class 4 Landscape Fill (where proven suitable) and / or Class 5 Topsoil;

- Made Ground (landfill) – combination of Class 1 and Class 2, subject to removal of over-sized material and processing;
- Made Ground (Roade Cutting) – Class 2A/B and 2C subject to removal of over-size material;
- Alluvium – predominantly Class 2 based on grading, in places Class 1, subject to removal of any unsuitable organic material;
- Glaciofluvial Deposits – predominantly Class 1;
- Whitby Mudstone – predominantly Class 2A/B, in places Class 2C;
- Marlstone rock Formation – Class 2C based on a single test, however it is anticipated that the excavated Marlstone Rock Formation is likely to consist of a mixture of granular and cohesive material, and contain a large proportion of over-sized rock fragments; and
- Dyrham Formation – mixture of Class 2A/B and Class 2C.

Within the landfill Made Ground, compaction testing with the 4.5 kg rammer indicated maximum dry densities of between 1.80 Mg/m^3 and 1.86 Mg/m^3 with optimum moisture contents of 14 to 15%. Natural moisture contents ranged between 21% and 25%. A single sample of the Roade Cutting Made Ground was tested with the 2.5 kg rammer and it was found to have an optimum moisture content of 22% and corresponding maximum dry density of 1.59 Mg/m^3. The natural moisture content was 32%. A single test was undertaken using the 4.5 kg on 'general' Made Ground from within the floodplain area. The results indicated a maximum dry density of 1.41 Mg/m^3 and optimum moisture content of 31%. Natural moisture content was 41%. Based on the results and the location from where the sample was collected it is likely the material is derived from Alluvium.

Compaction testing on the Alluvium using the 2.5 kg rammer on clay specimens indicated maximum dry densities ranging between 1.41 Mg/m^3 and 1.57 Mg/m^3 and optimum moisture content ranging between 20% to 22%. A single 4.5 kg rammer test of a sample of the Alluvial gravel gave a maximum dry density of 2.05 Mg/m^3 and optimum moisture content of 13%. Natural moisture content within the Alluvium range between 15% and 49%. For the purpose of studying the compaction characteristics, all organic deposits were excluded from the dataset.

Compaction testing on the Glaciofluvial Deposits sand was undertaken with the 4.5 kg rammer. Maximum dry densities range between 1.73 Mg/m^3 and 1.90 Mg/m^3 and optimum moisture contents between 9.5% and 15%. Natural moisture content ranged between 4.3% to 22%. A single sample of clay of Glaciofluvial origin was tested with the 2.5 kg rammer. A maximum dry density of 1.56 Mg/m^3 and optimum moisture content of 24% was determined. The natural moisture content was 37%.

A sample of Glacial Till was tested using the 4.5 kg rammer and a maximum dry density of 1.79 Mg/m^3 was determined with a corresponding optimum moisture content of 16%. The natural moisture content of the sample was 21%.

A single compaction test on a sample of the Northampton Sand indicated a natural moisture content and optimum of 21% and a corresponding maximum dry density of 1.68 Mg/m^3. No gradings were undertaken due to the limited sample volumes recovered, but it is envisaged this material would be acceptable as either Class 1 or Class 2C material.

The Whitby Mudstone was tested using the 2.5 kg and 4.5 kg rammers. With the 2.5 kg rammer, maximum dry density ranged between 1.48 Mg/m^3 and 1.82 Mg/m^3 with an optimum moisture content range of 11% to 26%. With the 4.5 kg rammer, the maximum dry density ranged between 1.52 Mg/m^3 and 1.88 Mg/m^3 with optimum moisture content of between 12% and 24%. Natural moisture content in the Whitby Mudstone ranged between 21% and 43%.

In the Marlstone Rock, one sample of clay and one sample of gravel were tested using the 4.5 kg rammer. The maximum dry density measured ranged between 1.87 Mg/m^3 and 1.89 Mg/m^3 and optimum moisture was 12% in both cases. Natural moisture content ranged between 16% and 23%.

Samples of the Dyrham Formation were tested using both the 2.5 kg and 4.5 kg rammers. With the 2.5 kg rammer, the maximum dry density ranged between 1.54 Mg/m^3 and 1.64 Mg/m^3 with optimum moisture content ranging between 14% and 24%. Using the 4.5 kg rammer, the maximum dry density ranged between 1.81 Mg/m^3 and 2.00 Mg/m^3 and optimum moisture content between 10% and 18%. The natural moisture content of samples of the Dyrham Formation ranged between 19% and 23% in compaction samples, and 7.6% and 30% over all samples.

Testing has shown that, with the exception of some of the Glaciofluvial sand and Northampton Sand, the majority of soils are wet of the optimum moisture content for recompaction. In addition, there is some overlap in the maximum dry densities achieved with the light and heavy rammers, both within materials of the same geological origin and between materials of different origins. Earthworks will have to take these factors into consideration, particularly where Selected Fill is required to support the buildings on the development platforms.

The presence of sulphates, or the potential for sulphates to form, is critical in the assessment of suitability for a soil to be stabilised. Sulphate can combine with water, natural minerals within the clay and calcium present in lime to form expansive materials. Based on the sulphate and total sulphur concentrations measured, the use of hydraulic binders is considered to be unsuitable at this site. As it is necessary to dry soils in order to make them acceptable for use, air drying is likely to be the most realistic option, with the obvious implication that the works would need to be undertaken in the summer. It is recommended that this is taken into consideration during the scheduling of earthworks phases of the construction works.

Where it is proposed to re-use site won materials as an engineered fill, it will be necessary to develop an appropriate Site Specific Earthworks Specification as part of the GDR which can be adopted as part of the contract documentation.

The basis for the Specification should be BS 6031:2009 and the latest version of the SHW, Series 600 Earthworks. In addition to the reuse of materials in different classes (i.e. General and Selected Fill) the design should take into consideration the following:

- foundations for embankments, including removal of any soft or otherwise unsuitable material;
- requirements for a starter layer for filling;
- drainage requirements;

- material handling and stockpiling;
- settlement of embankments;
- stability of temporary and permanent slopes; and
- retaining structures.

6.3.4 Consolidation Settlement from Land Raising

All topsoil and Made Ground should be removed from below the development platforms prior to placement of fill. For landscape areas and noise bunds the Made Ground can likely remain in situ, subject to detailed design. If significant loads are to be placed on the Made Ground, for example noise bunds, ground improvement may be required.

Proposals include the construction of embankments over infilled watercourses of up to 5m height. Embankments constructed over the existing areas of Alluvium will undergo settlement due to consolidation of the founding strata. The magnitude of settlement will depend on the nature and thickness of the Alluvium. Organic deposits are present within the Alluvium adjacent to the Milton Malsor Brook and Eastern Arm in the north of the site, but is likely to be present also in close proximity to the watercourses in the south. Where organic deposits are present settlement is likely to be significant and it is recommended that this material is removed prior to construction of earthworks.

As part of the geotechnical design, the likely magnitude and rate of settlement should be considered in the assessment of the embankment stability. Based on the laboratory oedometric modulus, settlement in the order of 65 to 100mm could be induced in the Alluvium in the south of the site if it were to remain in situ without any treatment. It may therefore be necessary to remove and re-engineer or replace Alluvium where the consolidation settlement is perceived to be a problem. However, such settlement may be tolerable taking the construction period into consideration, whereby post construction settlement may be comparatively small.

6.4 Foundations

Based on the current earthworks model, the topography of the site and available information on the proposed layout, all of the proposed buildings will span areas of both cut and fill. Geotechnical Design Reports will be required for foundation designs.

6.4.1 Pad Foundations

Pad foundations are generally considered an appropriate solution for the proposed development where foundations are to be constructed in natural ground. Foundations should be the subject of a plot specific geotechnical design. The comments in this section are provided as a guide to facilitate outline design of the buildings.

An allowable net bearing pressure of 120kN/m^2 to 150kN/m^2 should be available for the design of nominally sized pad foundations founded within the Glacial Till, Whitby Mudstone Formation, Marlstone Rock and Dyrham Formation. In the north of the site buildings may span contrasting deposits of Glaciofluvial sand and Whitby Mudstone. It is anticipated that the Glaciofluvial Deposits will be capable of supporting nominally sized pads with an allowable net bearing

pressure of 120kN/m^2 to 150kN/m^2. In areas of deeper cut, it may be possible to adopt an increased allowable bearing pressure taking into consideration relief of overburden. However, the zoning of such areas may prove difficult in practice due to the varied overburden depths, cut and fill and different geological materials present.

Where foundations are to be supported in engineered fill, the end performance will be determined by the earthworks specification, supervision and control. Subject to design, it could be reasonably assumed that an allowable bearing pressure in the order of 120kN/m^2 could be achieved with the engineered fill materials available without excessive settlement. However, this will require detailed design of the fill placement and the specific foundation types.

The depth of foundations should be designed, and the formations inspected by, a Geotechnical Engineer. Any sub-formation materials deemed as unsuitable such as soft or loose zones should be excavated and replaced with well compacted suitable granular fill or lean mix concrete. It may be necessary to consider the influence of existing trees where foundations are to be placed in natural ground in areas where ground levels are to be relatively un-changed from current levels. The potential for heave associated with tree removal could be mitigated by over excavation and recompacting soils to allow the negative pore pressure associated with tree roots to be dissipated, or by provision of heave protection.

Foundation excavations should be protected from water and inclement weather including frost and any water should be removed by pumping from a sump in the base of the excavation.

Glacial Till, Whitby Mudstone and the Dyrham Formation are over consolidated clay and can swell and soften readily when allowed access to free water. Groundwater monitoring indicates the presence of high perched water in areas of the site. Therefore, care will be required to ensure that foundation excavations are kept as free of water as practicable and that concrete is poured as soon as practicable after excavation.

6.4.2 Piled Foundations

It may be necessary to consider piled foundations at the site for particularly heavy structures or where a very tight tolerance to settlement is required, for example a rail mounted travelling crane which may form part of the intermodal infrastructure proposed for the site. The design of foundations should be subject of separate geotechnical design reports.

Driven piles, bored piles with the use of casing or CFA piles should be suitable for this site. However, the choice of piling system and detailed design of piles are beyond the scope of this report and should be undertaken the specialist piling contractor taking into account the following considerations.

- Requirements for reinforcement, particularly if high lateral loads are to be supported by the piles.
- Obstructions in the ground, such as old foundations or bands of strong rock such as the Marlstone rock, can cause piles to stop at shallower than design depth, or deviate from the vertical, thereby reducing their capacity.

- Pile, and in particular bored pile, installation can create preferential pathways for the migration of contaminants to the groundwater where they are present.
- Boring of piles in coarse soils is likely to result in loosening of the soils, with resultant reduced shaft friction.
- the post-fieldwork monitoring and temporary casing may be required for bored piles unless CFA piles with placement of concrete as the pile is withdrawn, are used.
- Piles should extend a minimum of five pile diameters into the bearing stratum to fully mobilise end-bearing resistance and skin friction.
- It may be necessary to consider negative skin friction where piles are below a significant thickness of newly placed fill.
- Care should be taken for bored and cast in situ piles taken through the Made Ground/soft alluvium/loose sands where collapse of the pile shaft or running sand conditions could lead to 'necking' of the pile.

6.4.3 Piling Risk Assessment

A risk assessment may be necessary for piling, where there is a possibility that this could lead to creation of new pathways for migration of contamination.

6.4.4 Working Platform

For piling, a working platform will be required prior to the arrival on site of tracked plant. This should be designed and installed in accordance with BR470 (BRE 2004) based on data on the piling plant in accordance with an FPS certificate for the rig loadings.

6.5 Ground Floor Slabs

Detailed design recommendations for ground floor slabs will be presented in a Geotechnical Design report for the site. In general, it could be reasonably anticipated that soils of the Whitby Mudstone should be capable of supporting a ground floor slab with a nominal uniformly Distributed Load (UDL) of 50 kN/m^2 without excessive settlement or cracking. Subject to undertaking earthworks to an appropriate specification, a modulus of subgrade reaction (k) of 35 MN/m^2/m could be assumed for the preliminary design of ground floor slabs supported on earthworks. If higher loads are required, this may be able to be increased during the design process by the use of increased stone layer thicknesses and geogrids.

Prior to the placement of the founding materials and the construction of the ground bearing floor slab, the sub-formation and formation will need to be inspected and checked by a geotechnical engineer to ensure the ground conditions are as expected. In accordance with The Concrete Society Technical Report 34 (The Concrete Society 2013), this shall include the measurement of modulus of sub-grade reaction (k) determined by static plate load testing to confirm the ground conditions at time of construction are consistent with the design parameters derived from this ground investigation.

Following excavation and testing, suitable imported granular material should be placed and compacted in accordance with a suitable specification such as the Specification for Highway

Works (Highways Agency 2014). Incorporation of triaxial geogrid reinforcement at sub-formation level, directly below the compacted granular material, will minimise required excavation depths and help provide a suitable foundation for the ground bearing slab.

Ground floor slabs should be designed to incorporate any gas mitigation measures that may be required as discussed within the previous sections of this report.

6.6 Roads and Pavements

Design parameters for roads and pavements should be included in a Geotechnical Design Report. With reference to the document HA IAN 73/06, a long term equilibrium CBR of 2.5% should be adopted for preliminary design.

Proof rolling of the formation level will be required and any loose or soft spots should be removed and replaced with an engineered fill, in accordance with a suitable Specification. The formation level will also need to be protected during inclement weather from deterioration; all slopes should be trimmed to falls to shed rain water and the surface sealed to limit infiltration.

Prior to the placement of the founding materials and the construction of the road pavement, the sub-formation and formation will need to be inspected and checked in accordance with a suitable specification to ensure the ground conditions are as expected. All testing should be carried out in accordance with DMRB IAN 73/06 to confirm that the ground conditions at time of construction are consistent with the previous design parameters.

Where the CBR is found to be less than 2.5%, the sub-grade may be unsuitable for both the trafficking of site plant and as support for a permanent foundation, without improvement works being undertaken. Improvement works should be carried out in accordance with DMRB IAN 73/06 Rev 1 Chapter 5. In summary, consideration may be given to the following potential remedial techniques:

- excavation and re-engineering or replacement of weaker soils;
- the inclusion of geosynthetic reinforcement within the unbound layers of the capping and sub-grade; and
- where granular soils are present, de-watering and re-engineering the formation.

6.7 Soakaways and Drainage

The testing summarised in Table 4.11 has not returned infiltration rates suitable for design of soakaways in accordance with BRE365. In a number of tests within the Glaciofluvial Deposits in the north of the site and to the east of Northampton Road, tests achieved 75% or 50% of the initial volume within the allotted time. The relatively clean sand present in this area of the site meant that instability of trial excavations during the test was a problem. Soakaway tests in the Glaciofluvial Deposits on the western side of Northampton Road performed slowly.

The clay soils on site are unsuitable for soakaway drainage which discounts this option for disposal of surface water over the great majority of the site. Should it be desirable to explore the option further in the north of the site, it is recommended that additional testing is

undertaken to confirm the infiltration rate for design. This could include support of the test excavation with a granular backfill material and the use of electronic data loggers to allow the tests to be continued over a greater period of time.

6.8 Buried Concrete

Based on guidelines provided in BRE Special Digest 1 (BRE 2005), the soils can be classified as Design Sulphate Class DS4 and ACEC Class AC-4 (see Section 4.4.4).

7.0 UNCERTAINTIES AND LIMITATIONS

7.1 Site-Specific Comments

The investigation undertaken to date provides a preliminary assessment of the entire site. Further investigation, risk assessment and detailed geotechnical design will be necessary for the individual plots and key infrastructure elements within the development. The site area surveyed was correct at the time of the site investigation works and is reflective of the land required for the development of the Main SRFI.

Investigation has been limited in areas of the site, for example Lodge Farm, because of the continued occupation and use of the buildings. Further investigation and risk assessment has been recommended for this area of the site. It may not be possible to fully assess conditions at this area prior to demolition of the existing buildings.

At present, there is one land parcel within the proposed development that has not been investigated pending negotiation of access rights. Hydrock do not believe this land parcel requires investigation with regards to this preliminary assessment as there are no identified contaminant sources in this land parcel.

Monitoring is on-going and the conclusions of this report will be updated following completion of the scheduled monitoring.

7.2 General Comments

This report details the findings of work carried out between August 2016 and June 2017. The report has been prepared by Hydrock on the basis of available information obtained during the study period. Although every reasonable effort has been made to gather all relevant information, all potential environmental constraints or liabilities associated with the site may not have been revealed.

The report has been prepared for the exclusive benefit of Ashfield Land and those parties designated by them for the purpose of providing geotechnical and geo-environmental recommendations for the site. The report contents should only be used in that context. Furthermore, new information, changed practices or new legislation may necessitate revised interpretation of the report after the date of its submission.

Hydrock has used reasonable skill, care and diligence in the design of the investigation of the site. The inherent variation of ground conditions allows only definition of the actual conditions at the locations and depths of trial pits and boreholes at the time of the investigation. At intermediate locations, conditions can only be inferred.

Groundwater findings described are only representative of the dates on which they were made and levels may vary.

Unless otherwise stated, the recommendations in this report assume that ground levels will remain as existing. If there is to be any re-profiling (e.g. to create development platforms or for flood alleviation) then the recommendations may not apply.

Information provided by third parties has been used in good faith and is taken at face value; however, Hydrock cannot guarantee its accuracy or completeness. It is assumed that previous reports provided have been assigned to the Client and can be relied upon. Should this not be the case Hydrock should be informed immediately as additional work may be required.

The work has been carried out in general accordance with recognised best practice. The various methodologies used are explained in Appendix E. Unless otherwise stated, no assessment has been made for the presence of radioactive substances or unexploded ordnance. Where the phrase 'suitable for use' is used in this report, it is in keeping with the terminology used in planning control and does not imply any specific warranty or guarantee offered by Hydrock.

The chemical analyses reported were scheduled for the purposes of risk assessment with respect to human health, plant life and controlled waters as discussed in the report. Whilst the results may be useful in applying the Hazardous Waste Assessment Methodology given in Environment Agency Technical Guidance WM3, they are not primarily intended for that purpose and additional analysis may be required should waste classification be required for consideration of off-site disposal of contaminated soils. Separate analyses will be required to meet the Waste Acceptance Criteria for specific landfill sites.

Unless otherwise stated, the chemical testing carried out for this report was not scoped to comply with the requirements of the water supply company and further work may be required.

The preliminary risk assessment process may identify potential risks to site demolition and redevelopment workers. However, consideration of occupational health and safety issues is beyond the scope of this report.

Please note that notwithstanding any site observations concerning the presence or otherwise of archaeological sites, asbestos-containing materials or invasive weeds such as Japanese knotweed, this report does not constitute a formal survey of these potential hazards.

Any site boundary line depicted on plans does not imply legal ownership of land.

8.0 RECOMMENDATIONS FOR FURTHER WORK

The following further works will be required to finalise this report:

- completion and reporting of the scheduled gas and groundwater monitoring.
- discussions with regulatory bodies regarding the conclusions of this report.

Following the above works and as part of future design works, further works will include:

- further design investigations to allow design, including areas of the site where access has currently been restricted;
- pre-demolition surveys including asbestos;
- discussions with service providers regarding the materials suitable for pipework etc.;
- discussions with regulatory bodies regarding the conclusions of further reports;
- preparation of Geotechnical Design Reports (GDR) for platforms, areas of key infrastructure and Category 2 structures;
- detailed design;
- preparation of a Remediation Method Statement;
- remediation in specific areas of site;
- cut to fill earthworks;
- site watching brief during earthworks and remediation; and
- verification of the works.

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Appendix A

Drawings

Drawings included in this report:

151171/D001 Rev B – Site Location Plan

151171/D002 Rev B – Site Extents Plan

151171/D003 Rev B – Site Features Plan

151171/D004 Rev G – Exploratory Hole Location Plan

151171/D005 Rev B – Site Geology Plan

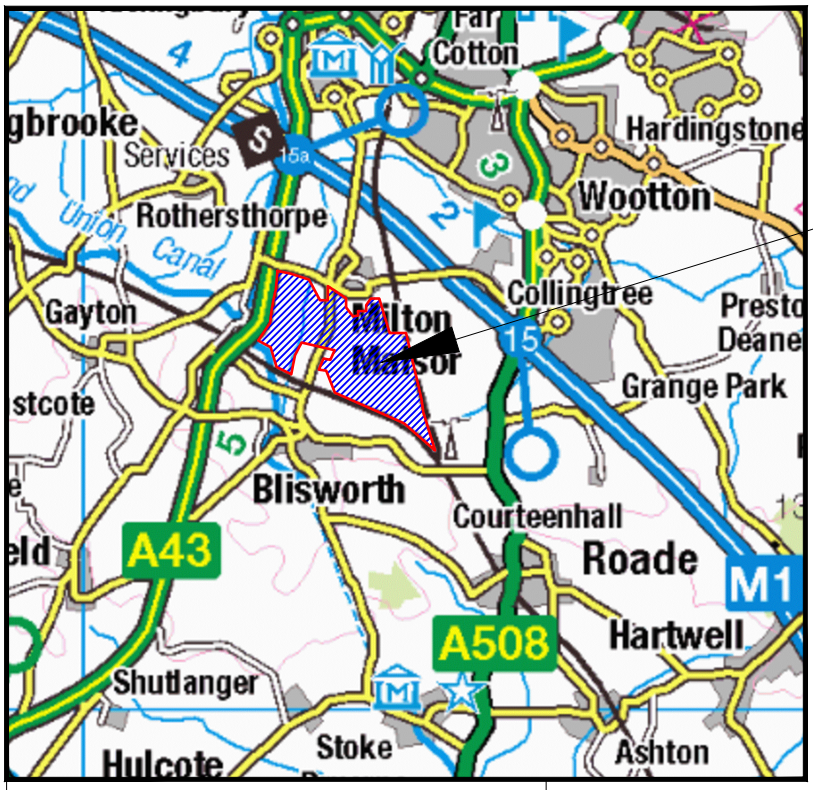
151171/D006 Rev A – Site Zonation Plan

151171/D007 – Interpretative Cross Sections

151171/D008 – Groundwater Levels at Development Plateaus

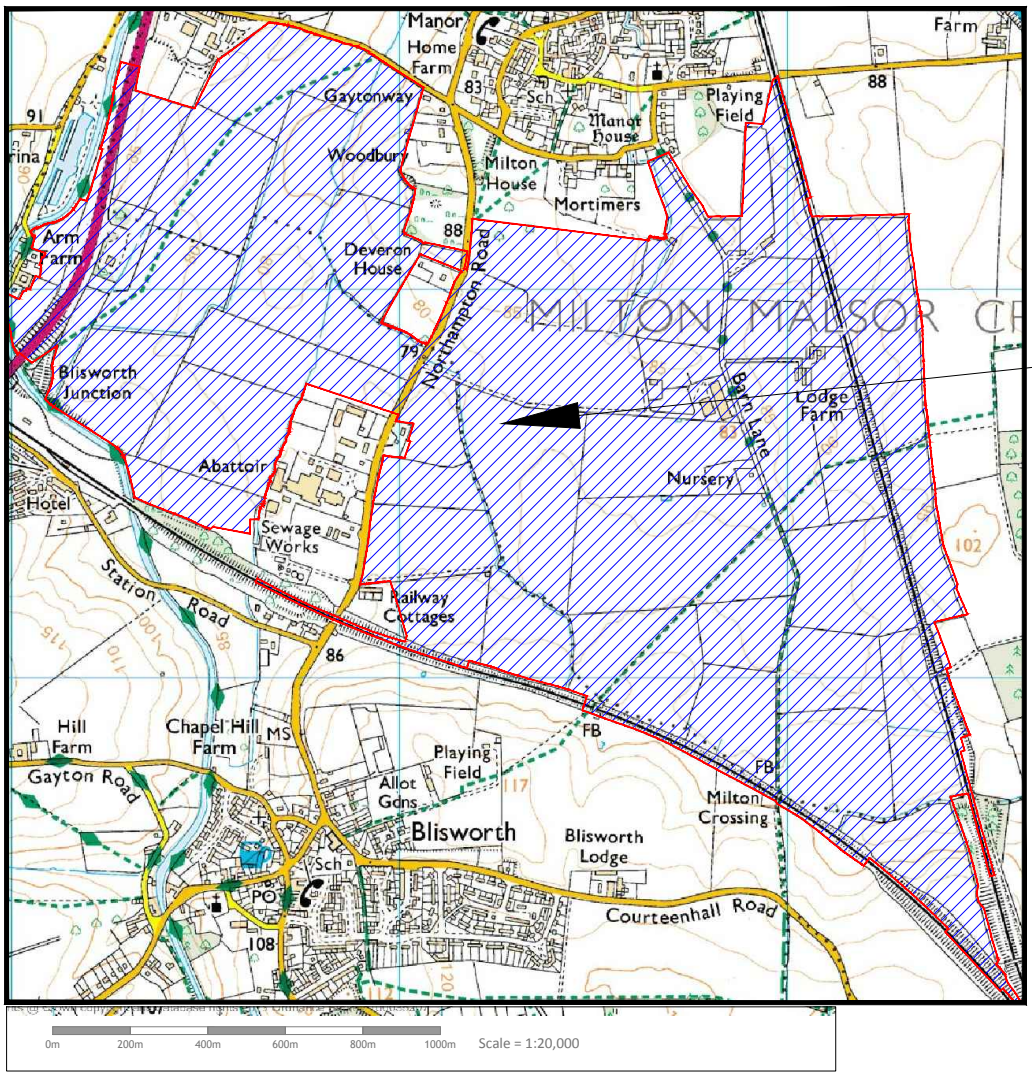
Notes:

1. Contains Ordnance Survey data © Crown copyright and database right 2015



THE SITE





THE SITE

Rev	Date	Description	By	Ckd
C	09/02/18	Boundaries revised	NS	AB
B	07/06/17	Boundaries revised	RB	AB
A	14/02/17	Boundaries revised	RB	AB

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Client :

Ashfield Land

Project Title:

Rail Central, Milton Malsor

Drawing Title:

Site Location Plan

Drawing Status:

FINAL

Hydrock Job No:

C151171

Drawn	Checked	Scale @ A4	Date	Issue Date
NS	AB	See Drawing	09/02/18	09/02/18

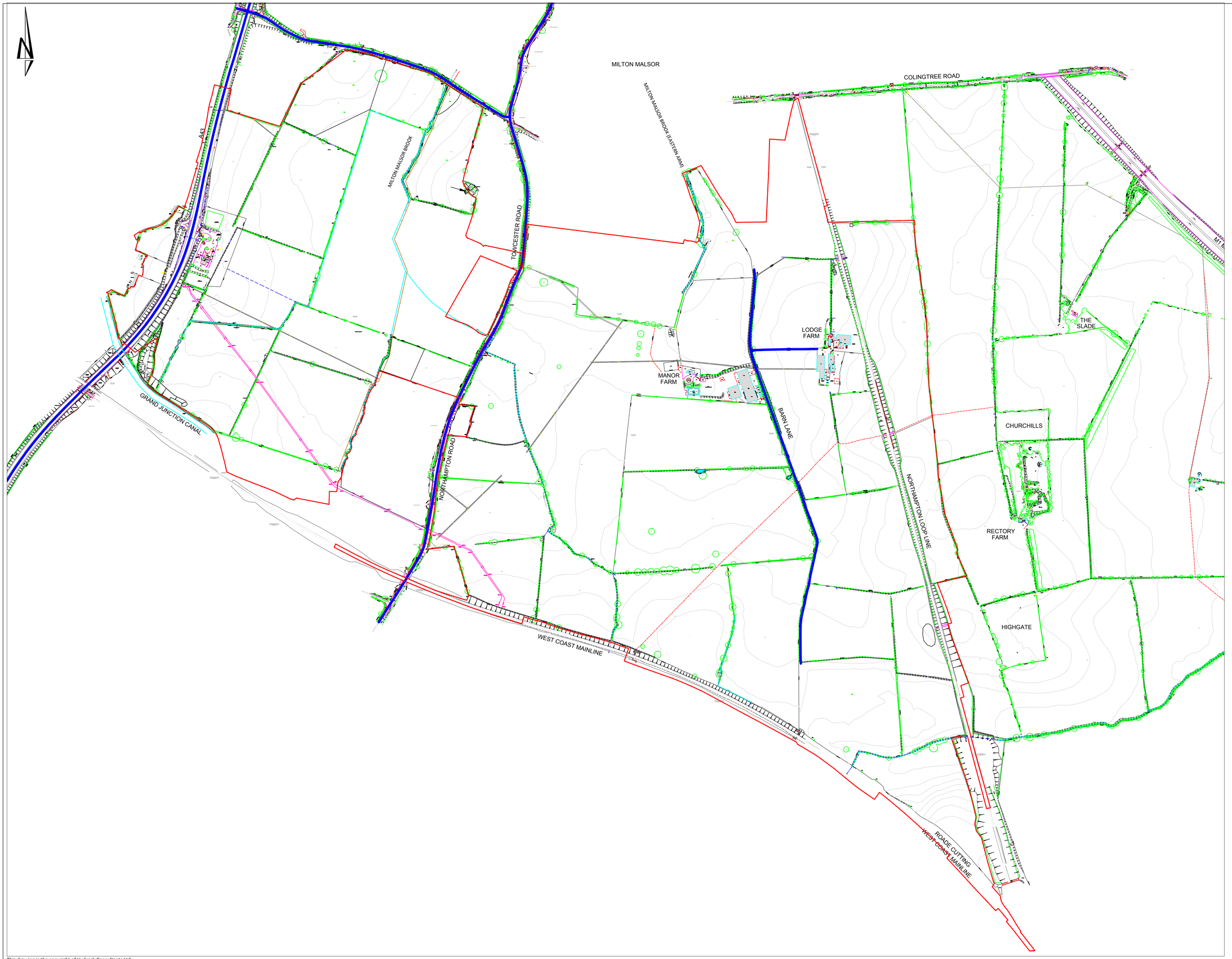
Drawing Number:

C151171/D001

Revision:

C

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Notes:

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2. This drawing is to be read in conjunction with all relevant Engineers' and Service Engineers' drawings and specifications.

Key

- Railway line
- Road
- Footpath
- Foul sewer
- BPA Oil Pipeline
- Watercourses
- Trees/Hedges

Rev	Date	Description	By	C. d
C	09/02/18	Updated Site Boundary	NS	AB
B	06/07/17	Updated	RB	AB
A	14/02/17	Updated	RB	AB

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Client :

ASHFIELD LAND

Project Title:

MILTON MALSOR, NORTHAMPTONSHIRE

Drawing Title:

Site Extents Plan

Drawing Status:

FINAL

Hydrock Job No:

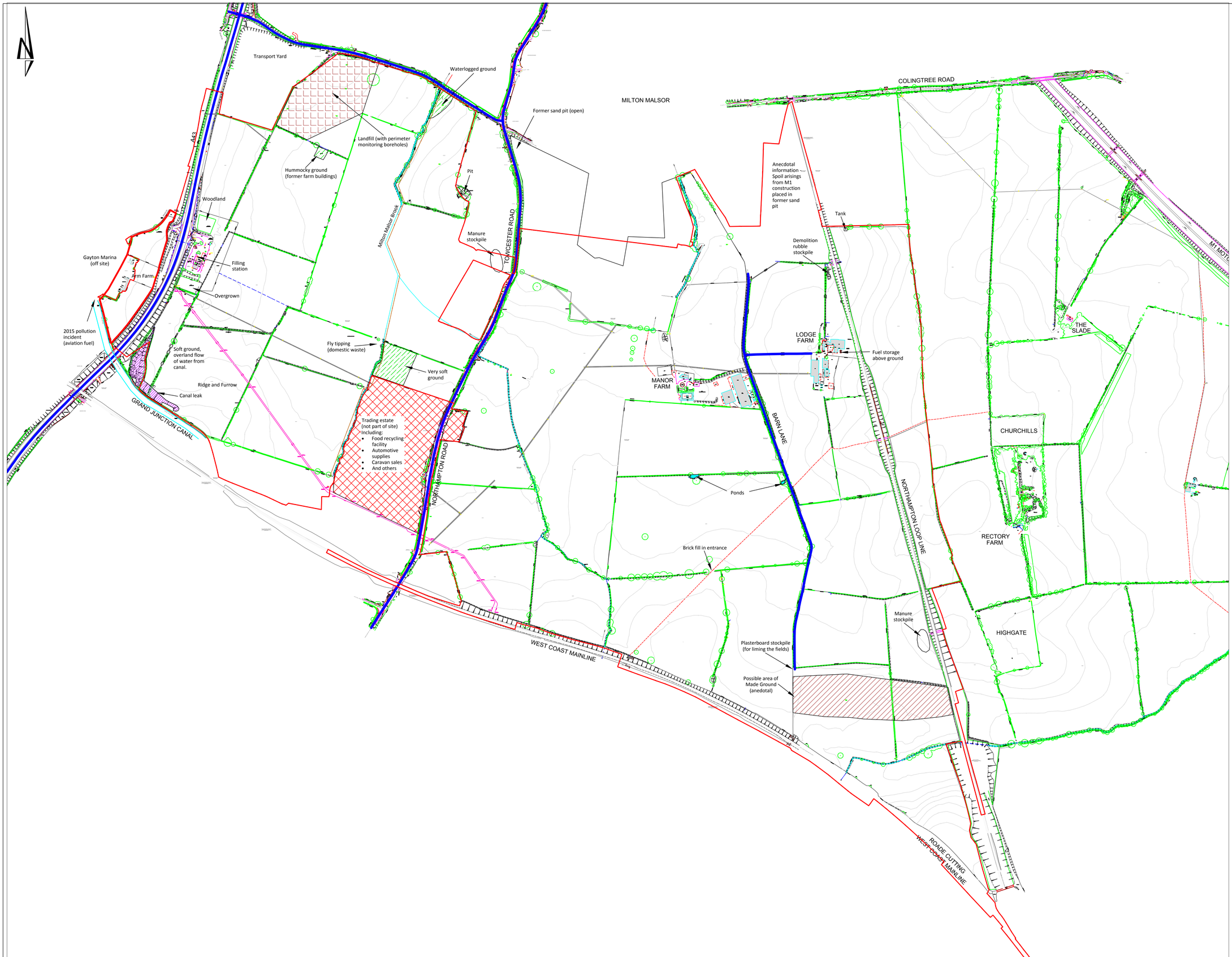
C151171

Drawn	Checked	Scale @ A1	Date	Issue Date
NS	AB	1:5000	09/02/18	09/02/18

Drawing Number: 151171/D002

Revision: C

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Notes:

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2. This drawing is to be read in conjunction with all relevant Engineers' and Service Engineers' drawings and specifications.

Key

- Railway line
- Road
- Footpath
- Foul sewer
- BPA Oil Pipeline
- Watercourses
- Trees/Hedges
- No access during site walkover
- Possible Landfill (extents not defined)
- Raised earthworks

Rev	Date	Description	By	Ckd
C	09/02/18	Site Boundary Updated	NS	AB
B	06/07/17	Updated	RB	AB
A	16/11/16	Updated	RB	AB

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Client :

ASHFIELD LAND

Project Title:

RAIL CENTRAL, MILTON MALSOR, NORTHAMPTONSHIRE

Drawing Title:

Site Features Plan

Drawing Status:

FINAL

Hydrock Job No:

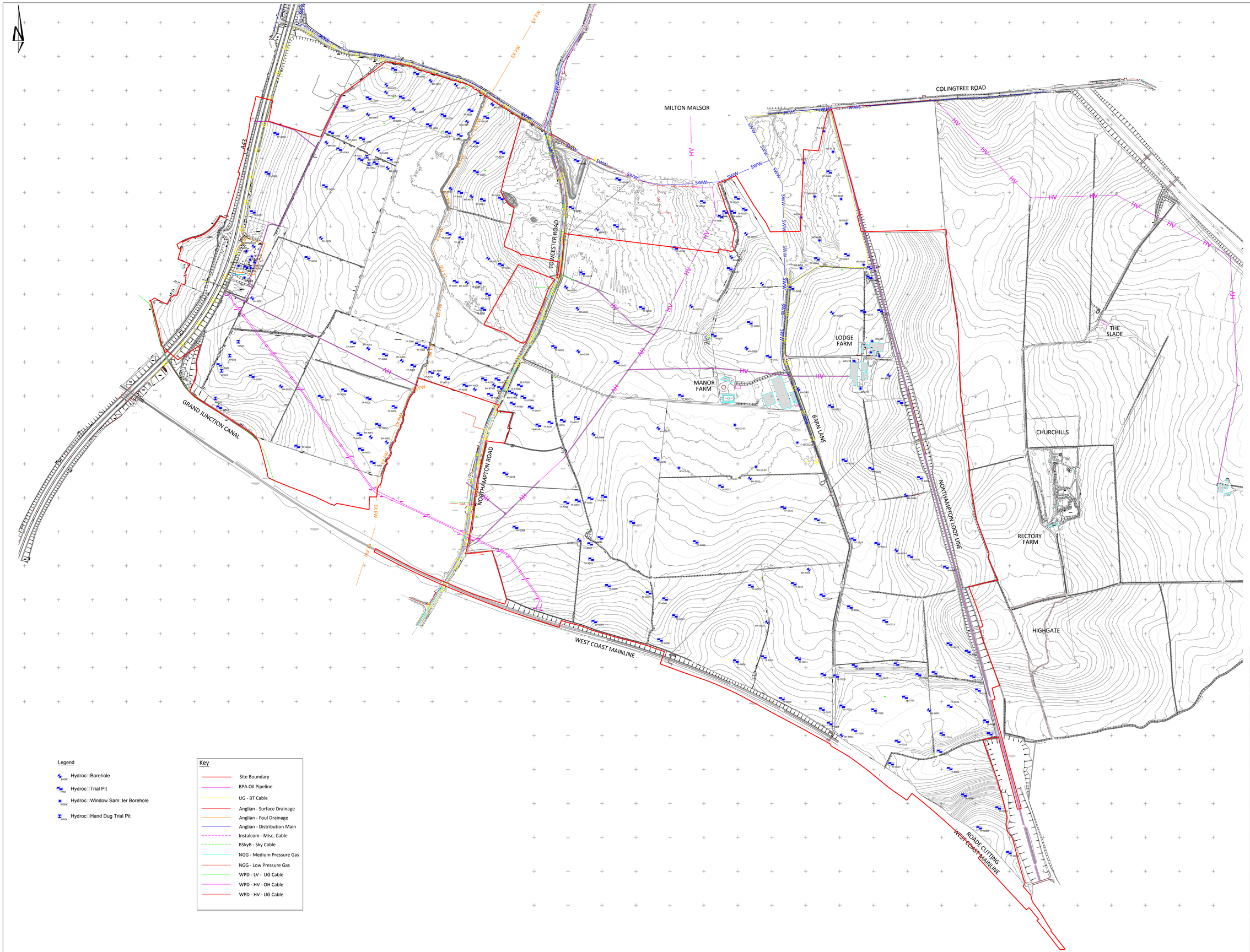
C151171

Drawn	Checked	Scale @ A1	Date	Issue Date
NS	AB	1:5000	09/02/18	09/02/18

Drawing Number: 151171/D003

Revision: C

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Notes:

1. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.
2. This drawing is to be read in conjunction with all relevant Engineers' and Service Engineers' drawings and specifications.

Legend

- HydrocBorehole
- HydrocTrial Pit
- HydrocWindow SamIer Borehole
- HydrocHand Dug Trial Pit

Key

- Site Boundary
- BPA Oil Pipeline
- UG - BT Cable
- Anglian - Surface Drainage
- Anglian - Foul Drainage
- Anglian - Distribution Main
- Instalcom - Misc. Cable
- BSkyB - Sky Cable
- NGG - Medium Pressure Gas
- NGG - Low Pressure Gas
- WPD - LV - UG Cable
- WPD - HV - OH Cable
- WPD - HV - UG Cable

Rev	Date	Description	By	C: d
H	09/02/18	Site Boundary Updated	NS	AB
G	04/07/17	Courtenhall Estates land added	RB	AB
F	02/06/17	Further works at Rathvilly Farm added	RB	AB
E	23/02/17	Works at Rathvilly Farm added	RB	AB
D	05/01/17	Further revised, land parcel and geological information removed	RB	AB
C	02/09/16	Proposed works in inaccessible land parcels added	SD	AB
B	17/08/16	Geological information added	RB	AB
A	10/08/16	Land Parcel information added	SD	RB

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Client :

ASHFIELD LAND

Project Title:

RAIL CENTRAL
MILTON MALSOR
NORTHAMPTONSHIRE

Drawing Title:

Exploratory Hole Location Plan

Drawing Status:

INFORMATION

Hydrock Job No:

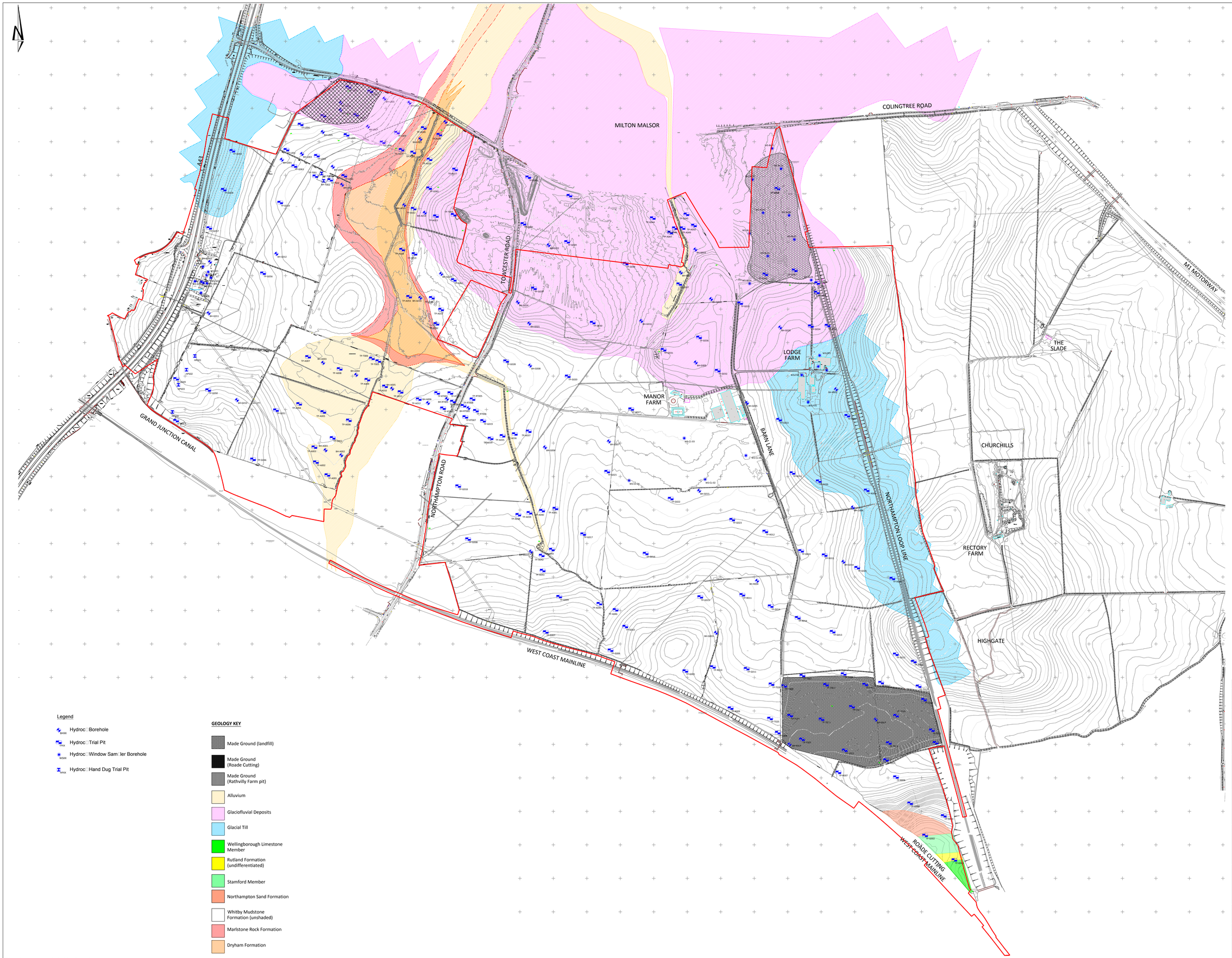
C/151171

Drawn	Checked	Scale @ A0	Date	Issue Date
NS	AB	1:3500	09/02/18	09/02/18

Drawing Number: 151171/D004

Revision: H

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Notes:

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2. This drawing is to be read in conjunction with all relevant Engineers' and Service Engineers' drawings and specifications.

Legend

- Hydroc Borehole
- Hydroc Trial Pit
- Hydroc Window Sam ler Borehole
- Hydroc Hand Dug Trial Pit

GEOLOGY KEY

- Made Ground (landfill)
- Made Ground (Roade Cutting)
- Made Ground (Rathvilly Farm pit)
- Alluvium
- Glaciofluvial Deposits
- Glacial Till
- Wellingborough Limestone Member
- Rutland Formation (undifferentiated)
- Stamford Member
- Northampton Sand Formation
- Whitby Mudstone Formation (unshaded)
- Marlstone Rock Formation
- Dryham Formation

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Rev	Date	Description	By	Ch'd
C	09/02/18	Site Boundary Updated	NS	AB
B	06/07/17	Updated following fieldworks	RB	AB
A	15/02/17	Updated following fieldworks	RB	AB

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Client:

ASHFIELD LAND

Project Title:

RAIL CENTRAL
MILTON MALSOR
NORTHAMPTONSHIRE

Drawing Title:

Site Geology Plan

Drawing Status:

INFORMATION

Hydrock Job No:

C/151171

Drawn	Checked	Scale @ A0	Date	Last Date
NS	AB	1:3500	09/02/18	09/02/18

Drawing Number: 151171/D005

Revision: C

Notes:

1. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.
2. This drawing is to be read in conjunction with all relevant Engineers' and Service Engineers' drawings and specifications.

MILTON MALSOR
COLINGTREE ROAD
A43
TOWCESTER ROAD
GRAND JUNCTION CANAL
NORTHAMPTON ROAD
SOUTHERN EXTENT OF GLACIOFLUVIAL DEPOSITS
MANOR FARM
LODGE FARM
BARN LANE
THE SLADE
CHURCHILLS
RECTORY FARM
HIGHGATE
NORTHAMPTON LOOP LINE
WEST COAST MAINLINE
ROADE CUTTING
M1 MOTO

Legend

- Hydroc Borehole
- Hydroc Trial Pit
- Hydroc Window Sam ler Borehole
- Hydroc Hand Dug Trial Pit

ZONING KEY

- Made Ground (landfill)
- Made Ground (Roade Cutting)
- Made Ground (Rathvilly Farm pit)
- Made Ground (other, filling station, farms)
- Alluvium
- Southern extent of Glaciofluvial Deposits
- Development platform areas
- Area of cut
- Area of fill
- Site Boundary

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Rev	Date	Description	By	Ch'd
B	09/02/18	Site Boundary Updated	NS	AB
A	06/07/17	Updated following additional works	RB	AB

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Client :

ASHFIELD LAND

Project Title:

RAIL CENTRAL
MILTON MALSOR
NORTHAMPTONSHIRE

Drawing Title:

Site Zonation Plan

Drawing Status:

INFORMATION

Hydrock Job No:

C/151171

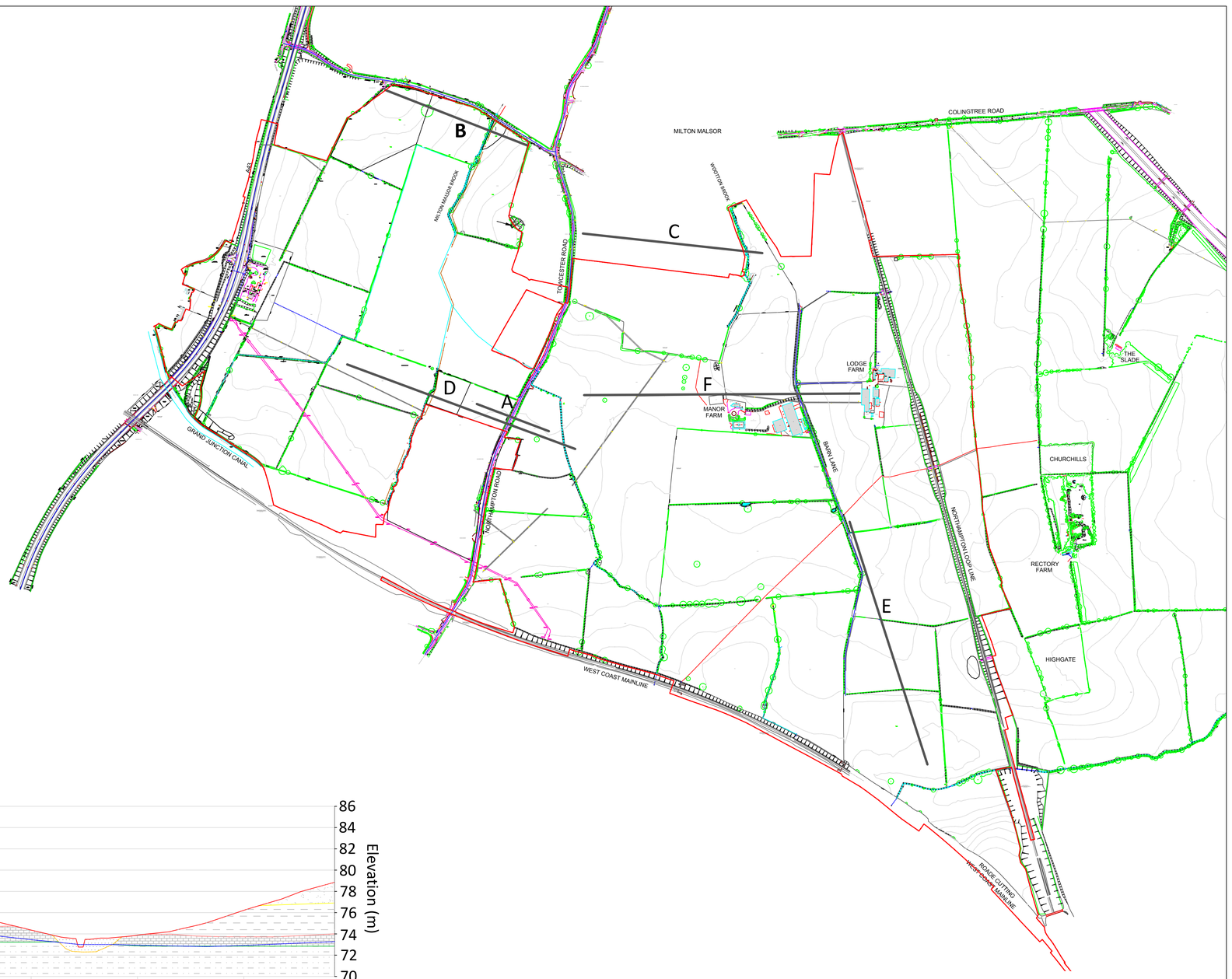
Drawn	Checked	Scale @ A0	Date	Issue Date
NS	AB	1:3500	09/02/18	09/02/18

Drawing Number: 151171/D006

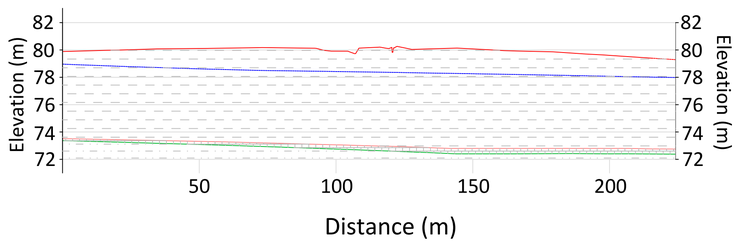
Revision: B

KEY

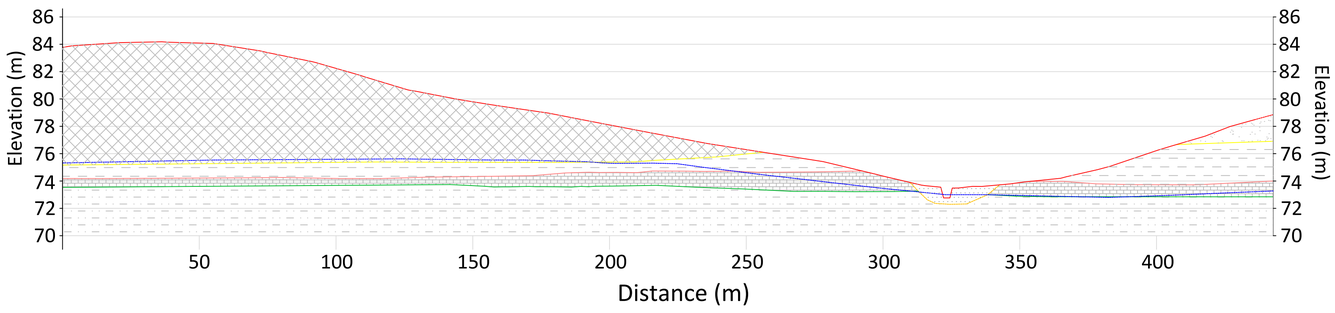
- Existing Ground Level
- Water Table
- Base Glaciofluvial
- Base Alluvium
- Base Till
- Base Whitby
- Base Marlstone
- Made Ground
- Alluvium Deposits
- Glaciofluvial Deposits
- Glacial Till
- Whitby Mudstone Formation
- Marlstone Rock Formation
- Dyrham Formation



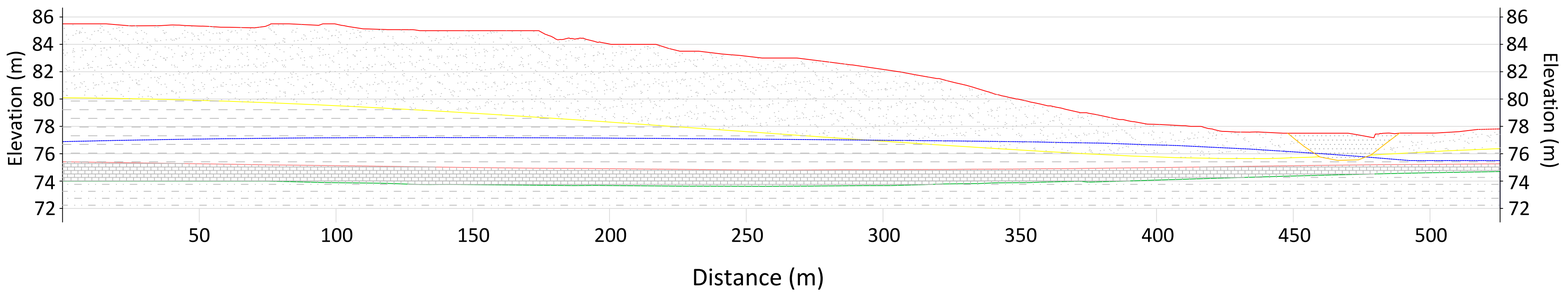
A PROFILE



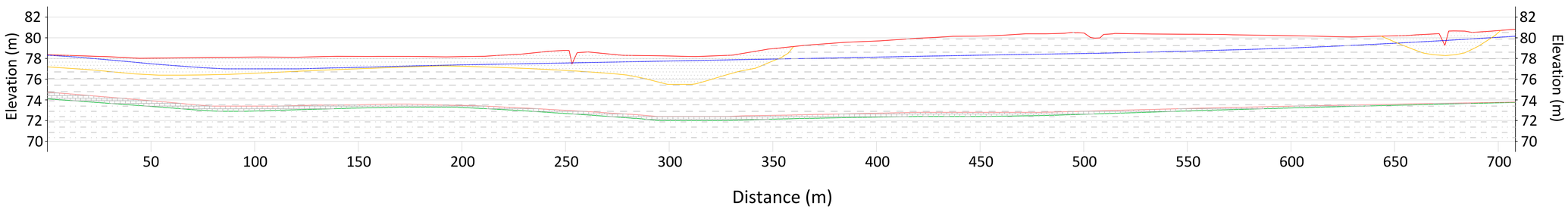
B PROFILE



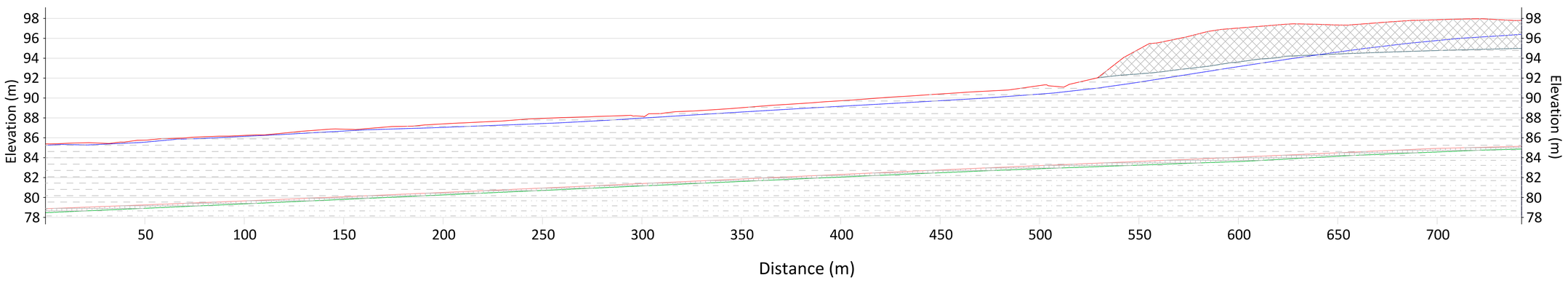
C PROFILE



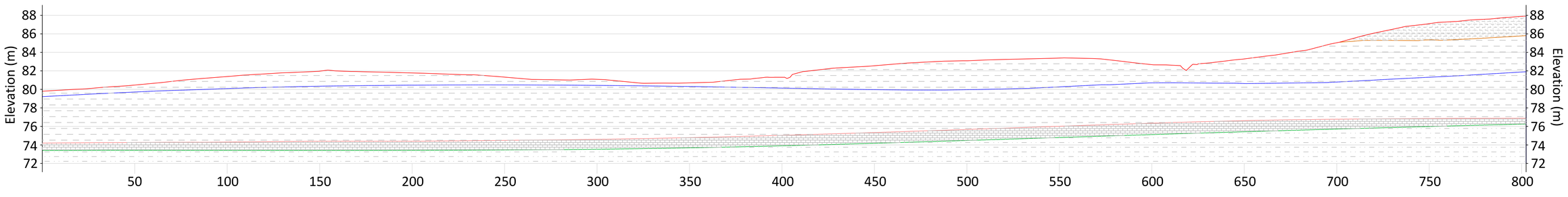
D PROFILE



E PROFILE



F PROFILE



KEY PLAN

NOTES

1. The cross sections above are displayed at 5 times vertical exaggeration.

REVISIONS

P01	FIRST ISSUE						
	N STURMAN	17/02/17					
P02	UPDATED SITE BOUNDARY						
	N STURMAN	09/02/18					

TITLE: Interpretative Cross Sections

HYDROCK PROJECT NO.: C151171

SCALE @ A0: H - 1:1100 V - 1:5

PURPOSE OF ISSUE: SUITABLE FOR CO-ORDINATION

STATUS: S1

DRAWING NO. (PROJECT - ORIGINATOR - VOLUME - LEVEL - TYPE - ROLE - NUMBER): C151171.D007

REVISION: P02

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CLIENT: ASHFIELD LAND

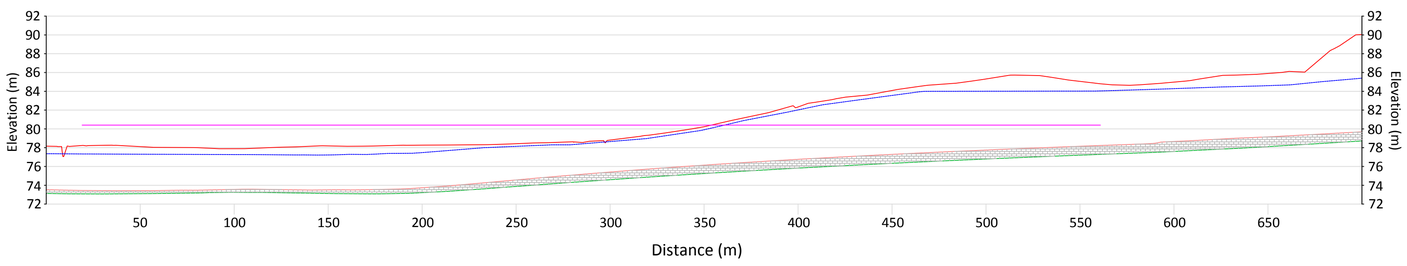
PROJECT: Rail Central, Milton Malsor

KEY

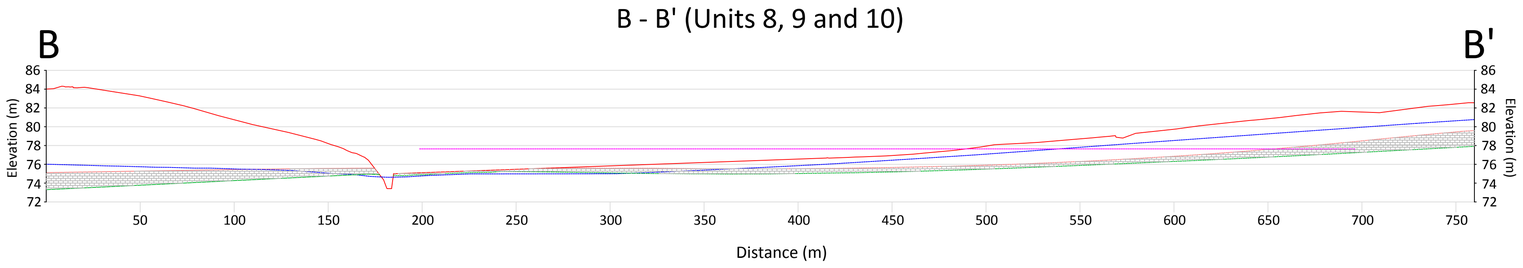
- Existing Ground Level
- Water Table
- Base Whitby
- Base Marlstone
- Unit Plateau Level
- Marlstone Rock Formation

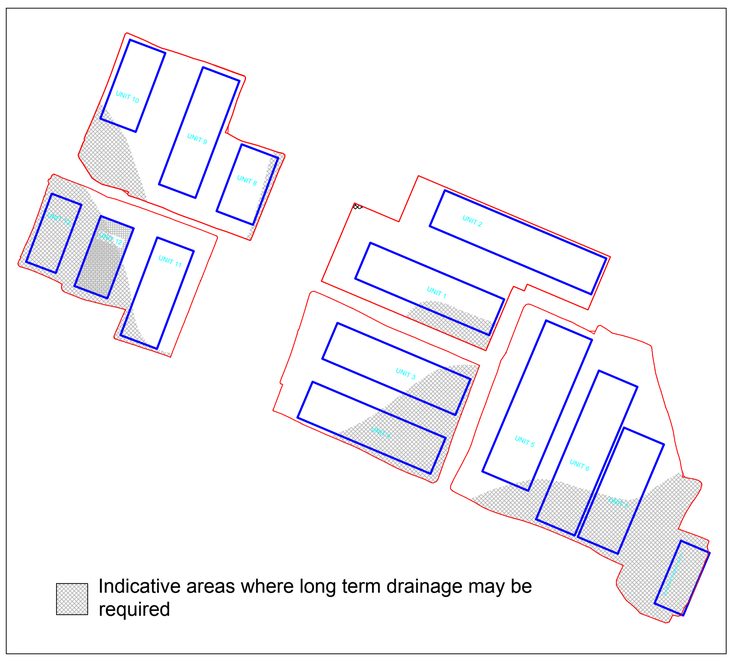


A - A' (Units 11, 12 and 13)

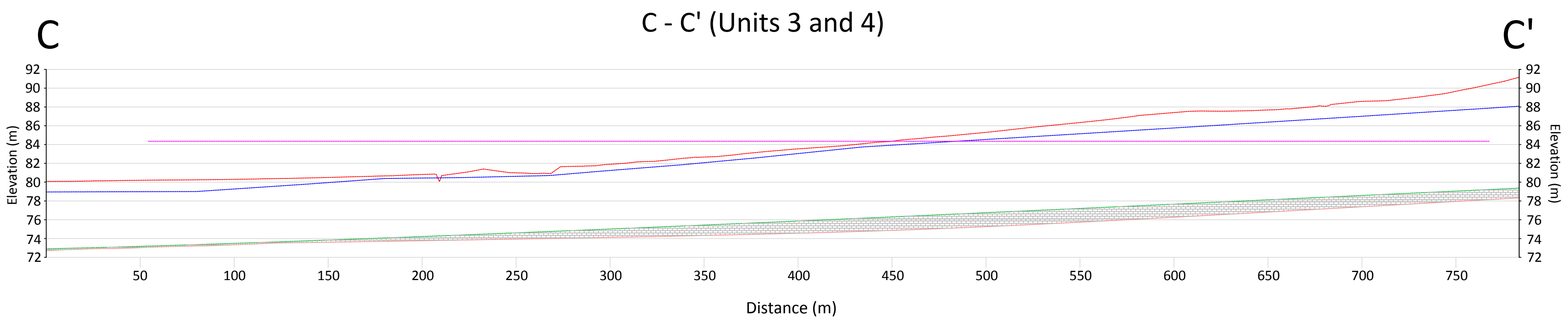


B - B' (Units 8, 9 and 10)

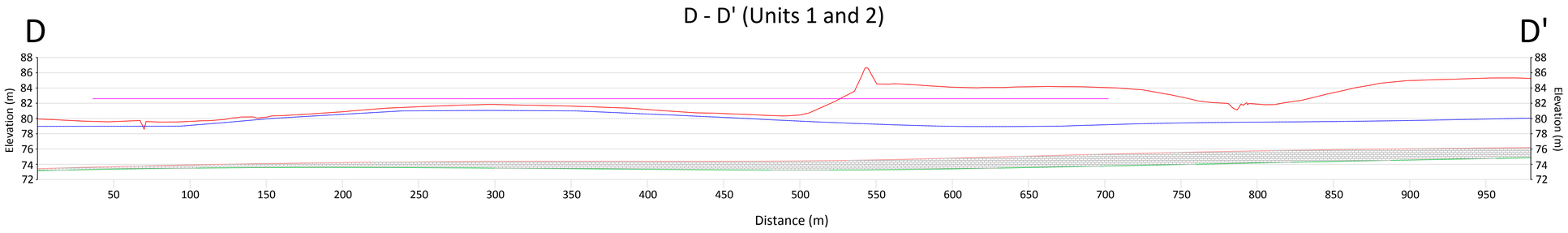




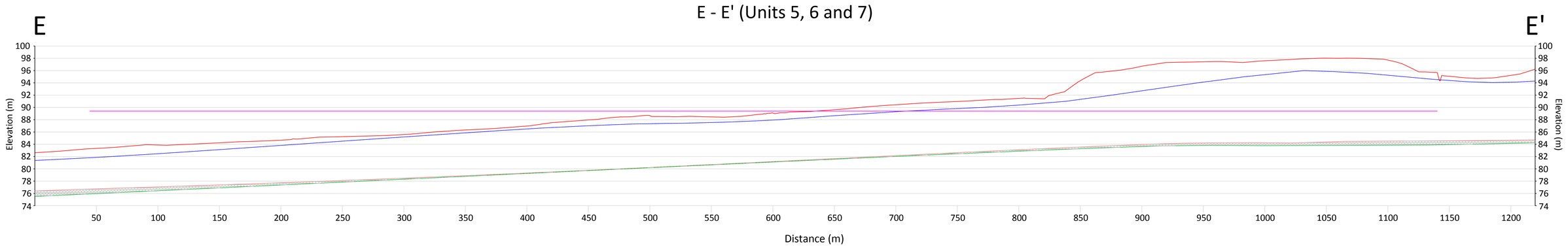
C - C' (Units 3 and 4)



D - D' (Units 1 and 2)



E - E' (Units 5, 6 and 7)



KEY PLAN

NOTES

1. The cross sections above are displayed at 5 times vertical exaggeration.

REVISIONS

P01	FIRST ISSUE						
	N STURMAN	17/02/17					
P02	UPDATED SITE BOUNDARY						
	N STURMAN	09/02/18					

TITLE

Groundwater level at development plateaus (Jan/Feb 2017)

HYDROCK PROJECT NO.: C151171

SCALE @ A0: H - 1:1600 V - 1:5

PURPOSE OF ISSUE: SUITABLE FOR CO-ORDINATION

STATUS: S1

DRAWING NO. (PROJECT - ORIGINATOR - VOLUME - LEVEL - TYPE - ROLE - NUMBER): C151171.D008

REVISION: P02

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CLIENT: ASHFIELD LAND

PROJECT: Rail Central, Milton Malsor

Appendix B

Exploratory Hole Logs

Hydrock www.hydrock.com

Cable Percussion

Borehole No. BHA001

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472621E, 254579N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	79.70m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	01/09/16 - 02/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30-1.20	B		0.30	79.40		Topsoil (driller's description) (TOPSOIL)
		1.20	SPT	N=10 (2,3/2,2,3,3)				Firm light brown slightly sandy CLAY with some mudstone fragments and rounded to subrounded fine to coarse flint gravel. (ALLUVIUM)
		1.70-2.00	B					
	▼	2.00	SPT	N=20 (3,3/4,5,5,6)	2.10	77.60		Stiff extremely closely fissured bluish grey mottled greenish grey CLAY with fossil remains. (WHITBY MUDSTONE FORMATION)
		2.90-3.40	D		2.90	76.80		Weak light brown LIMESTONE. (MARLSTONE FORMATION)
	▼				3.40	76.30		Very stiff greenish grey mottled bluish grey CLAY with frequent fossil remains. (DYRHAM FORMATION)
		4.00	SPT	N=40 (9,10/11,10,9,10)				
		5.00-5.40	B		5.00	74.70		Moderately weak grey MUDSTONE (DYRHAM FORMATION)
	▼	5.00	SPT	N≥50 (25 for 75mm/52 for 75mm)				
		5.50	SPT	N≥50 (25 for 75mm/69 for 75mm)	5.65	74.05		End of Borehole at 5.65m

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Groundwater struck at 2.40m rising to 2.00m after 20 minutes with 2.10m of casing. Sealed off at 2.80m. Chiselled from 3.00m to 3.40m for 1.00 hour. Groundwater struck at 5.40m rising to 3.20m after 20 minutes with 5.20m of casing. 6. Chiselled from 5.00m to 5.50m for 1.50 hours.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHA002

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472667E, 254561N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	79.92m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	01/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.20-0.60	B		0.20	79.72		Firm light brown CLAY with rare rootlets. (TOPSOIL)
								Firm light grey mottled reddish brown CLAY. (ALLUVIUM)
		1.00	D					
		1.20-1.65	B		1.20	78.72		
		1.20	SPT	N=7 (1,1/1,2,2,2)				Firm bluish grey mottled orange-brown CLAY with rare subangular medium sized fragments of mudstone. (WHITBY MUDSTONE FORMATION)
		2.00	D					
		2.00-2.45	U	30 Blows (100% rec)	2.30	77.62		
		2.50-3.00	B					Stiff thickly laminated extremely closely fissured bluish grey mottled dark grey CLAY with occasional fossil remains. (WHITBY MUDSTONE FORMATION)
		3.00	D					
		3.00-3.45	B					
		3.00	SPT	N=15 (3,3/3,4,4,4)				
		4.00	D					
		4.00-4.45	U	81 Blows	4.10	75.82		Grey LIMESTONE recovered as angular and subangular fine to coarse sized limestone fragments. (MARLSTONE FORMATION)
		4.50-5.00	B		4.50	75.42		Stiff grey CLAY. (DYRHAM FORMATION)
		5.00	D					
		5.00-5.45	B					
		5.00	SPT	N=20 (3,4/4,5,5,6)				
		6.00	D		6.00	73.92		Weak grey MUDSTONE. (DYRHAM FORMATION)
		6.40	SPT	N≥50 (9,15/50 for 204mm)				
					6.75	73.17		End of Borehole at 6.75m

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. No groundwater encountered. 3. Borehole cased to 5.00m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

Hydrock www.hydrock.com

Cable Percussion

Borehole No. BHA003

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472612E, 254840N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	78.08m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	23/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.20	D		0.20	77.88		Brown silty clay topsoil (driller's description). (TOPSOIL)
		0.30-0.70	B					Firm brown CLAY with many rootlets. (ALLUVIUM)
		0.70-1.00	B		0.70	77.38		Brown clayey gravelly SAND. Gravel is subangular to subrounded fine to coarse sized flint and mudstone. (ALLUVIUM)
					1.00	77.08		
		1.15	D					Soft yellow brown slightly sandy CLAY with thin laminae of grey clay. (ALLUVIUM)
	▼	1.20-1.65	UT	27 Blows (100% rec)				
		1.50	W		1.65	76.43		Stiff light grey mottled brown CLAY with occasional subangular fine to medium sized mudstone fragments and fossils. (WHITBY MUDSTONE FORMATION)
		1.65-1.80	D					
		2.10	D		2.10	75.98		Stiff greenish grey mottled bluish grey CLAY with frequent angular and subangular fine to coarse sized mudstone fragments. (WHITBY MUDSTONE FORMATION)
	▼	2.25	SPT	N=33 (2,2/3,4,12,14)				
		3.00	D					
		3.20-3.65	UT	41 Blows (100% rec)				
		3.65-3.80	D					
	▽				4.10	73.98		Moderately weak dark grey MUDSTONE. (WHITBY MUDSTONE FORMATION)
		4.30	D					
		4.40	D		4.40	73.68		Hard dark grey slightly sandy CLAY with occasional angular and subangular fine to medium sized mudstone fragments. (WHITBY MUDSTONE FORMATION)
		4.50	SPT	N≥50 (25 for 135mm/50 for 239mm)				
		5.00	D		4.85	73.23		Moderately weak grey LIMESTONE. (MARLSTONE FORMATION)
					5.30	72.78		Hard dark grey slightly sandy CLAY with occasional angular and subangular fine to medium sized mudstone fragments. (DYRHAM FORMATION)
		5.55	SPT	N≥50 (7,5/50 for 295mm)				
					6.00	72.08		Hard dark grey sandy CLAY with occasional angular and subangular fine to medium sized mudstone fragments, sand pockets and fossil remains. (DYRHAM FORMATION)
		6.10	D					
		7.00	D					
		7.05	SPT	N≥50 (5,11/50 for 182mm)				
		8.00	D					
		8.40	D					
		8.55	SPT	N≥50 (25 for 86mm/50 for 61mm)	8.55	69.53		Moderately weak yellow grey mottled dark grey LIMESTONE with frequent fossil remains. (DYRHAM FORMATION)
					8.72	69.36		End of Borehole at 8.72m

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Groundwater struck at 2.60m, no rise in 20 minutes, 1.50m of casing. 3. Groundwater struck at 4.10m rising to 1.50m after 20 minutes wuth 3.00m of casing. 4. Chiselled from 4.10m to 4.40m for 0.85 hour. 5. Chiselled from 4.85m to 5.30m for 1.50 hours. 6. Chiselled from 8.40m to 8.55m for 0.50 hour. 7. Borehole cased to 8.50m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHA004

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472711E, 254804N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	78.12m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	24/08/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.20	D		0.20	77.92		Brown stiff silty clay topsoil and rootlets (driller's description). (TOPSOIL)
		0.30-0.60	B					
		0.60-0.80	B					Firm brown CLAY with frequent angular to subangular fine to coarse gravel of flint and mudstone and frequent rootlets. (ALLUVIUM)
					0.80	77.32		
		1.00	D					Firm orange-brown mottled grey CLAY with occasional mudstone lithorelicts up to 30mm. (WHITBY MUDSTONE FORMATION)
		1.20-1.65	UT	9 Blows (100% rec)				
					1.80	76.32		Stiff fissured grey and light grey CLAY with frequent gypsum crystals. (WHITBY MUDSTONE FORMATION)
		2.00	D					
		2.20	SPT	N=15 (2,2/3,3,4,5)				
		2.45	W					
		3.20	D		3.20	74.92		Moderately weak very thinly bedded grey MUDSTONE with orange-brown staining along bedding planes. (WHITBY MUDSTONE FORMATION)
		3.20-3.65	UT	50 Blows				
		3.50	D		3.60	74.52		Very stiff very closely fissured grey CLAY with rare mudstone lithorelicts up to 30mm and fossil remains. (WHITBY MUDSTONE FORMATION)
		4.00	D					
		4.20-4.60	B					
		4.20-4.65	UT	50 Blows				
					4.55	73.57		Moderately weak grey LIMESTONE. (MARLSTONE FORMATION)
		4.65	D		4.75	73.37		
		4.70	D					Hard very closely sheared dark grey CLAY. (DYRHAM FORMATION)
		4.75	SPT	N≥50 (7,7/50 for 247mm)				
		5.50	D					
		5.90	SPT	N≥50 (5,12/50 for 58mm)	5.90	72.22		Extremely weak very thinly bedded bluish grey MUDSTONE. (DYRHAM FORMATION)
		6.60	SPT	N≥50 (25 for 10mm/50 for 10mm)	6.62	71.50		End of Borehole at 6.62m

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Groundwater struck at 3.50m rising to 2.45m after 20 minutes with 3.45m of casing. 3. Chiselled from 3.35m to 3.60m for 0.75 hour. 4. Chiselled from 5.60m to 5.80m for 0.50 hour. 5. Chiselled from 6.30m to 6.60m for 1.50 hour. 7. Groundwater struck at 6.50m rising to 1.67m after 20 minutes with 6.45m of casing. 7. Borehole cased to 6.60m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHA005

Sheet 1 of 2

Project Name:	Rail Central		**Co-ords:**	472818E, 254763N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	78.21m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	25/08/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.20-1.20	B		0.20	78.01		Topsoil (driller's description) (TOPSOIL)
								Firm orange-brown mottled light brown CLAY with occasional rootlets. (ALLUVIUM)
		1.20-1.65	U	10 Blows (100% rec)	1.20	77.01		Soft light grey mottled orange-brown sandy CLAY with frequent subangular to subrounded medium to coarse gravel of mudstone. (ALLUVIUM)
		1.65-1.80	D					
		1.80-2.45	B					
		2.00	SPT	N=6 (1,2/2,1,2,1)				
		3.00	SPT	N=17 (4,3/4,5,4,4)				
					3.20	75.01		Stiff extremely closely fissured dark grey CLAY. (WHITBY MUDSTONE FORMATION)
		4.00	SPT	N≥50 (25 for 75mm/71 for 125mm)	4.00	74.21		Hard extremely closely fissured dark grey CLAY with frequent subangular and angular fine to coarse sized mudstone fragments and fossil remains. (WHITBY MUDSTONE FORMATION)
		5.00	SPT	N≥50 (9,10/12,14,13,12)				
		5.60-6.00	B					
		6.00	SPT	N≥50 (10,15/67 for 225mm)	6.00	72.21		Moderately weak grey LIMESTONE. (MARLSTONE FORMATION)
					6.40	71.81		Hard very closely fissured dark grey sandy CLAY. (DYRHAM FORMATION)
		7.00	SPT	N≥50 (10,12/16,12,13,13)				
		8.00	SPT	N≥50 (10,10/12,12,13,13)				
		8.50-9.00	B					
		9.00	SPT	N=44 (12,10/11,10,11,12)	9.00	69.21		Very stiff dark grey sandy CLAY. (DYRHAM FORMATION)
		10.00	SPT	N=49 (11,11/11,12,12,14)	10.00	68.21		

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Groundwater struck at 2.40m rising to 1.50m after 20 minutes with 2.00m of casing. Sealed off at 3.20m. 3. Chiselled from 4.00m to 4.30m for 1.00 hour. 4. Groundwater struck at 6.00m rising to 1.80m after 20 minutes with 5.80m of casing. Sealed off at 7.00m. 5. Chiselled from 6.20m to 6.50m for 1.00 hour. 6. Borehole cased to 7.00m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHA005

Sheet 2 of 2

Project Name:	Rail Central		**Co-ords:**	472818E, 254763N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	78.21m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	25/08/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
					10.45	67.76		Very stiff extremely closely fissured greenish grey mottled dark grey CLAY. (DYRHAM FORMATION) End of Borehole at 10.45m

11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
19.0
20.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Groundwater struck at 2.40m rising to 1.50m after 20 minutes with 2.00m of casing. Sealed off at 3.20m. 3. Chiselled from 4.00m to 4.30m for 1.00 hour. 4. Groundwater struck at 6.00m rising to 1.80m after 20 minutes with 5.80m of casing. Sealed off at 7.00m. 5. Chiselled from 6.20m to 6.50m for 1.00 hour. 6. Borehole cased to 7.00m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHA006

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472925E, 254719N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	80.02m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	31/08/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20-0.60	B		0.20	79.82		Firm brown sandy clay (driller's description). (TOPSOIL)
								Firm orange-brown mottled bluish grey CLAY with frequent subangular fine to coarse mudstone fragments. (WHITBY MUDSTONE FORMATION)
		1.00	D					
		1.20-1.65	B					
		1.20	SPT	N=14 (1,2/3,3,4,4)				
		2.00	D					
		2.00-2.45	U	29 Blows (100% rec)				
		2.50-3.00	B		2.50	77.52		Firm very thinly bedded dark grey CLAY with some orange-brown mudstone fragments. (WHITBY MUDSTONE FORMATION)
		3.00	D					
		3.00-3.45	B					
		3.00	SPT	N=11 (1,1/2,2,3,4)				
		4.00	D					
		4.00-4.45	U	45 Blows (100% rec)				*.. Below 4.00m, becomes stiff.*
		4.50	B					
		5.00	D		5.00	75.02		Hard extremely closely fissured CLAY with light grey silt along fissure planes in places. (WHITBY MUDSTONE FORMATION)
		5.00-5.45	B					
		5.00	SPT	N=49 (3,5/7,10,15,17)				
		6.50	SPT	N≥50 (6,6/50 for 280mm)				
					6.93	73.09		End of Borehole at 6.93m

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. No groundwater encountered. 3. Chiselled from 7.00m to 7.40m for 1.00 hour. 4. Borehole cased to 5.00m at 150mm diameter. 5. Borehole backfilled with arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHA010

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472902E, 255034N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	77.40m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	16/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.20-0.60	B		0.20	77.20		Firm brown clay (driller's description). (TOPSOIL)
								Firm dark brown CLAY with occasional angular to subangular medium to coarse gravel of mixed lithologies. (ALLUVIUM)
		1.00	D					
		1.20-1.65	B		1.20	76.20		
		1.20	SPT	N=20 (2,3/4,5,5,6)				Stiff dark grey mottled yellow-brown CLAY. (DYRHAM FORMATION)
		2.00	D		2.00	75.40		
		2.00-2.45	B					Very stiff dark grey CLAY. (DYRHAM FORMATION)
		2.00	SPT	N=38 (7,10/8,6,9,15)				
					2.80	74.60		
		3.00	SPT	N≥50 (25 for 50mm/50 for 60mm)	3.11	74.29		Very weak dark brown MUDSTONE. (DYRHAM FORMATION)
								End of Borehole at 3.11m

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. No groundwater encountered. 3. Chiselled from 2.80m to 3.00m for 1.00 hour.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHA013

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472854E, 255305N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	75.90m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	19/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.20-0.60	B		0.20	75.70		Firm brown clay (driller's description). (TOPSOIL)
								Firm orange-brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium sized mudstone and chert. (ALLUVIUM)
		1.00	D					.. *Occasional rootlets to 0.90m.*
		1.20-1.65	B					
		1.20	SPT	N=14 (2,2/3,3,4,4)				
		2.00	D		2.00	73.90		
		2.00-2.45	U	32 Blows (100% rec)				Stiff orange-brown and grey calcareous CLAY with occasional subangular fine to coarse sized mudstone fragments and silt sized gypsum crystals. (DYRHAM FORMATION)
		2.50-3.00	B					
		3.00	D		3.00	72.90		
		3.00-3.45	B					Stiff brownish grey and grey slightly sandy calcareous CLAY with frequent angular mudstone fragments and sand sized gypsum crystals. (DYRHAM FORMATION)
		3.00	SPT	N=23 (3,4/5,6,6,6)				
		4.00	D					
		4.00-4.45	U	39 Blows (100% rec)				
		4.50-5.00	B					
		5.00	D					
		5.00-5.45	B					
		5.00	SPT	N=34 (6,7/8,8,9,9)				
		6.00	D		6.00	69.90		
		6.00	SPT	N≥50 (10,14/50 for 70mm)	6.22	69.68		Moderately weak grey LIMESTONE. (DYRHAM FORMATION)
								End of Borehole at 6.22m

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. No groundwater encountered. 3. Chiselled from 6.00m to 6.20m for 0.50 hour. 4. Borehole cased to 1.00m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: MOB **Checked:** RB

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Cable Percussion

Borehole No. BHA014

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472916E, 255284N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	80.34m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	20/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.20-0.60	B		0.20	80.14		Firm brown clay (driller's description). (TOPSOIL)
					0.80	79.54		Firm brown slightly sandy slightly gravelly CLAY with occasional rootlets. Gravel is subrounded to subangular fine to medium sized mudstone and chert. (GLACIOFLUVIAL DEPOSITS)
		1.00	D					
		1.20-1.65	B					Firm light brownish grey and orange-brown CLAY. (GLACIOFLUVIAL DEPOSITS)
		1.20	SPT	N=10 (2,2/3,2,3,3)				
					1.60	78.74		Soft orange-brown sandy CLAY. (GLACIOFLUVIAL DEPOSITS)
		2.00	D					
		2.00-2.45	U	27 Blows (100% rec)				
		2.50-3.00	B		2.50	77.84		Medium dense orange-brown clayey sandy GRAVEL of subangular and angular fine to coarse sized limestone and ironstone. (GLACIOFLUVIAL DEPOSITS)
		3.00	D		3.00	77.34		
		3.00-3.45	B					Stiff thickly laminated grey and orange-brown CLAY with occasional subangular fine to coarse sized mudstone fragments. (WHITBY MUDSTONE FORMATION)
		3.00	SPT	N=16 (3,4/3,4,4,5)				
		4.00	D					
		4.00-4.45	B					
		4.00	SPT	N=27 (5,6/6,7,7,7)				
		5.00	D					
		5.00-5.45	B					
		5.00	SPT	N=31 (5,6/7,8,8,8)				
		6.00	D		6.00	74.34		Very stiff thickly laminated grey calcareous CLAY with occasional laminations of light grey silt and frequent fossil shells (<1mm). (WHITBY MUDSTONE FORMATION)
		6.50-6.95	B					
		6.50	SPT	N=47 (7,7/9,12,12,14)				
		7.00	D					*.. Below 7.00m, with occasional mudstone lithorelicts and silt sized gypsum crystals.*
		8.00	D		8.00	72.34		Hard thickly laminated greenish grey CLAY with frequent echinoderm fossils between 2-15mm. (WHITBY MUDSTONE FORMATION)
		8.00-8.45	B					
		8.00	SPT	N≥50 (6,8/10,11,13,16)				
		9.00	D					
		9.50	SPT	N≥50 (25 for 59mm/50 for 65mm)	9.62	70.72		End of Borehole at 9.62m

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. No groundwater encountered. 3. Chiselled from 9.40m to 9.50m for 0.50 hour. 4. Borehole cased to 2.00m at 150mm diameter. 5. Borehole backfilled with arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: MOB **Checked:** RB

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Cable Percussion

Borehole No. BHA015

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472903E, 255508N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	73.56m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	12/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.20-0.60	B		0.20	73.36		Firm brown clay (driller's description). (TOPSOIL)
								Soft light grey mottled light brown CLAY with abundant gravel of mixed lithologies. (ALLUVIUM)
		1.00	D					
		1.20-1.65	B					
		1.20	SPT	N=8 (1,1/1,2,3,2)				
		2.00	D					
		2.00-2.45	U	30 Blows (100% rec)				
		2.50-3.00	B		2.50	71.06		Firm greenish grey mottled bluish grey slightly sandy CLAY with occasional gypsum crystals. (DYRHAM FORMATION)
		3.00	D					
		3.00-3.45	B					*.. Below 3.00m, becoming very closely fissured.*
		3.00	SPT	N=13 (2,2/3,3,3,4)				
		4.00	D		4.00	69.56		Stiff very closely fissured bluish grey slightly sandy CLAY with frequent mudstone lithorelicts. (DYRHAM FORMATION)
		5.00-5.45	B					*.. Below 5.00m, with occasional fragments of mudstone.*
		5.00	SPT	N=23 (3,5/6,5,6,6)				
		6.00	D					
		6.50-6.95	B					*.. Below 6.50m, becoming hard.*
		6.50	SPT	N≥50 (8,8/10,9,10,22)				
					7.20	66.36		End of Borehole at 7.20m

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Groundwater struck at 3.00m rising to 1.50m after 20 minutes with 3.00m of casing. 3. Chiselled from 7.00m to 7.20m for 0.50 hour. 4. Borehole cased to 6.00m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHG001

Sheet 1 of 2

Project Name:	Rail Central		**Co-ords:**	474265E, 253761N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	97.80m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	30/08/16 - 31/08/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.30-1.20	B		0.30	97.50		Topsoil (driller's description) (MADE GROUND)
		1.20	SPT	N=14 (5,6/4,3,3,4)				Firm greyish brown sandy gravelly CLAY with occasional cobbles. Gravel is angular to subrounded fine to coarse mudstone, limestone and occasional brick and timber. Cobbles are limestone. (MADE GROUND)
		1.50-2.00	B					
	▽	2.00	SPT	N=19 (3,4/3,4,5,7)				
		3.00-3.50	B					
	▽	3.00	SPT	N=34 (7,17/10,17,3,4)	3.20	94.60		Stiff very closely fissured dark grey mottled orange-brown CLAY. (WHITBY MUDSTONE FORMATION)
		4.00	SPT	N=16 (3,4/5,4,3,4)				
		4.20-5.00	B					
		5.00-5.45	U	39 Blows				
		5.60	SPT	N=38 (8,8/8,9,10,11)				
	▽	7.00	SPT	N=43 (9,10/11,10,11,11)				
		8.00	SPT	N=47 (10,12/11,12,12,12)				
	▽				8.40	89.40		Very stiff in places extremely closely fissured grey CLAY with frequent gypsum crystals and light grey silt along fissure planes in places. (WHITBY MUDSTONE FORMATION)
		9.00	SPT	N≥50 (10,13/12,13,13,12)				*.. Becoming hard below approximately 9.00m.*
		9.50-10.00	B					
		10.00	SPT	N≥50 (10,12/13,14,15,16)				

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Chiselled from 3.10m to 3.50m for 1.00 hour. 3. Groundwater struck at 3.40m rising to 2.10m after 20 mins with 3.00m of casing. Sealed off at 3.80m. 4. Groundwater struck at 8.40m rising to 6.10m after 20 mins with 8.00m of casing. Sealed off at 9.00m. 6. borehole cased to 9.00m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHG001

Sheet 2 of 2

Project Name:	Rail Central		**Co-ords:**	474265E, 253761N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	97.80m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	30/08/16 - 31/08/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
					10.45	87.35		Very stiff in places extremely closely fissured grey CLAY with frequent gypsum crystals and light grey silt along fissure planes in places. (WHITBY MUDSTONE FORMATION)
								End of Borehole at 10.45m

11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
19.0
20.0

Remarks:

1. Excavate hand dug inspection pit to 1.20m. 2. Chiselled from 3.10m to 3.50m for 1.00 hour. 3. Groundwater struck at 3.40m rising to 2.10m after 20 mins with 3.00m of casing. Sealed off at 3.80m. 4. Groundwater struck at 8.40m rising to 6.10m after 20 mins with 8.00m of casing. Sealed off at 9.00m. 6. borehole cased to 9.00m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHG002

Sheet 1 of 2

Project Name:	Rail Central		**Co-ords:**	473786E, 254033N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	93.50m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	06/10/16 - 07/10/16	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20	93.30		Topsoil (driller's description) (TOPSOIL)
		0.50	D					Firm grey and orange-brown CLAY with occasional rootlets. (WHITBY MUDSTONE FORMATION)
		1.00	D					
		1.50	D					
		1.50	SPT	N=10 (1,1/1,2,2,5)				
		2.50-2.95	UT	35 Blows (90% rec)				
		3.00	D		3.00	90.50		Stiff grey mottled brown CLAY with some silt and sand grade gypsum crystals. (WHITBY MUDSTONE FORMATION)
		3.50	SPT	N=12 (1,2/2,3,4,3)				
		4.50-4.95	UT	30 Blows (95% rec)				
		5.00	D		5.00	88.50		Stiff thinly laminated brownish grey locally orange-brown CLAY with occasional gypsum crystals. (WHITBY MUDSTONE FORMATION)
		5.50	SPT	N=21 (2,2/4,4,5,8)				
		6.50	D					*.. Below 6.50m, laminations absent.*
		7.00-7.45	U	45 Blows (100% rec)				
		7.50	D		7.50	86.00		Very stiff thinly laminated grey in places orange-brown CLAY with occasional angular and subangular fine to medium sized ironstone gravel and sand sized gypsum crystals. (WHITBY MUDSTONE FORMATION)
	▼	8.00	D					
	▽	8.50	SPT	N=40 (2,3/7,9,11,13)				
		9.50	D					
		10.00	SPT	N≥50 (3,6/9,14,15,20)				

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Groundwater struck at 8.50m rising to 8.00m after 20 minutes with 1.50m of casing. 3. Borehole cased to 1.50m at 150mm diameter. 4. Borehole backfilled with arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: MOB **Checked:** RB

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Cable Percussion

Borehole No. BHG002

Sheet 2 of 2

Project Name:	Rail Central		**Co-ords:**	473786E, 254033N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	93.50m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	06/10/16 - 07/10/16	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
					10.45	83.05		Very stiff thinly laminated grey in places orange-brown CLAY with occasional angular and subangular fine to medium sized ironstone gravel and sand sized gypsum crystals. (WHITBY MUDSTONE FORMATION)
								End of Borehole at 10.45m

11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
19.0
20.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Groundwater struck at 8.50m rising to 8.00m after 20 minutes with 1.50m of casing. 3. Borehole cased to 1.50m at 150mm diameter. 4. Borehole backfilled with arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: MOB **Checked:** RB

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Cable Percussion

Borehole No. BHG003 Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	473233E, 254276N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	84.40m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	05/10/16 - 06/10/16	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.00-0.50	D		0.30	84.10		Firm brown slightly sandy slightly gravelly CLAY with occasional rootlets. Gravel is subangular to subrounded fine to coarse concrete and limestone. (MADE GROUND)
					0.60	83.80		Light grey slightly sandy GRAVEL of subangular fine to coarse concrete and limestone. (MADE GROUND)
		1.00	D					Stiff grey and orange-brown CLAY with occasional silt grade gypsum crystals and rootlets. (WHITBY MUDSTONE FORMATION)
		1.00-1.50	D					
		1.50-1.95	UT	35 Blows (95% rec)				
		2.00	D					
		2.50-2.95	D		2.50	81.90		Stiff thinly laminated grey locally orange-brown CLAY with occasional sand sized gypsum crystals and angular fine to coarse sized ironstone gravel. (WHITBY MUDSTONE FORMATION)
		2.50	SPT	N=14 (2,2/3,3,3,5)				*.. below 2.50m, rootlets becoming absent, becoming thinly laminated.*
		3.00	D					*.. below 3.00m, becoming slightly gravelly with angular fine to coarse ironstone.*
		3.00	D					
		3.50-3.95	UT	0 Blows				
		3.50-3.95	UT	45 Blows (95% rec)				
		4.00	D					
		4.00	D					
		4.50-4.95	D		4.50	79.90		Very stiff in places thinly laminated grey occasionally light grey CLAY. (WHITBY MUDSTONE FORMATION)
		4.50	SPT	N=27 (3,3/5,7,7,8)				*.. below 4.50m, gypsum and gravel becoming absent.*
		5.50-5.95	UT	0 Blows				
		5.50-5.95	UT	50 Blows (90% rec)				
		6.00	D					*.. below 6.00m, becoming thinly laminated.*
		6.00	D					
		6.00-6.50	D					
		6.50	D					
		7.00-7.45	D					
		7.00	SPT	N≥50 (4,7/10,15,12,15)				
		8.00	D					*.. below 8.00m, laminations becoming absent.*
		8.00	D					
		8.50-8.95	D		8.50	75.90		Hard thinly laminated bluish grey CLAY with occasional silt and sand grade gypsum crystals and rare shell fragments. (WHITBY MUDSTONE FORMATION)
		8.50	SPT	N=48 (9,7/12,10,12,14)				
		9.50	D					
		9.50	D					
		9.60	SPT	N≥50 (25 for 75mm/50 for 75mm)	9.75	74.65		End of Borehole at 9.75m

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Chiselled from 9.30m to 9.50m for 1.00 hour. 3. Borehole cased to 1.50m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: MOB **Checked:** RB

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Cable Percussion

Borehole No. BHG004

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	473274E, 254579N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	82.51m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	12/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00-0.50	B					Firm dark brown CLAY with occasional gravel of mixed lithology and rootlets. (TOPSOIL)
		0.50-1.00	B		0.50	82.01		Firm extremely closely fissured orange-brown mottled bluish grey CLAY with occasional subangular fine to medium sized fragments of mudstone. (WHITBY MUDSTONE FORMATION)
		1.00-1.50	B					
		1.50-1.95	U	35 Blows (90% rec)				
		2.00	D		2.00	80.51		Stiff extremely closely fissured orange-grey, bluish grey and greenish grey CLAY with occasional angular and subangular fine to medium sized mudstone fragments. (WHITBY MUDSTONE FORMATION)
		2.50	SPT	N=17 (2,4/2,4,4,7)				
								.. Becoming very stiff below approximately 3.00m.
		3.50-3.95	U	45 Blows (95% rec)				
		4.00	D					
		4.50	SPT	N=31 (3,4/5,6,8,12)				
		5.50-5.95	U	55 Blows (95% rec)				
		6.00	D		6.00	76.51		Hard extremely closely fissured dark grey CLAY with light grey silt along fissure planes in places. (WHITBY MUDSTONE FORMATION)
		6.50	D					
		7.00	SPT	N≥50 (5,10/10,10,15,18)				
		7.50-8.50	B					
		8.50-8.90	B					*.. Below 8.50m, with frequent fossil remains.*
		8.50	SPT	N≥50 (9,9/50 for 225mm)				
		8.90	SPT	N≥50 (25 for 25mm/50 for 25mm)	8.95	73.56		End of Borehole at 8.95m

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. No groundwater encountered. 3. Chiselled from 8.50m to 8.90m for 1.00 hour. 4. Borehole cased to 1.50m at 150mm diameter. 5. Borehole backfilled with arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHG005

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	473879E, 254720N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	83.12m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	25/08/16 - 26/08/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.20-1.20	B		0.20	82.92		Topsoil (driller's description) (TOPSOIL)
								Firm brown sandy CLAY. (WHITBY MUDSTONE FORMATION)
		1.20-1.65	U	14 Blows (100% rec)	1.20	81.92		
		1.65-1.80	D					Firm light grey mottled orange-brown sandy CLAY with occasional subangular medium to coarse sized flint gravel. (WHITBY MUDSTONE FORMATION)
		1.80-2.00	B					
		2.00	SPT	N=28 (5,6/7,6,7,8)	2.10	81.02		
		2.50-2.80	B					Stiff closely fissured bluish grey mottled orange-brown CLAY with frequent angular fine to medium sized fragments of mudstone. (WHITBY MUDSTONE FORMATION)
		2.80-3.00	B					
		3.00	SPT	N=32 (5,6/8,7,8,9)				
		4.00	SPT	N=34 (8,9/8,9,9,8)	4.00	79.12		Dense bluish grey very clayey SAND. (WHITBY MUDSTONE FORMATION)
	▼	5.00	SPT	N=38 (8,9/9,9,10,10)	5.00	78.12		Very stiff extremely closely fissured bluish grey and greenish grey CLAY with some angular medium gravel sized siltstone fragments. (WHITBY MUDSTONE FORMATION)
		5.50-6.00	B					
	▽	6.00-6.20	D		6.00	77.12		
		6.00	SPT	N≥50 (25 for 75mm/79 for 115mm)	6.20	76.92		Moderately weak grey LIMESTONE. (MARLSTONE FORMATION)
								End of Borehole at 6.20m

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Chiselled from 6.00m to 6.20m for 0.50 hour. 3. Groundwater struck at 6.10m rising to 5.10m after 20 minutes with 5.90m of casing. 4. Borehole cased to 5.90m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHG006

Sheet 1 of 2

Project Name:	Rail Central		**Co-ords:**	474197E, 254409N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	89.60m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	26/08/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.00-0.40	B					Light brown silty SAND with abundant roots and rootlets. (TOPSOIL)
		0.40-1.20	B		0.40	89.20		Firm light orange-brown mottled light grey CLAY with frequent subangular and angular fine to medium sized mudstone fragments and occasional roots. (WHITBY MUDSTONE FORMATION)
		1.20	SPT	N=45 (8,10/12,13,10,10)	1.20	88.40		Very stiff very thinly bedded dark grey and orange-brown CLAY with frequent angular fine to coarse sized mudstone fragments and fossils. (WHITBY MUDSTONE FORMATION)
		2.00	SPT	N=43 (9,8/9,10,12,12)				
		2.50-3.00	B					
		3.00	SPT	N≥50 (10,11/10,12,13,15)	3.00	86.60		Very stiff bluish grey CLAY with frequent angular fine to medium sized mudstone fragments and fossil remains. (WHITBY MUDSTONE FORMATION)
		4.00	SPT	N=42 (8,9/10,11,10,11)				
		5.00	SPT	N=38 (8,8/8,9,10,11)				
		5.50-6.00	B		5.50	84.10		Hard thickly laminated grey CLAY with rare gypsum crystals and light grey silt along bedding laminations. (WHITBY MUDSTONE FORMATION)
		6.00	SPT	N=47 (7,8/10,11,13,13)				
		7.00	SPT	N≥50 (10,12/13,13,14,14)				
		8.00	SPT	N≥50 (10,13/15,16,16,17)				
		8.50-9.00	B		8.50	81.10		Hard bluish grey CLAY with frequent angular fine to medium sized mudstone fragments and rare gypsum crystals. (WHITBY MUDSTONE FORMATION)
		9.00	SPT	N≥50 (9,10/14,14,14,15)				
		10.00	SPT	N≥50 (11,13/14,14,15,15)				

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. No groundwater encountered. 3. Borehole cased to 5.00m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHG006 Sheet 2 of 2

Project Name:	Rail Central		**Co-ords:**	474197E, 254409N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	89.60m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	26/08/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
					10.45	79.15		Hard bluish grey CLAY with frequent angular fine to medium sized mudstone fragments and rare gypsum crystals. (WHITBY MUDSTONE FORMATION) End of Borehole at 10.45m

11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0 19.0 20.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. No groundwater encountered. 3. Borehole cased to 5.00m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHG007

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	473465E, 254596N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	83.64m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	13/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.20-0.60	B		0.20	83.44		Firm brown clay (driller's description). (TOPSOIL)
								Firm light grey mottled yellow-brown slightly sandy CLAY with mudstone lithorelicts up to 30mm. (WHITBY MUDSTONE FORMATION)
		1.00	D					
		1.20-1.65	B					
		1.20	SPT	N=11 (2,2/2,3,3,3)				
		2.00	D		2.00	81.64		
		2.00-2.45	U	37 Blows (100% rec)				Stiff thickly laminated extremely closely fissured dark grey mottled yellow-brown CLAY with frequent angular fine to coarse sized mudstone fragments and occasional fossils. (WHITBY MUDSTONE FORMATION)
		2.50-3.00	B					
		3.00	D					
		3.00-3.45	B					
		3.00	SPT	N=16 (3,4/4,3,4,5)				
		4.00	D					
		4.00-4.45	U	55 Blows (100% rec)				
		5.00	D		5.00	78.64		
		5.00-5.45	B					Very stiff extremely closely fissured bluish grey CLAY. (WHITBY MUDSTONE FORMATION)
		5.00	SPT	N=43 (8,8/10,10,11,12)				
		6.00	D					
		6.50	SPT	N≥50 (25 for 60mm/50 for 52mm)	6.50	77.14		Weak grey MUDSTONE. (WHITBY MUDSTONE FORMATION)
					7.00	76.64		End of Borehole at 7.00m

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Borehole cased to 1.00m at 150mm diameter. 3. No groundwater encountered. 4. Chiselled from 6.80m to 7.00m for 0.50 hour.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHG008

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	473230E, 254831N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	80.03m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	02/09/16 - 05/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20-0.60	B		0.20	79.83		Firm brown sandy clay (driller's description). (TOPSOIL)
								Firm orange-brown slightly gravelly CLAY. Gravel is subrounded medium sized of flint. (WHITBY MUDSTONE FORMATION)
		1.00	D					
		1.20-1.65	B		1.20	78.83		
		1.20	SPT	N=12 (2,2/2,3,3,4)				Firm orange-brown mottled dark grey slightly sandy CLAY with occasional subangular and subrounded fine to coarse sized mudstone fragments. (WHITBY MUDSTONE FORMATION)
		2.00	D		2.00	78.03		
		2.00-2.45	U	35 Blows (100% rec)				Firm bluish grey, orange-brown and greenish grey CLAY with occasional mudstone fragments, gypsum crystals and fossil remains. (WHITBY MUDSTONE FORMATION)
		2.50-3.00	B					
		3.00	D					
		3.00-3.45	B					
		3.00	SPT	N=15 (2,2/3,4,4,4)				
		4.00	D					
		4.00-4.45	U	60 Blows (100% rec)				
		4.50-5.00	B					
		5.00	D		5.00	75.03		
		5.00	SPT	N=35 (7,8/8,8,9,10)				Very stiff extremely closely fissured dark grey CLAY with frequent fossil remains. (WHITBY MUDSTONE FORMATION)
		5.50-6.00	B					
		6.50-6.95	B					
		6.50	SPT	N≥50 (7,8/9,11,16,18)				*.. Becoming hard below approximately 6.50m.*
		7.00	D					
		8.00	SPT	N≥50 (8,12/50 for 222mm)	8.00	72.03		Weak dark grey MUDSTONE. (WHITBY MUDSTONE FORMATION)
					8.37	71.66		End of Borehole at 8.37m

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. No groundwater encountered. 3. Borehole cased to 5.00m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHG009

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	473725E, 254841N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	84.20m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	22/09/16 - 23/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.20-0.60	B					Dark brown slightly sandy slightly gravelly SILT with occasional rootlets. Gravel is subangular to subrounded fine to medium sized ironstone. (TOPSOIL)
					0.60	83.60		Medium dense orange-brown slightly clayey fine to medium grained SAND. (GLACIOFLUVIAL DEPOSITS)
		1.00	D					
		1.20-1.65	B					
		1.20-1.65	D					
		1.20	SPT	N=11 (2,2/3,3,2,3)				
		2.00	D					
		2.00-2.45	B					
		2.00	SPT	N=15 (2,3/3,4,4,4)				
		3.00	D					
		3.00-3.45	B					
		3.00	SPT	N=20 (3,4/5,4,5,6)				
		4.00-4.45	B					
		4.00-4.45	D					*.. below 4.00m, becoming locally very clayey.*
		4.00	SPT	N=20 (3,4/4,5,5,6)				
		5.00-5.45	B					
		5.00-5.45	D					
		5.00	SPT	N=22 (4,4/5,6,5,6)				
		6.00	D					
		6.00	D					*.. Below 6.00m, with occasional pockets of sandy clay.*
		6.50-6.95	B					
		6.50-6.95	D					
		6.50	SPT	N=23 (3,4/5,6,6,6)				
		7.00	D					
		8.00	D					
		8.00-8.45	B					
		8.00	SPT	N=24 (4,4/5,6,7,6)				
		9.00	D		9.00	75.20		Medium dense orange-brown slightly clayey gravelly fine to coarse grained SAND. Gravel is subangular and angular fine to coarse sized ironstone. (GLACIOFLUVIAL DEPOSITS)
		9.50-9.95	B					
		9.50-9.95	D					
		9.50	SPT	N=24 (3,4/5,6,6,7)				
					10.00	74.20		End of Borehole at 10.00m

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Borehole cased to 9.50m at 150mm diameter. 3. No groundwater encountered.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: MOB **Checked:** RB

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Cable Percussion

Borehole No. BHG010

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472352E, 254722N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	85.11m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	14/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.20-0.60	B		0.20	84.91		Firm brown clay (driller's description). (TOPSOIL)
								Firm very closely fissured grey mottled reddish brown CLAY. (WHITBY MUDSTONE FORMATION)
		1.00	D					
		1.20-1.65	B					
		1.20	SPT	N=14 (2,2/3,3,4,4)				
		2.00	D		2.00	83.11		
		2.00-2.45	U	42 Blows (100% rec)				Stiff thickly laminated very closely fissured grey CLAY with frequent subangular and angular, fine to coarse sized mudstone fragments and brown staining along bedding laminations in places. (WHITBY MUDSTONE FORMATION)
		2.50-3.00	B					
		3.00	D					
		3.00-3.45	B					
		3.00	SPT	N=24 (2,3/5,5,7,7)				*.. Below 3.00m, becoming very stiff with frequent gypsum crystals.*
		4.00	D					
		4.00-4.45	B					
		4.00	SPT	N=38 (5,5/7,8,10,13)				
		5.00	D					
		5.00-5.45	B					
		5.00	SPT	N=43 (6,7/9,10,12,12)				
		6.00	D					
		6.50	SPT	N≥50 (8,9/50 for 260mm)				
					6.83	78.28		*.. Becoming hard and impenetrable at base.*
								End of Borehole at 6.83m

7.0 8.0 9.0 10.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Chiselled from 6.50m to 6.80m for 0.50 hour. 3. Borehole cased to 1.00m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHG011

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472270E, 254988N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	83.07m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	22/08/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.30-0.70	B		0.30	82.77		Brown stiff silty clay topsoil (driller's description). (TOPSOIL)
		0.70-1.20	B					Firm orange-brown mottled light grey CLAY with frequent rootlets. (WHITBY MUDSTONE FORMATION)
		1.20	B					
		1.20	SPT	N≥50 (1,3/50 for 242mm)	1.50	81.57		
					1.70	81.37		Very dense light brown clayey SAND. (WHITBY MUDSTONE FORMATION)
		2.00	D					Stiff grey mottled orange-brown CLAY with occasional mudstone fragments. (WHITBY MUDSTONE FORMATION)
		2.20-2.65	UT	26 Blows (100% rec)				
	▼	2.65-2.80	D					
		3.25	SPT	N=28 (2,5/5,7,7,9)				
					3.60	79.47		Stiff thickly laminated dark grey mottled orange-brown CLAY. (WHITBY MUDSTONE FORMATION)
		4.00	D					
		4.30-4.65	UT	39 Blows				
		4.30-4.80	B					
		4.65-4.80	D		4.60	78.47		Very weak dark grey and brown SILTSTONE with very closely spaced mudstone laminations. (MARLSTONE FORMATION)
		4.80-4.90	D					
		5.00	D					
		5.30	D		5.20	77.87		Very stiff dark grey sandy CLAY. (MARLSTONE FORMATION)
	▼				5.40	77.67		
		5.55	SPT	N=45 (6,6/8,10,11,16)	5.60	77.47		Very weak grey SILTSTONE. (MARLSTONE FORMATION)
					5.80	77.27		Very stiff dark grey sandy CLAY with occasional angulae fragments of limestone. (DYRHAM FORMATION)
		6.50	D					Very stiff thickly laminated grey sandy CLAY with some sand sized gypsum crystals and gravel sized fossils. (DYRHAM FORMATION)
		7.05	SPT	N≥50 (6,7/50 for 249mm)				
		8.00	D		8.00	75.07		Very dense dark grey clayey SAND. (DYRHAM FORMATION)
		8.55	SPT	N≥50 (7,9/50 for 255mm)				
		9.30	D		9.30	73.77		
		9.40	SPT	N≥50 (25 for 35mm/50 for 41mm)	9.48	73.59		Moderately weak dark grey MUDSTONE. (DYRHAM FORMATION)
								End of Borehole at 9.48m

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Groundwater struck at 2.70m remaining at this level after 20 minutes with 1.50m of casing. 3. Chiselled from 2.70m to 2.90m for 0.50 hour. 4. Groundwater struck at 5.50m remaining at this level after 20 minutes with 5.00m of casing. 5. Chiselled between 9.30m and 9.40m for 0.50 hour. 6. Borehole cased to 6.00m at 150mm diameter. 7. borehole backfilled with arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHG012

Sheet 1 of 2

Project Name:	Rail Central		**Co-ords:**	472473E, 255165N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	78.78m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	06/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.00-0.50	B					Brown slightly sandy SILT with frequent rootlets. (TOPSOIL)
		0.50-1.00	B		0.50	78.28		Light brown clayey SAND. (MARLSTONE FORMATION)
		1.00-1.50	B		1.00	77.78		Firm orange-brown, light grey and brown mottled very sandy CLAY. (MARLSTONE FORMATION)
		1.50-1.95	UT	30 Blows (95% rec)				
		2.00	D		2.00	76.78		Weak multicoloured MUDSTONE. (MARLSTONE FORMATION)
		2.00-2.50	B					
		2.50-2.95	B		2.50	76.28		Stiff brown mottled orange-brown slightly sandy CLAY with occasional mudstone fragments. (DYRHAM FORMATION)
		2.50	SPT	N=45 (5,5/15,15,10,5)				
		3.00-3.50	B					
		3.50-3.95	UT	45 Blows (95% rec)				
		4.00	D		4.00	74.78		Stiff dark grey very sandy CLAY with abundant fine gravel sized gypsum crystals. (DYRHAM FORMATION)
		4.50	SPT	N=22 (3,3/3,5,6,8)				
		5.00	D					
		6.00	D					
		6.50	D					
		7.00	SPT	N=44 (4,5/9,9,11,15)	7.00	71.78		Very stiff very thinly bedded dark grey CLAY with abundant sand sized gypsum crystals and light grey silt along bedding planes in places. (DYRHAM FORMATION)
		8.00	D					
		8.50	SPT	N≥50 (6,8/10,12,16,20)				
		9.50	D					
		10.00	SPT	N=45 (5,5/6,9,12,18)				

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Groundwater struck at 2.50m rising to 2.25m after 20 minutes with 1.50m of casing. Sealed off at 3.50m. 3. Chiselled from 2.50m to 2.60m for 0.50 hour. 4. Borehole cased to 3.50m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHG012

Sheet 2 of 2

Project Name:	Rail Central		**Co-ords:**	472473E, 255165N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	78.78m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	06/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
					10.45	68.33		Very stiff very thinly bedded dark grey CLAY with abundant sand sized gypsum crystals and light grey silt along bedding planes in places. (DYRHAM FORMATION) End of Borehole at 10.45m

11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
19.0
20.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Groundwater struck at 2.50m rising to 2.25m after 20 minutes with 1.50m of casing. Sealed off at 3.50m. 3. Chiselled from 2.50m to 2.60m for 0.50 hour. 4. Borehole cased to 3.50m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHG014

Sheet 1 of 2

Project Name:	Rail Central		**Co-ords:**	474164E, 254251N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	90.42m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	30/08/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.40-1.20	B		0.40	90.02		Topsoil (driller's description) (TOPSOIL)
		1.20-1.65	U	34 Blows (100% rec)	1.20	89.22		Firm light brown CLAY with rare subrounded fine to coarse flint gravel and frequent rootlets. (WHITBY MUDSTONE FORMATION)
		1.65-1.80	D					
		2.00	SPT	N=25 (4,5/6,5,7,7)	2.00	88.42		Firm thickly laminated grey mottled orange-brown CLAY with occasional fossil remains. (WHITBY MUDSTONE FORMATION)
		2.50-3.00	B					
		3.00	SPT	N=49 (10,11/12,12,13,12)				Stiff very thinly bedded bluish grey CLAY with occasional mudstone fragments, sand sized gypsum crystals and fine to medium gravel sized fossil remains. (WHITBY MUDSTONE FORMATION)
		4.00	SPT	N=30 (7,8/8,7,7,8)				*.. Becoming very stiff below approximately 3.00m.*
		5.00	SPT	N=37 (6,8/9,10,9,9)				
		5.50-6.00	B					
		6.00	SPT	N=48 (11,10/11,12,12,13)				
		7.00	SPT	N≥50 (11,12/14,15,15,16)				*.. Becoming hard below approximately 7.00m.*
		8.00	SPT	N=49 (10,12/12,12,13,12)				
		8.50-9.00	B					
		9.00	SPT	N≥50 (11,12/14,15,16,17)				
		10.00	SPT	N≥50 (12,12/14,13,15,17)				

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. No groundwater encountered. 3. Borehole cased to 3.00m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHG014

Sheet 2 of 2

Project Name:	Rail Central		**Co-ords:**	474164E, 254251N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	90.42m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	30/08/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
					10.45	79.97		Stiff very thinly bedded bluish grey CLAY with occasional mudstone fragments, sand sized gypsum crystals and fine to medium gravel sized fossil remains. (WHITBY MUDSTONE FORMATION) End of Borehole at 10.45m

11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
19.0
20.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. No groundwater encountered. 3. Borehole cased to 3.00m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHG015

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472903E, 255508N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	73.57m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	07/10/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.50	D		0.50	73.07		Firm brown CLAY. (TOPSOIL)
		0.50-1.00	D					Firm light grey mottled reddish brown CLAY with occasional mudstone lithorelicts up to 20mm. (WHITBY MUDSTONE FORMATION)
		1.00-1.50	D					
		1.50-1.95	UT	25 Blows (95% rec)				
		2.00	D		2.00	71.57		Stiff thickly laminated bluish grey CLAY with frequent gypsum crystals. (WHITBY MUDSTONE FORMATION)
		2.50	SPT	N=14 (2,2/3,3,3,5)	2.50	71.07		Stiff very thinly bedded greenish brown mottled bluish grey CLAY with many mudstone fragments. (WHITBY MUDSTONE FORMATION)
		3.50-3.95	UT	25 Blows (90% rec)				
		4.00	D					
		4.50	SPT	N=24 (2,2/3,6,6,9)				
		5.00	D		5.00	68.57		Very stiff thickly laminated extremely closely fissured grey CLAY with light grey silt along bedding laminations in places, and rare fossil remains. (WHITBY MUDSTONE FORMATION)
		5.50	SPT	N=34 (3,4/7,8,9,10)				
		6.50	D					
		7.00	SPT	N=42 (3,6/9,9,11,13)				
		8.00	D					
		8.50	D					
		8.50	SPT	N≥50 (5,8/50 for 225mm)				
		9.00	SPT	N≥50 (20 for 25mm/50 for 25mm)	9.00 9.05	64.57 64.52		Weak dark grey MUDSTONE. (WHITBY MUDSTONE FORMATION) End of Borehole at 9.05m

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. No groundwater encountered. 3. Chiselled from 8.80m to 9.00m for 1.00 hour. 4. Borehole cased to 1.50m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHG016

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	473562E, 254964N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	80.85m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	04/10/16 - 05/10/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.00-0.50	D					Greyish brown slightly sandy SILT with rare rootlets. (TOPSOIL)
		0.50-1.00	D		0.50	80.35		Brown very clayey fine to medium grained SAND. (GLACIOFLUVIAL DEPOSITS)
		1.00-1.50	D					*.. below 0.50m, rare rootlets.*
		1.50-1.95	UT	35 Blows (90% rec)				
		2.00	D		2.00	78.85		Medium dense orange-brown clayey fine to medium grained SAND. (GLACIOFLUVIAL DEPOSITS)
		2.50-2.95	D					
		2.50	SPT	N=14 (2,3/3,3,3,5)				
	▼	3.00	D					
		3.00	D					
		3.50-3.95	B					
		3.50-3.95	B					
	▽	3.50	SPT	N=23 (3,3/5,5,6,7)				
		4.50-4.95	B					
		4.50-4.95	B					
	▼	4.50	SPT	N=19 (2,2/3,4,5,7)				
		5.50-5.70	B		5.50	75.35		Stiff grey and orange-brown CLAY. (WHITBY MUDSTONE FORMATION)
		5.50-5.70	B					
		5.70-6.15	UT	0 Blows				
		5.70-6.15	UT	45 Blows (90% rec)				
		6.20	D		6.20	74.65		Stiff grey locally light grey CLAY. (WHITBY MUDSTONE FORMATION)
		6.20	D					
		6.50	D					
		6.50	D					
		7.00-7.45	D		7.00	73.85		Stiff thinly laminated grey and orange-brown sandy CLAY with occasional angular and subangular fine to coarse sized ironstone gravel. (MARLSTONE FORMATION)
		7.00	SPT	N=29 (5,6/5,5,7,12)				
		7.50-8.50	B					*.. below 7.00m, becoming thinly laminated.*
	▽	7.50-8.50	B					
		8.50-8.95	D		8.50	72.35		(Compact) grey SILT with abundant sand sized gypsum crystals and occasional angular and subangular fine to coarse sized ironstone gravel. (DYRHAM FORMATION)
		8.50	SPT	N=48 (6,6/8,10,15,15)				
		9.00-9.50	B		9.00	71.85		Hard grey CLAY with many mudstone fragments. (DYRHAM FORMATION)
		9.00-9.50	B					*.. below 9.00m, becoming slightly gravelly with angular fine to coarse ironstone.*
		9.50-9.60	D					
		9.50	SPT	N≥50 (25 for 75mm/50 for 150mm)	9.72	71.13		End of Borehole at 9.72m

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Groundwater struck at 4.00m rising to 3.00m after 20 minutes with 3.00m of casing. Sealed off at 5.50m. 3. Groundwater struck at 8.00m rising to 5.00m after 20 minutes with 6.00m of casing. 4. Chiselled from 9.30m to 9.50m for 1.00 hour. 5. Borehole cased to 6.00m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: MOB **Checked:** RB

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Cable Percussion

Borehole No. BHG017

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	473680E, 255109N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	77.95m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	27/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.20-0.60	B		0.20	77.75		Firm brown clay (driller's description). (TOPSOIL)
								Soft brown and reddish brown slightly sandy CLAY with a slight organic odour. (ALLUVIUM)
		1.00	D		1.00	76.95		Soft brown and reddish brown sandy CLAY. (ALLUVIUM)
		1.20-1.60	B					*.. at 1.00m, slight organic odour.*
		1.20-1.65	B					*.. at 1.20m, organic odour becoming absent and becoming sandy.*
		1.20	SPT	N=7 (1,1/1,2,2,2)				
		2.00	D		1.90	76.05		Medium dense orange-brown clayey slightly gravelly fine to coarse grained SAND. Gravel is angular to subrounded fine to medium sized ironstone. (GLACIOFLUVIAL DEPOSITS)
		2.00-2.45	B					
		2.00-2.45	B					
		2.00-2.45	D					
		2.00	SPT	N=17 (3,3/4,4,4,5)				
		3.00	D					
		3.00	D					
		3.00-3.45	B					
		3.00-3.45	B					
		3.00-3.45	D		3.50	74.45		Very stiff light grey calcareous CLAY with some mudstone fragments. (WHITBY MUDSTONE FORMATION)
		3.00	SPT	N=17 (2,3/3,4,5,5)				
		4.00	D		4.00	73.95		Extremely weak thinly laminated grey MUDSTONE with occasional shell fragments. (WHITBY MUDSTONE FORMATION)
		4.00	D					
		4.00-4.45	D					
		4.00	SPT	N≥50 (7,5/50 for 245mm)	4.45	73.50		End of Borehole at 4.45m

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Borehole cased to 4.00m at 150mm diameter. 3. No groundwater encountered.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: MOB **Checked:** RB

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Cable Percussion

Borehole No. BHG018

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	473771E, 255030N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	82.75m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	21/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.20-0.60	B		0.20	82.55		Firm brown stony clay (driller's description). (TOPSOIL)
					0.60	82.15		Firm orange-brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse sized chert. (GLACIOFLUVIAL DEPOSITS)
		1.00	D					Stiff grey and orange-brown slightly gravelly CLAY. Gravel is subangular to rounded fine to medium sized mudstone and limestone. (GLACIOFLUVIAL DEPOSITS)
		1.20-1.65	B					
		1.20	SPT	N=15 (2,2/3,3,4,5)				
		2.00	D		2.00	80.75		Medium dense orange brown in parts clayey fine to medium grained SAND. (GLACIOFLUVIAL DEPOSITS)
		2.00-2.45	B					
		2.00	SPT	N=15 (3,2/3,4,4,4)				
		3.00	D					*.. becoming loose below 3.00m.*
		3.00-3.45	B					
		3.00	SPT	N=8 (2,2/2,2,2,2)				
		4.00	D					
		4.00-4.45	B					
		4.00	SPT	N=9 (2,3/2,2,3,2)				
		5.00	D					*.. Becoming medium dense below 5.00m.*
		5.00-5.45	B					
		5.00	SPT	N=11 (3,2/3,3,2,3)				
		6.00	D		6.00	76.75		Orange-brown gravelly fine to coarse grained SAND. Gravel is subangular to subrounded fine to coarse sized ironstone. (GLACIOFLUVIAL DEPOSITS)
		6.50-6.95	B		6.40	76.35		
		6.50	SPT	N=19 (3,3/4,4,5,6)				Medium dense dark grey sandy GRAVEL with occasional cobbles. Gravel is subangular to subrounded fine to coarse sized ironstone. Cobbles are ironstone. (GLACIOFLUVIAL DEPOSITS)
		7.00	D					
		8.00	D					*.. Becoming very sandy below 8.00m.*
		8.00-8.45	B					
		8.00	SPT	N=33 (22,8/9,7,8,9)	8.50	74.25		Very stiff dark bluish grey and orange-brown slightly sandy CLAY. (WHITBY MUDSTONE FORMATION)
		9.00	D					
		9.50	SPT	N=29 (5,5/6,7,7,9)				
					10.00	72.75		End of Borehole at 10.00m

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. No groundwater encountered. 3. Borehole cased to 8.70m at 150mm diameter. 4. Borehole backfilled with arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: MOB **Checked:** RB

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Cable Percussion

Borehole No. BHG019

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	473724E, 255178N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	77.90m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	22/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.20-0.60	B		0.30	77.60		Firm brown clay (driller's description). (TOPSOIL)
		1.00	D					Firm reddish brown sandy slightly gravelly CLAY with occasional rootlets. Gravel is subangular and subrounded fine to coarse sized ironstone. (GLACIOFLUVIAL DEPOSITS)
		1.20-1.65	B					
		1.20	SPT	N=14 (2,2/3,4,3,4)				
		2.00	D		1.90	76.00		Stiff grey and orange-brown CLAY. (WHITBY MUDSTONE FORMATION)
		2.00-2.45	U	42 Blows (100% rec)				
		2.50-3.00	B		2.50	75.40		Stiff thinly laminated grey calcareous CLAY with silt sized gypsum crystals and fine gravel sized fossil fragments. (WHITBY MUDSTONE FORMATION)
		3.00	D		3.00	74.90		
		3.00-3.45	B					Stiff thickly laminated grey CLAY with occasional subangular fine to coarse sized limestone fragments. (WHITBY MUDSTONE FORMATION)
		3.00	SPT	N=24 (2,3/4,4,8,8)				
		4.00	SPT	N≥50 (25 for 75mm/50 for 220mm)	4.00	73.90		Weak grey MUDSTONE. (WHITBY MUDSTONE FORMATION)
					4.30	73.60		End of Borehole at 4.30m

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. No groundwater encountered. 3. Chiselled from 3.70m to 4.00m for 1 hour. 4. Borehole cased to 2.00m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: MOB **Checked:** RB

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Cable Percussion

Borehole No. BHG021

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	473228E, 254957N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	85.22m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	05/09/16 - 06/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20-0.60	B		0.20	85.02		Firm brown clay (driller's description). (TOPSOIL)
								Reddish brown very sandy SILT. (GLACIOFLUVIAL DEPOSITS)
					0.80	84.42		
		1.00	D					Stiff yellow-brown slightly sandy CLAY. (WHITBY MUDSTONE FORMATION)
		1.20-1.65	B		1.20	84.02		
		1.20	SPT	N=14 (2,2/2,6,3,3)				Stiff closely fissured grey mottled reddish brown CLAY with frequent mudstone lithorelicts up to 20mm. (WHITBY MUDSTONE FORMATION)
		2.00	D		2.00	83.22		
		2.00-2.45	U	32 Blows (100% rec)				Stiff thickly laminated extremely closely fissured bluish grey CLAY with occasional mudstone lithorelicts up to 30mm and crystals of gypsum. (WHITBY MUDSTONE FORMATION)
		2.50-3.00	B					
		3.00	D					
		3.00-3.45	B					
		3.00	SPT	N=18 (1,3/4,4,5,5)				
		4.00	D		4.00	81.22		
		4.00-4.45	U	62 Blows (100% rec)				Very stiff extremely closely to closely fissured bluish grey CLAY. (WHITBY MUDSTONE FORMATION)
		4.50-5.00	B					
		5.00	D					
		5.00-5.45	B					
		5.00	SPT	N=40 (8,8/9,9,10,12)				
		6.00	D					
		6.50-6.95	B					
		6.50	SPT	N=44 (7,8/11,9,12,12)				
		7.00	D					
		8.00	D					
		8.00-8.45	B					*.. Becoming hard below approximately 8.00m.*
		8.00	SPT	N≥50 (6,8/60 for 290mm)				
		9.50-9.95	B					
		9.50	SPT	N≥50 (8,12/50 for 189mm)	9.77	75.45		End of Borehole at 9.77m

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. No groundwater encountered. 3. Chiselled from 10.20m to 10.40m for 0.50 hour. 4. Borehole cased to 1.00m at 150mm diameter. 5. Borehole backfilled with arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHG022

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	473285E, 255191N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	86.55m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	26/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.20-0.60	B		0.20	86.35		Firm brown clay (driller's description). (TOPSOIL)
								Medium dense orange-brown slightly gravelly fine to medium grained SAND. Gravel is subangular fine to medium sized ironstone. (GLACIOFLUVIAL DEPOSITS)
		1.00	D					
		1.20-1.65	B					
		1.20-1.65	D					
		1.20	SPT	N=13 (2,3/3,3,4,3)				
		2.00	D					
		2.00-2.45	B					
		2.00	SPT	N=15 (3,3/3,4,4,4)				
		3.00	D					
		3.00-3.45	B					
		3.00	SPT	N=20 (3,4/5,4,5,6)				*.. Below 3.00m, locally slightly clayey.*
		4.00	D		4.00	82.55		
		4.00-4.45	B					Medium dense orange-brown medium grained SAND. (GLACIOFLUVIAL DEPOSITS)
		4.00	SPT	N=21 (4,5/4,5,6,6)				
		5.00	D					
		5.00-5.45	B					
		5.00	SPT	N=23 (4,4/5,6,6,6)				
		6.00	D					
		6.00-6.45	B					
		6.50-6.95	B					
		6.50	SPT	N=25 (5,5/6,6,7,6)				
		7.00	D					*.. below 7.00m, becoming slightly clayey.*
		8.00	D					*.. below 8.00m, clay becoming absent.*
		8.00-8.45	B					
		8.00	SPT	N=21 (4,5/4,5,6,6)				
		9.00	D					
		9.50-9.95	B					
		9.50-9.95	D					
		9.50	SPT	N=23 (3,5/5,5,6,7)				
		10.00	D		10.00	76.55		End of Borehole at 10.00m

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Borehole cased to 9.50m at 150mm diameter. 3. No groundwater encountered. 4. Borehole backfilled with arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: MOB **Checked:** RB

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Cable Percussion

Borehole No. BHG023

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472964E, 255094N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	79.59m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	15/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.20-0.60	B		0.40	79.19		Firm dark brown slightly sandy CLAY. (TOPSOIL)
		1.00	D					Firm grey mottled brown CLAY. (WHITBY MUDSTONE FORMATION)
		1.20-1.65 1.20	B SPT	N=19 (1,2/2,5,5,7)				
		2.00 2.00-2.45	D U	44 Blows (100% rec)	2.00	77.59		Stiff yellow-brown CLAY with some mudstone fragments. (WHITBY MUDSTONE FORMATION)
		3.00 3.00-3.45 3.00	D B SPT	N≥50 (5,14/50 for 225mm)	3.00	76.59		Extremely weak yellow-brown MUDSTONE. (WHITBY MUDSTONE FORMATION)
		4.00 4.00	D SPT	N≥50 (25 for 85mm/50 for 70mm)	4.15	75.44		*.. Becoming moderately weak below 4.00m.* End of Borehole at 4.15m

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. No groundwater encountered. 3. Chiselled from 4.00m to 4.20m for 0.50 hour. 4. Borehole cased to 1.00m at 150mm diameter. 5. Borehole backfilled with arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHG024

Sheet 1 of 2

Project Name:	Rail Central		**Co-ords:**	473194E, 255020N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	88.16m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	05/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.00-1.00	B		0.20	87.96		Topsoil (driller's description) (TOPSOIL)
								Orange-brown slightly silty SAND. (GLACIOFLUVIAL DEPOSITS)
		1.00-1.20	D		1.00	87.16		
		1.20	SPT	N=7 (1,1/1,2,2,2)				Firm light grey, orange-brown and light brown sandy slightly gravelly CLAY with occasional sand pockets. Gravel is subrounded and rounded medium sized mudstone. (GLACIOFLUVIAL DEPOSITS)
		2.00	SPT	N=10 (1,1/2,2,3,3)				
		2.75	D		2.75	85.41		
		3.00-3.45	UT	25 Blows (100% rec)				Stiff extremely closely fissured dark grey CLAY with frequent angular fine to coarse sized mudstone fragments. (WHITBY MUDSTONE FORMATION)
		3.50	D					
		4.00	SPT	N=25 (2,3/4,5,6,10)				
		4.75	D					
		5.00-5.45	UT	50 Blows (95% rec)				
		5.50	D					
		6.00	D					
		6.50	SPT	N=36 (5,4/5,8,10,13)	6.50	81.66		Very stiff extremely closely fissured dark grey CLAY locally with grey silt along fissure planes and occasional fossils. (WHITBY MUDSTONE FORMATION)
		7.50	D					
		8.00	SPT	N=37 (4,4/6,8,10,13)				
		9.00	D					
		9.50	SPT	N=34 (4,5/5,7,10,12)				

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. No groundwater encountered. 3. Chiselled from 10.90m to 11.25m for 1.00 hour. 4. Borehole cased to 1.50m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHG024

Sheet 2 of 2

Project Name:	Rail Central		**Co-ords:**	473194E, 255020N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	88.16m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	05/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.50	D					Very stiff extremely closely fissured dark grey CLAY locally with grey silt along fissure planes and occasional fossils. (WHITBY MUDSTONE FORMATION)
		11.00	SPT	N≥50 (10,15/50 for 150mm)	11.00	77.16		Moderately weak grey MUDSTONE. (WHITBY MUDSTONE FORMATION)
		11.25	SPT	N≥50 (25 for 75mm/50 for 75mm)	11.35	76.81		End of Borehole at 11.35m

11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
19.0
20.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. No groundwater encountered. 3. Chiselled from 10.90m to 11.25m for 1.00 hour. 4. Borehole cased to 1.50m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHG025

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472978E, 255548N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	73.96m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	15/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20-0.60	B					Dark brown SILT with frequent rootlets. (TOPSOIL)
					0.60	73.36		
		1.00	D					(Uncompact) black organic SILT with decomposed organic matter. (ALLUVIUM)
		1.20-1.65	B					
		1.20	SPT	N=1 (1,0/1,0,0,0)				
		2.00	D					
		2.00-2.45	U	35 Blows (100% rec)				
					2.40	71.56		
		2.50-3.00	B					Very dense light yellow-brown GRAVEL sized fragments of limestone and siltstone. (MARLSTONE FORMATION)
		3.00	D					
		3.00-3.45	B					
		3.00	SPT	N≥50 (9,10/10,12,13,15)				
					3.60	70.36		
		4.00	D					(Compact) dark grey SILT. (DYRHAM FORMATION)
		4.00-4.45	B					
		4.00	SPT	N=42 (6,5/8,8,10,16)				
		5.00	D					
		5.00	SPT	N≥50 (7,11/50 for 165mm)				
					5.60	68.36		End of Borehole at 5.60m

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. No groundwater encountered. 3. Chiselled from 3.40m to 3.60m for 1.00 hour. 4. Chiselled from 5.50m to 5.60m for 0.50 hour. 5. Borehole cased to 5.60m at 150mm diameter. 6. Borehole backfilled with arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHL001

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472489E, 255446N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	79.08m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	06/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.20-0.60	B		0.20	78.88		Firm brown clay (driller's description). (TOPSOIL)
		1.00	D					Firm light grey mottled yellow-brown very sandy slightly gravelly CLAY. Gravel is angular and subangular medium to coarse sized ironstone. (GLACIOFLUVIAL DEPOSITS)
		1.20-1.65	B					
		1.20	SPT	N=8 (2,2/2,1,2,3)				
		2.00	D		2.00	77.08		
		2.00-2.45	U	40 Blows (100% rec)				Stiff extremely closely fissured bluish grey mottled light brown CLAY. (WHITBY MUDSTONE FORMATION)
		2.50-3.00	B					
		3.00	D					
		3.00-3.45	B					
		3.00	SPT	N=20 (4,3/4,5,6,5)				
		4.00	D					
		4.00-4.45	U	67 Blows (100% rec)				
		5.00	D		5.00	74.08		
		5.00	SPT	N≥50 (6,8/50 for 160mm)				Weak grey MUDSTONE. (WHITBY MUDSTONE FORMATION)
					5.73	73.35		End of Borehole at 5.73m

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. No groundwater encountered. 3. Chiselled from 5.50m to 5.60m for 1.00 hour. 4. Borehole cased to 3.00m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHL002 Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472669E, 255371N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	75.70m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	07/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.20-0.60	B					Firm light brown CLAY with occasional subangular to subrounded fine to coarse sized gravel of flint and frequent rootlets. (MADE GROUND)
		1.00	D		1.00	74.70		
		1.20-1.65 1.20	B SPT	N=7 (1,1/1,2,2,2)				Soft light brown mottled bluish grey CLAY with some gravel of brick fragments. (MADE GROUND)
		2.00	D		2.00	73.70		
		2.00-2.45	U	32 Blows (100% rec)				Stiff bluish grey mottled light brown CLAY. (DYRHAM FORMATION)
		2.50-3.00	B					
		3.00	D					
		3.00-3.45 3.00	B SPT	N=18 (3,5/5,3,5,5)				
		4.00	D		4.00	71.70		
		4.00-4.45 4.00	B SPT	N≥50 (6,10/12,12,14,14)				Very stiff grey CLAY with frequent mudstone fragments. (DYRHAM FORMATION)
		5.00	D		5.00	70.70		
		5.00	SPT	N≥50 (25 for 60mm/50 for 55mm)	5.11	70.59		Weak grey SILTSTONE. (DYRHAM FORMATION) End of Borehole at 5.11m

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Groundwater encountered at 3.40m rising to 1.90m after 20 minutes with 2.00m of casing. 3. Chiselled from 5.00m to 5.30m for 0.50 hour. 4. Borehole cased to 2.00m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHL003

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472549E, 255463N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	78.39m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	06/09/16 - 07/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00-0.50	B					Brown silty SAND with rare gravel of brick fragments. (MADE GROUND)
		0.50-1.00	B					
	▼	1.00-1.45	UT	35 Blows (85% rec)	1.00	77.39		Firm light brown sandy CLAY. (GLACIOFLUVIAL DEPOSITS)
		1.50	D					
		1.75	D					
		2.00	SPT	N=8 (2,2/2,2,2,2)	2.00	76.39		Firm orange-brown mottled bluish grey CLAY with occasional mudstone fragments. (WHITBY MUDSTONE FORMATION)
		2.50	D		2.50	75.89		Stiff thickly laminated very closely fissured grey CLAY with frequent fossils. (WHITBY MUDSTONE FORMATION)
		3.50	D					
		4.00	SPT	N=18 (1,2/3,4,5,6)				
		4.75	D					
		5.00-5.45	UT	50 Blows (90% rec)				
	▽	5.50	D		5.50	72.89		Weak becoming moderately weak dark grey MUDSTONE with occasional fossils. (WHITBY MUDSTONE FORMATION)
		5.50-5.90	D					
		5.90	SPT	N≥50 (25 for 25mm/50 for 25mm)	5.95	72.44		End of Borehole at 5.95m

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0

Remarks: 1. Excavate hand dug inspection pit to 1.00m. 2. Groundwater struck at 5.50m rising to 1.00m after 20 minutes with 1.50m of casing. 3. Chiselled from 5.50m to 5.90m for 1.00 hour. 4. Borehole cased to 1.50m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHL004

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472641E, 255425N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	76.28m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	07/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20-0.60	B		0.20	76.08		Firm brown clay (driller's description). (TOPSOIL)
								Soft orange-brown sandy CLAY. (MARLSTONE FORMATION)
		1.00	D					
		1.20-1.65	B					
		1.20	SPT	N=6 (1,1/1,1,2,2)				
					1.70	74.58		Stiff bluish grey CLAY with occasional fossil remains. (DYRHAM FORMATION)
		2.00	D					
		2.00-2.45	U	35 Blows (100% rec)				
		2.50-3.00	B					
		3.00	D					
		3.00-3.45	B					
		3.00	SPT	N=20 (2,2/3,5,6,6)				
		4.00	SPT	N≥50 (25 for 40mm/50 for 60mm)	4.00	72.28		
					4.10	72.18		Moderately weak grey LIMESTONE. (DYRHAM FORMATION)
								End of Borehole at 4.09m

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. No groundwater encountered. 3. Chiselled from 4.00m to 4.20m for 0.50 hour. 4. Borehole cased to 2.00m at 150mm diameter. 5. Borehole backfilled with arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHL005

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472611E, 255529N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	79.48m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	07/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.00-0.50	B					Firm light brown sandy CLAY with occasional mudstone gravel. (TOPSOIL)
		0.50-1.00	B		0.50	78.98		Firm light brown mottled bluish grey CLAY. (WHITBY MUDSTONE FORMATION)
		1.20-1.65	UT	40 Blows (95% rec)				
		1.70	D		1.70	77.78		Stiff closely fissured light brown mottled bluish grey CLAY with occasional gypsum crystals and fossil remians. (WHITBY MUDSTONE FORMATION)
		2.20-2.65	B					
		2.20	SPT	N≥50 (25 for 75mm/50 for 150mm)	2.40	77.08		Weak light brown LIMESTONE. (MARLSTONE FORMATION)
		3.20-3.65	UT	70 Blows (60% rec)	3.20	76.28		Stiff brownish grey to yellowish brown CLAY. (DYRHAM FORMATION)
		3.60	D		3.65	75.83		Very stiff very closely sheared bluish grey CLAY. (DYRHAM FORMATION)
		3.60-4.20	B					
		4.20-4.65	UT	70 Blows (60% rec)				
		4.60	D					
		4.60-5.20	B					
		5.20	D		5.20	74.28		
		5.20	SPT	N≥50 (25 for 50mm/50 for 25mm)	5.27	74.21		Moderately weak dark grey MUDSTONE. (DYRHAM FORMATION)
								End of Borehole at 5.27m

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. No groundwater encountered. 3. Chiselled from 5.00m to 5.27m for 1.00 hour. 4. Borehole cased to 1.50m at 150mm diameter. 5. Borehole backfilled with arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHL007

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472746E, 255545N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	78.87m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	08/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.20-0.60	B		0.20	78.67		Firm brown clay (driller's description). (MADE GROUND)
		1.00	D					Soft light brown mottled dark brown and red-grey sandy CLAY with some subangular to subrounded fine to coarse gravel of mixed lithology and pockets of red-brown sand. (MADE GROUND)
		1.20-1.65	B					
		1.20	SPT	N=17 (3,7/7,4,4,4,2)				
		2.00	D					
		2.00-2.45	B					
		2.00-2.45	U	35 Blows				
		3.00	D					
		3.00-3.45	B					
		3.00	SPT	N=5 (1,1/1,1,1,2)				
					3.80	75.07		Firm grey CLAY with some angular and subangular fine to coarse sized mudstone fragments. (WHITBY MUDSTONE FORMATION)
		4.00	D		4.00	74.87		Hard grey sandy CLAY. (WHITBY MUDSTONE FORMATION)
		4.00-4.45	B					
		4.00	SPT	N≥50 (6,8/8,12,16,15)				
		5.00	D		5.00	73.87		Weak grey MUDSTONE. (WHITBY MUDSTONE FORMATION)
		5.00	SPT	N≥50 (9,12/50 for 110mm)	5.26	73.61		End of Borehole at 5.26m

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. No groundwater encountered. 3. Chiselled from 5.00m to 5.20m for 0.50 hour. 4. Borehole cased to 4.00m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHL008

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472664E, 255594N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	82.87m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	08/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.00-0.50	B					Very loose to loose brown silty in parts clayey SAND with gravel of mixed lithologies including brick, concrete and plastic fragments, and with some pockets of dark grey clay. (MADE GROUND)
		0.50-1.00	B					
		1.00-1.50	B					
		1.50-2.50 1.50	B SPT	N=4 (2,1/1,1,1,1)				
		2.50-3.50 2.50	B SPT	N=4 (1,1/1,1,1,1)				
		3.50-3.95 3.50	B SPT	N=5 (1,1/1,1,1,2)				
		4.50	SPT	N=10 (2,2/2,2,2,4)	4.70	78.17		
	▼	5.00-5.50	B					Stiff extremely closely fissured bluish grey CLAY. (WHITBY MUDSTONE FORMATION)
		5.50-5.95	UT	70 Blows (90% rec)				
		6.00	D					
		6.50	D					
		7.00-7.70 7.00	B SPT	N=30 (4,4/5,7,9,9)	7.00	75.87		Very stiff bluish grey sandy CLAY. (WHITBY MUDSTONE FORMATION)
		7.70	SPT	N≥50 (25 for 25mm/50 for 25mm)	7.70 7.75	75.17 75.12		Moderately weak grey MUDSTONE. (WHITBY MUDSTONE FORMATION) End of Borehole at 7.75m

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Small seepage at 5.00m. 3. Chiselled from 7.50m to 7.70m for 1.00 hour. 3. borehole cased to 4.50m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHL009

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472665E, 255616N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	83.77m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	08/09/16 - 09/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.00-0.50	B					Dark brown silty SAND with frequent subangular to subrounded fine to coarse sized gravel of flint and occasional brick fragments. (MADE GROUND)
		0.50-1.00	B		0.50	83.27		
		1.00-2.00	B					Soft dark brown sandy CLAY with frequent subangular to subrounded fine to coarse sized gravel of flint and brick fragments. (MADE GROUND)
		1.00	SPT	N=6 (1,1/1,1,2,2)				
		2.00	SPT	N=6 (1,2/1,2,1,2)	2.00	81.77		
		2.50-3.00	B					Soft dark grey sandy CLAY with frequent subangular to subrounded fine to coarse gravel of flint, mudstone and brick fragments. (MADE GROUND)
								.. Between 2.50m and 3.00m, locally hard or dense, driller records obstruction.
		3.00-3.45	B					
		3.00	SPT	N≥50 (10,10/50 for 225mm)				
		4.00-5.00	B		4.00	79.77		Loose to medium dense reddish brown SAND with frequent subrounded fine to medium gravel of mudstone and occasional brick fragments. (MADE GROUND)
		4.00	SPT	N=10 (6,4/3,2,2,3)				
		5.00	SPT	N=9 (3,3/4,1,2,2)	5.00	78.77		Soft dark brown slightly sandy CLAY with gravel of mixed lithologies and brick and occasional timber fragments. (MADE GROUND)
		5.50-6.50	B					
		6.50	SPT	N=6 (3,1/1,1,1,3)				
		7.50	D		7.50	76.27		Stiff bluish grey occasionally orange-brown CLAY with frequent fossils. (WHITBY MUDSTONE FORMATION)
		8.00	SPT	N=43 (4,5/8,9,12,14)				
		8.70-8.90	D		8.70	75.07		Moderately weak dark grey MUDSTONE. (WHITBY MUDSTONE FORMATION)
		8.90	SPT	N≥50 (25 for 25mm/50 for 25mm)	8.95	74.82		End of Borehole at 8.95m

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0

Remarks: 1. Excavate hand dug inspection pit to 1.00m. 2. Groundwater struck at 7.60m rising to 5.50m after 20 minutes with 7.00m of casing. 3. Chiselled from 8.70m to 8.90m for 1.00 hour. 4. Borehole cased to 7.50m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHL010

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472795E, 255628N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	79.68m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	08/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.20-0.60	B		0.20	79.48		Firm brown clay (driller's description). (TOPSOIL)
								Medium dense yellow-brown and brown clayey SAND with frequent gravel of subangular and subrounded fine to coarse sized flint. (GLACIOFLUVIAL DEPOSITS)
		1.00	D					
		1.20-1.65	B					
		1.20	SPT	N=30 (6,8/8,8,7,7)				
		2.00	D					
		2.00-2.45	B					
		2.00	SPT	N=24 (3,5/6,5,6,7)				
		3.00	D					
		3.00-3.45	B					
		3.00	SPT	N=25 (5,5/6,6,6,7)				
		4.00	D					
		4.00-4.45	B					
		4.00	SPT	N=18 (1,2/4,4,4,6)	4.40	75.28		Stiff bluish grey CLAY. (WHITBY MUDSTONE FORMATION)
		5.00	D		5.00	74.68		Very stiff extremely closely fissured bluish grey CLAY with frequent fossils. (WHITBY MUDSTONE FORMATION)
		5.00-5.45	B					
		5.00	SPT	N=42 (4,4/6,9,10,17)				
		5.70	SPT	N≥50 (25 for 59mm/50 for 70mm)	5.70	73.98		Weak grey MUDSTONE. (WHITBY MUDSTONE FORMATION)
					5.82	73.86		End of Borehole at 5.82m

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. No groundwater encountered. 3. Chiselled from 5.50m to 5.70m for 0.50 hour. 4. Borehole cased to 5.00m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHL011

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472870E, 255616N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	77.26m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	09/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.20-0.60	B		0.20	77.06		Firm brown clay (driller's description). (TOPSOIL)
								Firm dark brown sandy CLAY. (TOPSOIL)
					0.60	76.66		Reddish brown silty SAND. (GLACIOFLUVIAL DEPOSITS)
		1.00	D					
		1.20-1.65	B		1.20	76.06		
		1.20	SPT	N=12 (1,2/2,3,4,3)				Firm yellow-brown mottled grey sandy CLAY with some angular to subrounded fine to coarse sized flint gravel and pockets of brown sand. (GLACIOFLUVIAL DEPOSITS)
		2.00	D		2.00	75.26		
		2.00-2.45	U	40 Blows (100% rec)				Stiff dark grey CLAY with some mudstone lithorelicts up to 10mm. (WHITBY MUDSTONE FORMATION)
		2.50-3.00	B					
		3.00	D		3.00	74.26		
		3.00-3.45	B					
		3.00	SPT	N=16 (3,2/3,3,5,5)				Stiff yellow-brown mottled grey slightly sandy CLAY with occasional fossil remains. (MARLSTONE FORMATION)
		4.00	D		4.00	73.26		
		4.00	SPT	N=44 (4,20/19,13,6,6)				Very stiff extremely closely fissured dark grey CLAY with rare mudstone lithorelicts up to 10mm. (DYRHAM FORMATION)
		5.00	D					
		5.00-5.45	B					
		5.00	SPT	N=33 (2,5/5,6,9,13)				
		6.00	SPT	N≥50 (12,13/50 for 30mm)	6.00	71.26		Weak grey MUDSTONE. (DYRHAM FORMATION)
					6.18	71.08		End of Borehole at 6.18m

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. No groundwater encountered. 3. Chiselled from 6.00m to 6.30m for 0.50 hour. 4. Borehole cased to 2.00m at 150mm diameter. 5. Borehole backfilled with arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHR001

Sheet 1 of 2

Project Name:	Rail Central		**Co-ords:**	474144E, 254761N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	90.65m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	26/08/16 - 05/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.15	90.50		Brown stiff grey topsoil rare brick, stone and flint (driller's description). (TOPSOIL)
		0.80	D					Firm brown sandy slightly gravelly CLAY. Gravel is rounded and subrounded fine to coarse sized flint and chalk. (GLACIAL TILL)
		1.10	D		1.00	89.65		
		1.20-1.65	U	8 Blows (100% rec)				Soft light brown sandy CLAY with occasional rounded and subrounded fine sized gravel of mudstone. (GLACIAL TILL)
		1.65-2.10	B		1.50	89.15		Firm extremely closely fissured orange-brown mottled grey CLAY. (GLACIAL TILL)
	▼	2.20	SPT	N=13 (1,2/3,3,3,4)				
					2.50	88.15		Firm orange-brown mottled dark grey CLAY with pockets of orange-brown fine grained sand. (GLACIAL TILL)
		3.00	D		2.90	87.75		Stiff extremely closely fissured dark grey locally mottled orange-brown CLAY. (WHITBY MUDSTONE FORMATION)
		3.30-3.75	U	35 Blows (100% rec)				
		3.75-3.90	D					
		4.00-4.50	B					
		4.55	SPT	N=35 (3,5/5,8,10,12)				*.. Below 4.55m becoming very stiff.*
		5.50	D					*.. Below 5.50m, with occasional mudstone fragments.*
		6.05-6.50	U	42 Blows				
		6.50-6.65	D		6.50	84.15		Very stiff extremely closely fissured dark grey CLAY with occasional mudstone fragments and grey silt along fissure faces. (WHITBY MUDSTONE FORMATION)
		7.00	D					
		7.55	SPT	N=38 (3,5/8,9,10,11)				
		8.25-8.75	B					
		9.05-9.50	U	42 Blows (100% rec)				
		9.15	B					
		9.50-9.65	D					
		10.00-10.50	B					

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Groundwater struck at 2.50m rising to 2.40m after 20 mins with 1.60m of casing. Sealed off at 3.00m. 3. Borehole cased to 4.00m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHR001

Sheet 2 of 2

Project Name:	Rail Central		**Co-ords:**	474144E, 254761N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	90.65m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	26/08/16 - 05/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.70	SPT	N≥50 (6,10/50 for 235mm)				.. *Below 10.70m, becoming hard.*
		11.50	D					
		12.25	SPT	N≥50 (7,10/50 for 225mm)				
		13.00	D					
		13.60	SPT	N≥50 (25 for 26mm/50 for 31mm)	13.65 13.75	77.00 76.90		Moderately weak grey LIMESTONE. (MARLSTONE FORMATION)
		14.00	D					Hard dark grey extremely closely fissured CLAY. (DYRHAM FORMATION)
		15.20	SPT	N≥50 (8,11/50 for 203mm)	15.20	75.45		Weak grey MUDSTONE. (DYRHAM FORMATION)
					15.55	75.10		End of Borehole at 15.55m

11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0 19.0 20.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Groundwater struck at 2.50m rising to 2.40m after 20 mins with 1.60m of casing. Sealed off at 3.00m. 3. Borehole cased to 4.00m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHR003

Sheet 1 of 2

Project Name:	Rail Central		**Co-ords:**	474005E, 253699N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	97.47m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	31/08/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.30-1.20	B		0.30	97.17		Topsoil (driller's description) (MADE GROUND)
		1.20	SPT	N=6 (2,2/1,2,1,2)				Soft dark brown mottled orange-brown slightly sandy CLAY with some subangular and subrounded medium sized gravel of mixed lithology. (MADE GROUND)
		1.70-2.00	B					
		2.00-2.45	U	41 Blows (100% rec)				
		2.45-2.60	D		2.30	95.17		Firm fissured bluish grey mottled greenish grey CLAY. (WHITBY MUDSTONE FORMATION)
		3.00	SPT	N=31 (6,7/8,7,8,8)	3.00	94.47		Very stiff bluish grey CLAY with occasional gypsum crystals. (WHITBY MUDSTONE FORMATION)
		4.00	SPT	N=38 (8,7/8,9,10,11)				
		4.50-5.00	B		4.50	92.97		Hard extremely closely fissured bluish grey CLAY with rare fossil remains and grey silt along fissure faces. (WHITBY MUDSTONE FORMATION)
		5.00	SPT	N≥50 (11,12/12,13,13,13)				
		6.00	SPT	N≥50 (12,12/13,12,13,14)				
		7.00	SPT	N=45 (10,10/11,10,12,12)				
		8.00	SPT	N≥50 (11,11/12,12,13,13)				
		8.50-9.00	B					
		9.00	SPT	N≥50 (10,11/12,14,15,17)				
		10.00	SPT	N≥50 (11,14/14,14,15,18)				

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. No groundwater encountered. 3. Chiselled from 12.10m to 12.50m for 1.5 hours. 4. Borehole cased to 4.00m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHR003

Sheet 2 of 2

Project Name:	Rail Central		**Co-ords:**	474005E, 253699N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	97.47m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	31/08/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		11.00	SPT	N≥50 (10,15/61 for 150mm)				Hard extremely closely fissured bluish grey CLAY with rare fossil remains and grey silt along fissure faces. (WHITBY MUDSTONE FORMATION)
		12.00	SPT	N≥50 (100 for 25mm/86 for 200mm)	12.10	85.37		Weak grey LIMESTONE. (MARLSTONE FORMATION)
		12.50-13.00	B		12.50	84.97		Hard extremely closely fissured dark grey CLAY. (DYRHAM FORMATION)
					13.00	84.47		End of Borehole at 13.00m

11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0 19.0 20.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. No groundwater encountered. 3. Chiselled from 12.10m to 12.50m for 1.5 hours. 4. Borehole cased to 4.00m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHR004

Sheet 1 of 2

Project Name:	Rail Central		**Co-ords:**	473894E, 254198N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	89.89m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	01/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.30-1.20	B		0.30	89.59		Topsoil (driller's description) (TOPSOIL)
		1.20-1.65	U	41 Blows (100% rec)				Firm fissured grey mottled light brown CLAY. (WHITBY MUDSTONE FORMATION)
		1.80-2.00	B					
		2.00	SPT	N=22 (4,5/6,5,5,6)	2.00	87.89		Stiff extremely closely fissured light brown mottled greenish grey CLAY. (WHITBY MUDSTONE FORMATION)
		2.50-3.00	B					
		3.00-3.45	U	54 Blows (100% rec)				
		3.45-3.60	D		3.20	86.69		Very stiff extremely closely fissured bluish grey mottled orange-brown CLAY with occasional mudstone fragments. (WHITBY MUDSTONE FORMATION)
		4.00	SPT	N=33 (8,9/8,8,8,9)				
		5.00	SPT	N=42 (8,10/11,10,10,11)				
		6.00	SPT	N=45 (10,12/11,12,11,11)				
		7.00	SPT	N=45 (9,10/11,11,11,12)	7.00	82.89		Hard extremely closely fissured dark grey CLAY with light grey silt along fissure planes. (WHITBY MUDSTONE FORMATION)
		8.00	SPT	N≥50 (10,11/13,13,13,12)				
		8.50-9.00	B					
		9.00	SPT	N≥50 (11,13/14,15,16,16)				
		10.00	SPT	N≥50 (11,14/66 for 225mm)				

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. No groundwater encountered. 3. Borehole cased to 4.00m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

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Cable Percussion

Borehole No. BHR004

Sheet 2 of 2

Project Name:	Rail Central		**Co-ords:**	473894E, 254198N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	89.89m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	01/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
					10.45	79.44		Hard extremely closely fissured dark grey CLAY with light grey silt along fissure planes. (WHITBY MUDSTONE FORMATION) End of Borehole at 10.45m

11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
19.0
20.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. No groundwater encountered. 3. Borehole cased to 4.00m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHRB02

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472274E, 255141N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	83.80m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	10/10/16 - 11/10/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.20-0.40	B		0.20	83.60		Asphalt. (MADE GROUND)
		0.30	ES					
		0.35-0.80	B		0.40	83.40		Orange-brown slightly clayey slightly sandy GRAVEL and occasional cobbles of subangular and subrounded limestone. (MADE GROUND)
		0.40	ES					
					0.80	83.00		Light brown GRAVEL of limestone. (MADE GROUND)
		0.90	ES					
		1.00	D					Firm multicoloured CLAY with frequent angular and subangular fine to coarse sized gravel and occasional cobbles of limestone. (MADE GROUND)
		1.20-1.65	U	15 Blows (100% rec)	1.20	82.60		
		2.00	D					Firm extremely closely fissured reddish brown mottled bluish grey CLAY with frequent fossil remains. (WHITBY MUDSTONE FORMATION)
		2.20	SPT	N=12 (1,1/2,3,3,4)				
		3.20-3.65	U	50 Blows	3.20	80.60		
		3.20-3.80	B					Very stiff closely fissured bluish grey CLAY with occasional gypsum crystals. (WHITBY MUDSTONE FORMATION)
		4.20-4.65	U	63 Blows (100% rec)				
		4.65-4.75	D		4.60	79.20		
		4.75-4.80	D		4.75	79.05		Weak grey LIMESTONE. (MARLSTONE FORMATION)
		5.00	D					Very weak thickly laminated bluish grey MUDSTONE. (MARLSTONE FORMATION)
		5.30	D					
		5.55	SPT	N≥50 (6,11/50 for 166mm)				
		6.00	SPT	N≥50 (25 for 44mm/50 for 37mm)	6.00	77.80		
					6.08	77.72		Moderately weak grey LIMESTONE. (MARLSTONE FORMATION)
								End of Borehole at 6.08m

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0

Remarks: 1. Break out surface hardstanding using hydraulic breaker. 2. Excavate hand dug inspection pit to 1.20m. 3. Groundwater struck at 4.75m rising to 3.50m after 20 mins with 4.15m of casing. Partially sealed off below 5.00m. 4. Chiselled from 5.90m to 6.00m for 0.50 hour. 5. Borehole cased to 5.95m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHRT01

Sheet 1 of 2

Project Name:	Rail Central		**Co-ords:**	472982E, 254732N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	79.96m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	25/08/16 - 26/08/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.10	D		0.10	79.86		Brown silty clay topsoil (driller's description). (TOPSOIL)
		0.25-0.70	B					Firm orange-brown and grey CLAY with occasional subangular and subrounded fine to medium sized gravel of mudstone and frequent rootlets. (ALLUVIUM)
		0.70-1.00	B					
		1.10	D					
		1.20	SPT	N=10 (1,2/2,2,3,3)				
					1.60	78.36		Firm extremely closely fissured orange-brown mottled dark grey CLAY with frequent mudstone fragments. (WHITBY MUDSTONE FORMATION)
		2.00	D					
		2.20-2.65	UT	33 Blows (100% rec)				
		3.00	D					
		3.30	SPT	N=17 (1,2/3,4,5,5)				*.. Becoming stiff below approximately 3.30m.*
		4.00	D					
		4.30-4.75	U	58 Blows (100% rec)				
		5.00	D		5.00	74.96		Very stiff extremely closely fissured dark grey CLAY with grey silt along fissure faces. (WHITBY MUDSTONE FORMATION)
		5.30	W					
		5.60	SPT	N≥50 (5,7/50 for 283mm)				
		6.50	D					
		7.10	SPT	N≥50 (25 for 106mm/50 for 72mm)	7.20	72.76		Moderately weak grey LIMESTONE. (MARLSTONE FORMATION)
		7.30	D					
		7.35	SPT	N≥50 (25 for 11mm/50 for 15mm)	7.60	72.36		Hard extremely closely fissured dark grey CLAY. (DYRHAM FORMATION)
		8.00	D					
		8.55	SPT	N≥50 (25 for 143mm/50 for 120mm)				
					9.30	70.66		Very weak dark grey MUDSTONE. (DYRHAM FORMATION)
		9.50	D					
		9.90	SPT	N≥50 (25 for 64mm/50 for 36mm)	9.90	70.06		

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Groundwater struck at 7.20m rising to 5.30m after 20 mins with 4.50m of casing. 3. Chiselled from 7.20m to 7.35m for 1.00 hour. 4. Chiselled from 7.35m to 7.55m for 0.50 hour. 5. Chiselled from 9.70m to 9.90m for 0.50 hour. 6. Chiselled from 10.50m to 10.70m for 1.00 hour. 7. Borehole cased to 10.55m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHRT01

Sheet 2 of 2

Project Name:	Rail Central		**Co-ords:**	472982E, 254732N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	79.96m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	25/08/16 - 26/08/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
					10.30	69.66		Moderately weak dark grey MUDSTONE. (DYRHAM FORMATION)
		10.50	D					
		10.70	SPT	N≥50 (25 for 11mm/50 for 15mm)	10.73	69.23		Moderately weak grey SANDSTONE. (DYRHAM FORMATION)
								End of Borehole at 10.73m

11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
19.0
20.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Groundwater struck at 7.20m rising to 5.30m after 20 mins with 4.50m of casing. 3. Chiselled from 7.20m to 7.35m for 1.00 hour. 4. Chiselled from 7.35m to 7.55m for 0.50 hour. 5. Chiselled from 9.70m to 9.90m for 0.50 hour. 6. Chiselled from 10.50m to 10.70m for 1.00 hour. 7. Borehole cased to 10.55m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Cable Percussion

Borehole No. BHRT02

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	473045E, 254695N	**Hole Type:** CP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	80.24m OD	**Scale:** 1:50
Client:	Ashfield Land		**Date(s):**	09/09/16	**Hole Diameter:** 150mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.00-0.50	B					Firm brown CLAY with some mudstone gravel and frequent rootlets. (TOPSOIL)
		0.50-1.00	B		0.50	79.74		Stiff bluish grey CLAY thinly interbedded with pale brown clay and with occasional fossil remains. (WHITBY MUDSTONE FORMATION)
		1.00-1.50	B					
		1.50-1.95	UT	35 Blows (90% rec)				
		2.00	D					
		2.50	SPT	N=16 (1,2/3,4,4,5)				
		3.50-3.95	UT	45 Blows (90% rec)				
		4.00	D		4.00	76.24		Stiff extremely closely fissured bluish grey CLAY with occasional mudstone fragments and crystals of gypsum. (WHITBY MUDSTONE FORMATION)
		4.50	SPT	N=24 (3,4/4,5,6,9)				
		5.50-5.95	UT	80 Blows (80% rec)				
		6.00	D		6.00	74.24		Hard closely fissured bluish grey CLAY with occasional fossil remains. (WHITBY MUDSTONE FORMATION)
		6.50	D					
		7.00	SPT	N≥50 (5,5/10,10,15,15)				
		8.00-8.50	B					
					8.30	71.94		Moderately weak grey MUDSTONE. (WHITBY MUDSTONE FORMATION)
		8.50	SPT	N≥50 (25 for 0mm/50 for 0mm)	8.50	71.74		End of Borehole at 8.50m

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. No groundwater encountered. 3. Chiselled from 8.30m to 8.50m for 1.00 hour. 4. Borehole cased to 1.50m at 150mm diameter.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Windowless Sampler

Borehole No. WSBL01 Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	473954E, 255480N	**Hole Type:** WLS
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	84.70m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	06/06/17	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
					0.20	84.50		TOPSOIL. (MADE GROUND)
		0.30	ES					Dark grey and brown sandy GRAVEL., Gravel is angular and subangular fine and medium ash, and angular fine to coarse of mixed lithologies. (MADE GROUND)
					1.00	83.70		Loose light brown SAND. (GLACIOFLUVIAL DEPOSITS)
		1.20 1.20	D SPT	N=6 (1,1/1,1,2,2)				
		1.50	ES					
		2.00 2.00	D SPT	N=10 (2,2/2,2,3,3)	2.00	82.70		Medium dense light brown gravelly SAND. Gravel is subangular fine of sandstone and mudstone. (GLACIOFLUVIAL DEPOSITS)
		2.50	ES					
		3.00 3.00	D SPT	N=25 (4,4/5,5,5,10)				
		3.50	ES		3.50	81.20		Medium dense light brown SAND. (GLACIOFLUVIAL DEPOSITS)
		4.00 4.00	D SPT	N=25 (4,4/5,5,5,10)				
					4.45	80.25		End of Borehole at 4.45m

1.0 2.0 3.0 4.0 5.0

Remarks: 1) Borehole installed with 150mm diameter plain and slotted monitoring pipe. 2) Borehole backfilled from base with gravel, bentonite and concrete at top.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
FID = Flame Ionization Detector (ppmv)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Groundwater: Dry

Logged: TB **Checked:** RB

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Borehole No. WSBL02

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	473883E, 255387N	**Hole Type:** WLS
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	83.40m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	06/06/17	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.20	83.20		TOPSOIL. (MADE GROUND)
		0.30	ES					Soft brown gravelly sandy CLAY. Gravel is angular fine to coarse of mixed lithologies. (MADE GROUND)
					0.50	82.90		Loose blackish grey GRAVEL of angular fine to medium of ash. (MADE GROUND)
		1.20	D					
		1.20	SPT	N=8 (2,2/2,2,2,2)				
		1.50	ES					
		2.00	D					
		2.00	SPT	N=6 (2,2/1,2,1,2)				
		2.50	ES					
		3.00	D					
		3.00	SPT	N=3 (1,0/1,0,1,1)				
		3.50	ES					
					3.60	79.80		Light brown SAND. (GLACIOFLUVIAL DEPOSITS)
		4.00	D		4.00	79.40		End of Borehole at 4.00m

1.0 2.0 3.0 4.0 5.0

Remarks: 1) Borehole backfilled with lightly compacted arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
FID = Flame Ionization Detector (ppmv)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Groundwater: Dry

Logged: TB **Checked:** RB

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Borehole No. WSBL03 Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	473872E, 255226N	**Hole Type:** WLS
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	83.30m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	06/06/17	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
								Grey clayey gravelly SAND. Gravel is subangular fine to coarse of sandstone and brick fragments. (MADE GROUND)
					0.50	82.80		Loose light brown SAND. (GLACIOFLUVIAL DEPOSITS)
		1.20 1.20 1.20	D ES SPT	N=5 (1,0/1,1,1,2)				
		2.00 2.00	D SPT	N=9 (1,2/2,2,3,2)				
		2.50	ES					
		3.00 3.00	D SPT	N=16 (2,3/3,4,4,5)				*.. becoming medium dense below 3.00m.*
					3.45	79.85		End of Borehole at 3.45m

1.0 2.0 3.0 4.0 5.0

Remarks: 1) Borehole installed with 150mm diameter plain and slotted monitoring pipe. 2) Borehole backfilled from base with gravel, bentonite and concrete at top.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
FID = Flame Ionization Detector (ppmv)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Groundwater: Dry

Logged: TB **Checked:** RB

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Borehole No. WSBL04 Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	473886E, 255076N	**Hole Type:** WLS
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	82.00m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	06/06/17	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
					0.20	81.80		TOPSOIL. (TOPSOIL)
		1.20 1.20 1.20	D ES SPT	N=6 (1,2/1,2,1,1,2)				Soft light brown and light grey mottled slightly sandy CLAY. (GLACIOFLUVIAL DEPOSITS)
		2.00 2.00	D SPT	N=9 (1,2/2,3,2,2)	2.00	80.00		Firm grey mottled reddish brown sandy CLAY. (GLACIOFLUVIAL DEPOSITS)
	▼	2.50	ES		2.50	79.50		Medium dense light brown slightly gravelly SAND. Gravel is angular to subangular fine of sandstone. (GLACIOFLUVIAL DEPOSITS)
		3.00 3.00	D SPT	N=11 (2,3/2,3,3,3)				
					3.45	78.55		End of Borehole at 3.45m

1.0 2.0 3.0 4.0 5.0

Remarks: 1) Borehole backfilled with lightly compacted arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
FID = Flame Ionization Detector (ppmv)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Groundwater: Groundwater encountered at 2.50m.

Logged: TB **Checked:** RB

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Borehole No. WSBL05 Sheet 1 of 2

Project Name:	Rail Central		**Co-ords:**	474070E, 255087N	**Hole Type:** WLS
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	83.00m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	06/06/17	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
					0.20	82.80		TOSPOIL. (MADE GROUND)
								Soft dark grey gravelly sandy CLAY. Gravel is angular to subangular fine to coarse of limestone, sandstone and ash. (MADE GROUND)
		1.20	SPT	N=4 (1,1/1,1,1,1)				
		1.30	ES		1.40	81.60		
								Soft light grey mottled light brown slightly gravelly sandy CLAY. Gravel is angular to subangular fine to medium of mixed lithologies. (MADE GROUND)
		2.00	SPT	N=4 (1,1/1,1,1,1)				
		2.50	ES					
		3.00	D					
		3.00	SPT	N=8 (2,2/2,2,2,2)				
		3.50	ES					
		4.00	SPT	N=8 (2,2/2,2,2,2)				
		4.50	ES		4.50	78.50		Dense light brown slightly clayey SAND. (GLACIOFLUVIAL DEPOSITS)
		5.00	D					
		5.00	SPT	N=38 (5,7/15,6,10,7)				

1.0 2.0 3.0 4.0 5.0

Remarks: 1) Borehole installed with 150mm diameter plain and slotted monitoring pipe. 2) Borehole backfilled from base with gravel, bentonite and concrete at top.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
FID = Flame Ionization Detector (ppmv)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Groundwater: Dry

Logged: TB **Checked:** RB

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Windowless Sampler

Borehole No. WSBL05

Sheet 2 of 2

Project Name:	Rail Central		**Co-ords:**	474070E, 255087N	**Hole Type:** WLS
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	83.00m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	06/06/17	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
					5.45	77.55		Dense light brown slightly clayey SAND. (GLACIOFLUVIAL DEPOSITS) End of Borehole at 5.45m

6.0
7.0
8.0
9.0
10.0

Remarks: 1) Borehole installed with 150mm diameter plain and slotted monitoring pipe. 2) Borehole backfilled from base with gravel, bentonite and concrete at top.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
FID = Flame Ionization Detector (ppmv)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Groundwater: Dry

Logged: TB **Checked:** RB

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Borehole No. WSBL06

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	473940E, 255158N	**Hole Type:** WLS
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	84.00m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	06/06/17	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
								Soft brown gravelly sandy CLAY. Gravel is angular to subangular fine to coarse brick fragments and concrete fragments. (MADE GROUND)
		1.20	ES		1.20	82.80		Soft brown and blackish grey gravelly silty CLAY. Gravel is angular to subangular fine to coarse of mixed lithologies. (MADE GROUND)
		3.00	ASB					*Suspected asbestos containing material recovered at 3.00m.*
					4.00	80.00		Light brown and light grey SAND. (GLACIOFLUVIAL DEPOSITS)
		4.30	ES					
					4.50	79.50		End of Borehole at 4.50m

1.0 2.0 3.0 4.0 5.0

Remarks: 1) Borehole installed with 150mm diameter plain and slotted monitoring pipe. 2) Borehole backfilled from base with gravel, bentonite and concrete at top.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
FID = Flame Ionization Detector (ppmv)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Groundwater: Dry

Logged: TB **Checked:** RB

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Borehole No. WSBL07

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	474020E, 255208N	**Hole Type:** WLS
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	87.20m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	06/06/17	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
					0.20	87.00		TOPSOIL. (MADE GROUND)
								Soft brown grey and black gravelly sandy CLAY. Gravel is angular to subangular fine to coarse of brick fragments, concrete fragments, sandstone and wood. (MADE GROUND)
					1.00	86.20		
		1.20	ES					Red and brown sandy GRAVEL. Gravel is angular to subangular fine to coarse of ash, mudstone and brick fragments. (MADE GROUND)
		2.50	ES					
		3.00	D		3.00	84.20		
		3.50	ES					Soft grey gravelly sandy CLAY. Gravel is angular to subangular fine to coarse of ash, mudstone and brick fragments. (MADE GROUND)
					4.00	83.20		End of Borehole at 4.00m

1.0
2.0
3.0
4.0
5.0

Remarks: 1) Borehole backfilled with lightly compacted arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
FID = Flame Ionization Detector (ppmv)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Groundwater: Dry

Logged: TB **Checked:** RB

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Borehole No. WSBL08

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	474004E, 255280N	**Hole Type:** WLS
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	87.00m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	06/06/17	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
					0.20	86.80		TOPSOIL. (MADE GROUND)
								Soft brown and blackish grey gravelly silty CLAY. Gravel is angular to subangular fine to coarse of brick fragments, concrete fragments and sandstone. (MADE GROUND)
		1.20	D					
		1.20	SPT	N=10 (1,1/2,2,3,3)				
		1.50	ES					
		2.00	D					
		2.00	SPT	N=8 (1,1/2,2,2,2)				
		2.50	ES					
		3.00	SPT	N≥50 (5,5/10,10,15,15)				.. at 3.00m, very hard / dense obstruction encountered.
					3.45	83.55		End of Borehole at 3.45m

1.0 2.0 3.0 4.0 5.0

Remarks: 1) Borehole backfilled with lightly compacted arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
FID = Flame Ionization Detector (ppmv)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Groundwater: Dry

Logged: TB **Checked:** RB

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Borehole No. WSBL09 Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	473926E, 255288N	**Hole Type:** WLS
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	85.70m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	06/06/17	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
					0.20	85.50		TOPSOIL. (MADE GROUND)
								Light brown gravelly clayey SAND. Gravel is subangular fine to coarse of mixed lithologies. (MADE GROUND)
		1.20	ES		1.20	84.50		Soft yellowish grey gravelly sandy CLAY. Gravel is subangular fine to coarse of brick fragments and concrete fragments. (MADE GROUND)
					1.80	83.90		Dark grey clayey GRAVEL of angular to subangular fine to medium ash. (MADE GROUND)
		2.20	ES					
					2.50	83.20		Soft yellowish grey gravelly sandy CLAY. Gravel is subangular fine to coarse of brick, sandstone and concrete. (MADE GROUND)
		3.20	ES					
					3.60	82.10		Brown SAND. (GLACIOFLUVIAL DEPOSITS)
		4.50	ES		4.50	81.20		Light brown SAND. (GLACIOFLUVIAL DEPOSITS)
					5.00	80.70		End of Borehole at 5.00m

1.0 2.0 3.0 4.0 5.0

Remarks: 1) Borehole installed with 150mm diameter plain and slotted monitoring pipe. 2) Borehole backfilled from base with gravel, bentonite and concrete at top.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
FID = Flame Ionization Detector (ppmv)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Groundwater: Dry

Logged: TB **Checked:** RB

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Borehole No. WSBL10 Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	473980E, 255420N	**Hole Type:** WLS
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	86.40m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	06/06/17	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.30	ES		0.20	86.20		TOPSOIL. (MADE GROUND)
					1.20	85.20		Soft dark brown gravelly sandy CLAY. Gravel is angular to subangular fine to coarse of brick fragments, concrete fragments and sandstone. (MADE GROUND)
		1.50	ES					Soft light and dark brown gravelly sandy CLAY. Gravel is subangular fine to medium of brick, sandstone and mudstone. (MADE GROUND)
		2.50	ES					
					4.00	82.40		End of Borehole at 4.00m

1.0 2.0 3.0 4.0 5.0

Remarks: 1) Borehole backfilled with lightly compacted arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
FID = Flame Ionization Detector (ppmv)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Groundwater: Dry

Logged: TB **Checked:** RB

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Borehole No. WSCL001 Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	473875E, 254563N	**Hole Type:** WS
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	84.30m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	20/09/16	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	ES		0.30	84.00		Topsoil. (TOPSOIL)
		0.50	B					Firm to stiff orange brown slightly gravelly CLAY with occasional rootlets. Gravel is subangular and subrounded fine to coarse of chert and mudstone. (WHITBY MUDSTONE FORMATION)
		1.00	B					
		1.20	SPT	N=11 (2,2/3,2,3,3)				
					1.40	82.90		Stiff orange brown and grey slightly calcareous slightly gravelly CLAY with occasional silt grade gypsum crystals. Gravel is subangular and subrounded fine to coarse of mudstone. (WHITBY MUDSTONE FORMATION)
		2.00	SPT	N=15 (1,2/3,4,4,4)				
		2.10-3.00	B		2.10	82.20		Stiff laminated grey locally grey and greyish brown slightly gravelly calcareous CLAY with occasional silt grade to 4mm gypsum crystals. Gravel is subangular and subrounded fine to coarse of mudstone and quartzite with rare cobbles. (WHITBY MUDSTONE FORMATION)
		3.00	SPT	N=21 (2,2/5,5,5,6)				
		4.00	SPT	N=21 (2,3/4,5,5,7)	4.00	80.30		End of Borehole at 4.00m

1.0 2.0 3.0 4.0 5.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Borehole backfilled with arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
FID = Flame Ionization Detector (ppmv)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Groundwater: No groundwater encountered.

Logged: MOB **Checked:** RB

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Window Sampler

Borehole No. WSCL002 Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	473753E, 254492N	**Hole Type:** WS
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	84.10m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	20/09/16	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.20	ES		0.30	83.80		Topsoil. (TOPSOIL)
		0.50	B					Firm to stiff grey and orange brown slightly gravelly CLAY with occasional rootlets and occasional silt grade gypsum crystals. Gravel is subangular and subrounded fine to coarse of chert and mudstone with rare cobbles. (WHITBY MUDSTONE FORMATION)
		1.00	B					
		1.20	SPT	N=15 (1,2/3,3,4,5)				*.. below 1.20m, becoming grey and orangeish brown.*
		1.60-1.70	D					
		2.00-3.00	B		2.00	82.10		
		2.00	SPT	N=18 (2,2/3,5,5,5)				Stiff laminated grey locally orange brown and grey slightly gravelly calcareous CLAY with occasional silt grade to 12mm gypsum crystals. Gravel is subangular and subrounded mudstone with rare cobbles. (WHITBY MUDSTONE FORMATION)
		3.00	SPT	N=24 (2,3/5,5,7,7)				
		3.50-3.70	D					
		4.00	SPT	N=23 (3,3/6,5,5,7)	4.00	80.10		End of Borehole at 4.00m

1.0 2.0 3.0 4.0 5.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Borehole backfilled with arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
FID = Flame Ionization Detector (ppmv)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Groundwater: No groundwater encountered.

Logged: MOB **Checked:** RB

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Borehole No. WSCL003 Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	473691E, 254615N	**Hole Type:** WS
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	82.60m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	20/09/16	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.20	ES		0.30	82.30		Topsoil. (TOPSOIL)
		0.50	B		0.60	82.00		Firm to stiff orange brown slightly gravelly CLAY with occasional rootlets and occasional silt grade gypsum crystals. Gravel is subangular and subrounded fine to coarse of chert and mudstone with rare cobbles. (WHITBY MUDSTONE FORMATION)
		1.00	B					Stiff orange brown and grey calcareous CLAY with occasional silt grade to 5mm gypsum crystals. Gravel is subangular and subrounded fine to coarse of mudstone with rare cobbles. (WHITBY MUDSTONE FORMATION)
		1.20	SPT	N=11 (1,2/2,2,3,4)				
		2.00-3.00	B		2.00	80.60		Stiff laminated grey locally grey and orange brown slightly gravelly calcareous CLAY with occasional silt grade to 4mm gypsum crystals. Gravel is subangular and subrounded fine to coarse of mudstone and quartzite with occasional cobbles. (WHITBY MUDSTONE FORMATION)
		2.00	SPT	N=15 (2,2/3,3,4,5)				
		3.00	SPT	N=23 (3,3/6,5,6,6)				
		4.00	SPT	N=24 (2,3/5,6,6,7)	4.00	78.60		End of Borehole at 4.00m

1.0 2.0 3.0 4.0 5.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Borehole backfilled with arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
FID = Flame Ionization Detector (ppmv)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Groundwater: No groundwater encountered.

Logged: MOB **Checked:** RB

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Borehole No. WSCL004 Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	473526E, 254488N	**Hole Type:** WS
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	84.50m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	20/09/16	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	ES		0.30	84.20		Topsoil. (TOPSOIL)
		0.50	B		0.60	83.90		Firm to stiff orange brown slightly gravelly CLAY with occasional rootlets and occasional silt grade gypsum crystals. Gravel is subangular and subrounded fine to coarse of chert and mudstone with occasional cobbles. (WHITBY MUDSTONE FORMATION)
		1.00	B					Stiff laminated grey locally grey and orange brown slightly gravelly calcareous CLAY with occasional silt grade to 6mm gypsum crystals. Gravel is subangular and subrounded fine to coarse of mudstone and quartzite with occasional cobbles. (WHITBY MUDSTONE FORMATION)
		1.20	SPT	N=13 (2,2/3,3,4,3)				
		2.00-3.00	B					
		2.00	SPT	N=19 (2,2/4,5,5,5)				
		3.00-4.00	B					
		3.00	SPT	N=21 (2,3/4,5,6,6)				
		4.00	SPT	N=22 (3,3/5,5,6,6)	4.00	80.50		End of Borehole at 4.00m

1.0 2.0 3.0 4.0 5.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Borehole backfilled with arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
FID = Flame Ionization Detector (ppmv)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Groundwater: No groundwater encountered.

Logged: MOB **Checked:** RB

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Borehole No. WSLF001 Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	474095E, 254862N	**Hole Type:** WS
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	87.65m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	21/09/16	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.30	ES		0.30	87.35		Topsoil. (TOPSOIL)
		0.50	B					Firm brown slightly gravelly slightly sandy CLAY with occasional rootlets. Gravel is subangular and subrounded fine and medium of sandstone and chert. (GLACIAL TILL)
					0.70	86.95		Firm to stiff orange brown slightly gravelly sandy silty CLAY. Gravel is subangular to rounded fine to coarse of chert and sandstone. (GLACIAL TILL)
		1.00	B					
		1.20	SPT	N=16 (1,2/3,4,4,5)				
		1.40-1.60	D					*.. below 1.40m, becoming grey and orangeish brown.*
					1.90	85.75		Stiff laminated grey locally orange brown and grey slightly gravelly slightly calcareous CLAY with occasional silt grade to 13mm gypsum crystals. Gravel is subangular to rounded fine to coarse mudstone with occasional cobbles. (WHITBY MUDSTONE FORMATION)
		2.00-3.00	B					
		2.00	SPT	N=14 (2,2/3,3,4,4)				
		3.00	SPT	N=18 (2,2/3,4,5,6)				
		3.40-3.60	D					
		4.00	SPT	N=26 (2,3/4,6,8,8)	4.00	83.65		End of Borehole at 4.00m

1.0 2.0 3.0 4.0 5.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Borehole backfilled with arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
FID = Flame Ionization Detector (ppmv)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Groundwater: No groundwater encountered.

Logged: MOB **Checked:** RB

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Borehole No. WSLF002

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	474116E, 254817N	**Hole Type:** WS
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	88.70m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	21/09/16	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	ES					Firm brown slightly sandy gravelly CLAY. Gravel is subangular to rounded fine to coarse of chert, sandstone, brick and concrete. Very slight chemical odour. (MADE GROUND)
		0.50	B		0.60	88.10		
		1.00	B					Firm to stiff grey and orangeish grey slightly gravelly CLAY. Gravel is subangular and subrounded fine to coarse of chert. (GLACIAL TILL)
		1.20-1.30 1.20	ES SPT	N=15 (1,2/4,4,3,4)				
		2.00	SPT	N=15 (1,2/4,4,3,4)	2.40	86.30		Stiff laminated grey locally orangeish brown and grey slightly calcareous slightly gravelly CLAY with occasional silt grade to 6mm gypsum crystals. Gravel is subangular and subrounded fine to coarse of mudstone with occasional cobbles. (WHITBY MUDSTONE FORMATION)
		2.80-3.00	D					
		3.00	SPT	N=17 (2,2/4,4,4,5)				
		3.50-3.60	D					
		4.00	SPT	N=18 (2,2/4,4,5,5)	4.00	84.70		End of Borehole at 4.00m

1.0 2.0 3.0 4.0 5.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Borehole backfilled with arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
FID = Flame Ionization Detector (ppmv)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Groundwater: No groundwater encountered.

Logged: MOB **Checked:** RB

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Borehole No. WSLF003 Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	474091E, 254829N	**Hole Type:** WS
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	88.20m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	21/09/16	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	ES					Grass over black sandy GRAVEL of angular to subangular fine to coarse ash and clinker with occasional whole and half bricks. (MADE GROUND)
		0.50	B					
		1.20	SPT	N=5 (2,2/2,1,1,1)				
		1.30-1.40	ES		1.40	86.80		Firm to stiff grey and orangeish grey slightly gravelly CLAY. Gravel is subangular and subrounded fine to coarse of chert. (GLACIAL TILL)
		2.00-3.00	B		1.80	86.40		Stiff laminated grey locally orangeish brown and grey slightly calcareous slightly gravelly CLAY with occasional silt grade to 6mm gypsum crystals. Gravel is subangular and subrounded fine to coarse of mudstone with occasional cobbles. (WHITBY MUDSTONE FORMATION)
		2.00	SPT	N=13 (1,2/4,3,3,3)				
		3.00	SPT	N=19 (2,3/4,4,5,6)				
		4.00	SPT	N=20 (2,3/4,5,5,6)	4.00	84.20		End of Borehole at 4.00m

1.0 2.0 3.0 4.0 5.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Borehole backfilled with arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
FID = Flame Ionization Detector (ppmv)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Groundwater: No groundwater encountered.

Logged: MOB **Checked:** RB

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Borehole No. WSLF004 Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	474042E, 254803N	**Hole Type:** WS
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	88.20m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	21/09/16	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.20	ES		0.30	87.90		Dark brown to black very gravelly fine to coarse SAND. Gravel is angular to subrounded fine to coarse of limestone, ash and clinker. Strong odour of creosote. (MADE GROUND)
		0.50	B					Dark brown and black sandy GRAVEL of angular medium and coarse limestone (rail ballast) with frequent wood fragments (approx 90mm by 30mm). Very strong creosote odour. (MADE GROUND)
		1.00	B		0.90	87.30		Firm to stiff grey and orange brown slightly sandy gravelly CLAY. Gravel is subangular to rounded fine to coarse of chert. (GLACIAL TILL)
		1.20	SPT	N=13 (2,3/2,2,3,6)				
		1.40-1.60	ES					
		2.00-3.00	B		1.90	86.30		Stiff laminated grey locally orange brown and grey slightly calcareous slightly gravelly CLAY with occasional silt grade to 8mm gypsum crystals. Gravel is subangular and subrounded fine to coarse of mudstone with rare cobbles. (WHITBY MUDSTONE FORMATION)
		2.00	SPT	N=14 (2,3/3,3,4,4)				
		3.00	SPT	N=19 (2,3/4,5,5,5)				
		4.00	SPT	N=21 (3,3/5,6,5,5)	4.00	84.20		End of Borehole at 4.00m

1.0 2.0 3.0 4.0 5.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Borehole backfilled with arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
FID = Flame Ionization Detector (ppmv)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Groundwater: No groundwater encountered.

Logged: MOB **Checked:** RB

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Borehole No. WSLF005 Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	474061E, 254722N	**Hole Type:** WS
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	88.40m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	21/09/16	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	ES					Firm to stiff orange brown slightly sandy slightly gravelly CLAY with occasional rootlets. Gravel is subangular and subrounded fine to coarse of chert. (MADE GROUND)
		0.50	B					*.. at 0.30m, 2 No 80mm by 100mm fragments of possible cement bonded asbestos.*
		1.20	SPT	N=11 (2,2/3,2,3,3)	1.30	87.10		Firm to stiff light brown and light grey slightly gravelly CLAY. Gravel is subangular and subrounded fine and medium of chert. (GLACIAL TILL)
		1.50-1.70	D					
		2.00	SPT	N=20 (2,3/6,6,4,4)				
		2.80-3.00	D		2.55	85.85		Brownish orange gravelly fine and medium SAND. Gravel is angular and subangular fine to coarse of ironstone with occasional cobbles. (GLACIAL TILL)
		3.00	SPT	N=20 (3,3/5,5,5,5)				
		4.00	SPT	N=26 (4,5/5,7,7,7)	3.20	85.20		Stiff laminated grey locally orange brown and grey slightly gravelly slightly calcareous CLAY with occasional silt grade to 3mm gypsum crystals. Gravel is subangular to rounded fine to coarse mudstone. (WHITBY MUDSTONE FORMATION)
					4.00	84.40		End of Borehole at 4.00m

1.0 2.0 3.0 4.0 5.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Borehole backfilled with arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
FID = Flame Ionization Detector (ppmv)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Groundwater: No groundwater encountered.

Logged: MOB **Checked:** RB

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Borehole No. WSS001 Sheet 1 of 1

Project Name: Rail Central		**Co-ords:** 472269E, 255111N	**Hole Type:** WS
Location: Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:** 83.07m OD	**Scale:** 1:25
Client: Ashfield Land		**Date(s):** 05/10/16	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
					0.20	82.87		Asphalt (MADE GROUND)
		0.30	ES					Dark brown very sandy GRAVEL. Gravel is angular fine to coarse of granite and limestone with occasional pebbles. (MADE GROUND)
								.. below 0.50m, becoming greyish brown slightly clayey.
					0.70	82.37		Brown very clayey sandy GRAVEL. Gravel is angular and subangular fine to coarse of limestone granite and concrete with occasional pebbles. (MADE GROUND)
					0.90	82.17		Firm light orangeish brown and light grey locally slightly gravelly CLAY. Gravel is angular and subangular fine to coarse of concrete, limestone and ironstone with rare (<1mm by 40mm) rootlets. (MADE GROUND)
		1.20-1.65 1.20	D SPT	N=12 (1,2/3,2,3,4)				
		1.25	ES					
					1.70	81.37		Stiff thinly interbedded light grey and orangeish brown locally slightly gravelly CLAY. Gravel is subangular and subrounded fine and medium of limestone and mudstone. (WHITBY MUDSTONE FORMATION)
		1.90	SPT	N=37 (25 for 70mm/24,6,3,4)				
		2.00-2.45	D					*.. between 2.00m and 2.20m, orangish brown very sandy gravel of angular and subangular fine to coarse limestone.*
		2.80-3.00	B					*.. below 2.70m, becoming thinly laminated.*
		3.00-3.45 3.00	D SPT	N≥50 (16 for 832mm/41 for 230mm)				
					3.20	79.87		Hard brown, orange-brown and mid grey sandy CLAY with some gravel of angular fine to coarse limestone fragments and whole shell fossils. (MARLSTONE FORMATION)
		4.00-4.45 4.00	D SPT	N≥50 (6,7/50 for 225mm)				
					4.30	78.77		End of Borehole at 4.20m

1.0 2.0 3.0 4.0 5.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
FID = Flame Ionization Detector (ppmv)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Groundwater: No groundwater encountered.

Logged: MOB **Checked:** RB

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Borehole No. WSS002 Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472264E, 255101N	**Hole Type:** WS
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	83.00m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	05/10/16	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
					0.20	82.80		Asphalt (MADE GROUND)
		0.40	ES					Grey very sandy GRAVEL of angular and subangular fine to coarse of limestone granite and concrete with occasional cobbles. (MADE GROUND) *.. below 0.50m, becoming red and grey with brick fragments.*
					0.70	82.30		*.. below 0.60m, becoming very clayey.*
					1.00	82.00		Firm orangeish brown sandy locally slightly gravelly CLAY. Gravel is subangular and subrounded fine and medium of limestone and brick fragments. (MADE GROUND)
		1.30	ES					Firm grey and orangeish brown locally slightly gravelly CLAY. Gravel is subangular and subrounded fine and medium of limestone. (WHITBY MUDSTONE FORMATION) *.. below 1.40m, becoming stiff.*
		1.80-1.90	D		1.70	81.30		Very stiff orangeish brown and grey slightly sandy locally slightly gravelly CLAY. Gravel is subangular and subrounded fine and medium of limestone. (WHITBY MUDSTONE FORMATION)
					1.90	81.10		End of Borehole at 1.90m

1.0 2.0 3.0 4.0 5.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Borehole backfilled with arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
FID = Flame Ionization Detector (ppmv)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Groundwater: No groundwater encountered.

Logged: MOB **Checked:** RB

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Borehole No. WSS003 Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472277E, 255094N	**Hole Type:** WS
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	83.15m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	05/10/16	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
					0.20	82.95		Asphalt (MADE GROUND)
					0.40	82.75		Grey very sandy GRAVEL of angular and subangular fine to coarse of limestone granite with occasional cobbles. (MADE GROUND)
		0.50	ES					Light orangeish brown very gravelly fine to coarse SAND. Gravel is angular to subrounded fine to coarse of limestone and granite with occasional cobbles. (MADE GROUND)
					0.70	82.45		*.. below 0.60m, becoming clayey.*
		1.20 1.20-1.60	ES B		1.10	82.05		Firm brown slightly gravelly slightly sandy CLAY with rare silt grade gypsum crystals. Gravel is angular to subrounded fine to coarse of limestone and granite. (MADE GROUND)
					1.70	81.45		Firm light grey and orangeish brown locally slightly gravelly CLAY with occasional rootlets (1mm by 30 to 40mm) and rare silt grade gypsum crystals. Gravel is subangular and subrounded fine and medium of limestone. (WHITBY MUDSTONE FORMATION)
								.. below 1.20m, rootlets becoming absent.
					2.00	81.15		*.. below 1.30m, becoming stiff.*
					2.30	80.85		Very stiff grey and orangeish brown slightly sandy locally slightly gravelly CLAY with occasional pockets of black clay and rare silt grade gypsum crystals. Gravel is subangular and subrounded fine and medium of limestone. (WHITBY MUDSTONE FORMATION)
								.. below 1.90m, pockets becoming absent.
								Light grey and orangeish brown sandy GRAVEL of angular to subrounded fine to coarse limestone. (MARLSTONE FORMATION)
								Stiff grey and orangeish brown locally slightly gravelly CLAY. Gravel is angular to subrounded fine to medium of limestone. (MARLSTONE FORMATION)
								.. below 2.90m, becoming sandy.
					3.20	79.95		End of Borehole at 3.20m

1.0 2.0 3.0 4.0 5.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Borehole backfilled with arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
FID = Flame Ionization Detector (ppmv)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Groundwater: No groundwater encountered.

Logged: MOB **Checked:** RB

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Borehole No. WSS004 Sheet 1 of 2

Project Name: Rail Central		**Co-ords:** 472229E, 255083N	**Hole Type:** WS
Location: Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:** 83.68m OD	**Scale:** 1:25
Client: Ashfield Land		**Date(s):** 05/10/16	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
					0.05	83.63		Asphalt (MADE GROUND)
								Concrete. (MADE GROUND)
		0.35	ES		0.30	83.38		Grey very sandy GRAVEL of angular and subangular fine to coarse of limestone granite and concrete. (MADE GROUND)
								.. below 0.50m, becoming greyish brown slightly clayey with frequent limestone cobbles.
					0.70	82.98		Firm grey and light brown slightly sandy slightly gravelly CLAY. Gravel is angular and subrounded fine to coarse of limestone. (WHITBY MUDSTONE FORMATION)
		1.20-1.65	D					*.. below 0.90m, occasional rootlets (<1mm by 40 to 60mm).*
		1.20	SPT	N=12 (2,2/3,2,3,4)				*.. below 1.20m, rootlets becoming absent.*
		1.25	ES					*.. below 1.40m, occasional 2mm by 3mm Echinoderm fossils.*
		2.00-2.45	D					
		2.00-2.70	B					
		2.00	SPT	N=11 (1,1/2,2,2,5)				
					2.50	81.18		Light grey sandy GRAVEL of angular to subrounded fine to coarse of limestone. (MARLSTONE FORMATION)
		2.60-3.05	D					
		2.60	SPT	N=25 (25 for 105mm/6,6,6,7)	2.70	80.98		Stiff brown and orangeish brown locally slightly gravelly CLAY with occasional silt grade to 2mm gypsum crystals and occasional 1mm to 2mm pockets of black clay. Gravel is subangular and subrounded fine to coarse of limestone. (MARLSTONE FORMATION)
		3.00-3.45	D					
		3.00	SPT	N=25 (4,4/5,6,6,8)				
								.. below 3.50m, black clay becoming absent.
		4.00-4.45	D					
		4.00	SPT	N=43 (25 for 130mm/16,12,7,8)	4.10	79.58		
					4.20	79.48		Light grey sandy GRAVEL of angular to subrounded fine to coarse of limestone. (MARLSTONE FORMATION)
								Very stiff thinly laminated orangeish brown and grey CLAY with occasional silt grade to 15mm gypsum crystals. (DYRHAM FORMATION)
		5.00-5.45	D					
		5.00	SPT	N≥50 (13,12/50 for 30mm)				

1.0 2.0 3.0 4.0 5.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
FID = Flame Ionization Detector (ppmv)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Groundwater: No groundwater encountered.

Logged: MOB **Checked:** RB

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Borehole No. WSS004

Sheet 2 of 2

Project Name:	Rail Central		**Co-ords:**	472229E, 255083N	**Hole Type:** WS
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	83.68m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	05/10/16	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
								.. at 5.00m, gypsum absent in SPT sample, occasional red iron staining.
					5.45	78.23		End of Borehole at 5.45m

6.0
7.0
8.0
9.0
10.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
FID = Flame Ionization Detector (ppmv)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Groundwater: No groundwater encountered.

Logged: MOB **Checked:** RB

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Borehole No. WSS005 Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472254E, 255127N	**Hole Type:** WS
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	83.58m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	06/10/16	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
					0.20	83.38		Asphalt (MADE GROUND)
					0.40	83.18		Grey very sandy GRAVEL of angular to subrounded fine to coarse of limestone brick fragments and concrete. (MADE GROUND)
		0.50	ES					Red slightly sandy GRAVEL of angular and subangular fine to coarse of limestone and brick fragments. (MADE GROUND)
					0.90	82.68		Firm light grey and orangeish brown slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse of brick fragments and limestone. (MADE GROUND)
					1.10	82.48		Stiff orangeish brown and grey locally slightly gravelly CLAY with occasional pockets (1mm to 2mm) of black clay. Gravel is subangular and subrounded fine and medium of limestone and mudstone. (WHITBY MUDSTONE FORMATION)
		1.25	ES					
		2.00	B					*.. below 2.10m, occasional orange red iron staining.*
								.. below 2.60m, frequent silt grade to fine sand grade gypsum crystals.
					2.90	80.68		Very stiff grey and brownish grey CLAY with occasional silt grade gypsum crystals and occasional light brown (<1mm) shell fragments. (WHITBY MUDSTONE FORMATION)
					3.00	80.58		End of Borehole at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Borehole backfilled with arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
FID = Flame Ionization Detector (ppmv)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Groundwater: No groundwater encountered.

Logged: MOB **Checked:** RB

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Window Sampler

Borehole No. WSS006

Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472265E, 255077N	**Hole Type:** WS
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	82.21m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	06/10/16	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
					0.10	82.11		Block paving. (MADE GROUND)
		0.20-0.50	B		0.20	82.01		Concrete. (MADE GROUND)
		0.40	ES					Grey very gravelly fine to coarse SAND. Gravel is angular and subangular fine to coarse of limestone concrete and granite. (MADE GROUND)
					0.50	81.71		Reddish brown very sandy GRAVEL of angular and subangular fine to coarse limestone and brick fragments. (MADE GROUND)
								.. below 0.80m, becoming slightly clayey.
					0.90	81.31		Firm reddish brown and light brown very gravelly slightly sandy CLAY. Gravel is angular to subrounded medium and coarse limestone and brick fragments. (MADE GROUND)
		1.00	ES		1.10	81.11		Stiff grey and orangeish brown locally slightly gravelly CLAY with occasional silt grade to medium sand grade gypsum crystals and occasional pockets (1mm to 2mm) of black clay and rare rootlets (<1mm by 30 to 50mm). Gravel is angular to subrounded fine to medium of limestone and mudstone. (WHITBY MUDSTONE FORMATION)
		1.20-1.65 1.20	D SPT	N=13 (2,2/3,3,3,4)				
		1.25	ES					
					1.85	80.36		*.. below 1.40m, rootlets and pockets become absent.*
		1.90-2.35 1.90	D SPT	N≥50 (25 for 40mm/50 for 45mm)	1.90	80.31		*.. below 1.70m, becoming very stiff.*
								Light grey sandy GRAVEL of angular to subrounded fine to coarse of limestone. (MARLSTONE FORMATION)
								End of Borehole at 1.90m

1.0 2.0 3.0 4.0 5.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
FID = Flame Ionization Detector (ppmv)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Groundwater: No groundwater encountered.

Logged: MOB **Checked:** RB

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Window Sampler

Borehole No. WSS007 Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472248E, 255082N	**Hole Type:** WS
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	83.21m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	06/10/16	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
					0.10	83.11		Block paving. (MADE GROUND)
					0.25	82.96		Concrete. (MADE GROUND)
		0.30	ES					Grey very gravelly fine to coarse SAND. Gravel is angular and subangular fine to coarse of limestone concrete and granite. (MADE GROUND)
					0.50	82.71		Reddish brown very sandy GRAVEL of angular and subangular fine to coarse limestone and brick fragments. (MADE GROUND)
					0.90	82.31		Firm reddish brown and light brown very gravelly slightly sandy CLAY. Gravel is angular to subrounded medium and coarse limestone and brick fragments. (MADE GROUND)
					1.10	82.11		
		1.25	ES					Stiff grey and orangeish brown locally slightly gravelly CLAY with occasional silt grade to medium sand grade gypsum crystals and rare rootlets (<1mm by 30 to 50mm). Gravel is angular to subrounded fine to medium of limestone and mudstone. (WHITBY MUDSTONE FORMATION)
		1.50-1.80	B					*.. below 1.70m, becoming very stiff.*
					2.00	81.21		Light grey sandy GRAVEL of angular to subrounded fine to coarse of limestone. (MARLSTONE FORMATION)
					2.10	81.11		End of Borehole at 2.10m

1.0 2.0 3.0 4.0 5.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Borehole backfilled with arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
FID = Flame Ionization Detector (ppmv)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Groundwater: No groundwater encountered.

Logged: MOB **Checked:** RB

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Window Sampler

Borehole No. WSS008 Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472248E, 255049N	**Hole Type:** WS
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	83.43m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	06/10/16	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
					0.10	83.33		Asphalt (MADE GROUND)
		0.20	ES		0.25	83.18		Grey very gravelly fine to coarse SAND. Gravel is angular and subangular fine to coarse of limestone concrete and granite. (MADE GROUND)
					0.40	83.03		Reddish brown very sandy GRAVEL of angular and subangular fine to coarse limestone and brick fragments. (MADE GROUND)
								Light grey very gravelly slightly clayey fine to coarse SAND. Gravel is angular to subrounded fine to coarse of limestone and brick fragments. (MADE GROUND)
					1.00	82.43		*.. below 0.70m, becoming clayey.*
		1.10	ES					Firm to stiff light brown gravelly slightly sandy CLAY. Gravel is subangular and subrounded fine to coarse of limestone and brick fragments. (MADE GROUND)
		1.20-1.65	D		1.20	82.23		Stiff to very stiff light grey and orangeish brown slightly CLAY. (WHITBY MUDSTONE FORMATION)
		1.20	SPT	N=26 (2,2/3,3,6,14)				*.. below 1.30m, occasional rootlets (<1mm by 10 to 30mm).*
		1.60-2.05	D		1.60	81.83		Light grey sandy GRAVEL of angular to subrounded fine to coarse of limestone. (WHITBY MUDSTONE FORMATION)
		1.60	SPT	N=24 (25 for 70mm/14,3,3,4)	1.80	81.63		Very stiff thinly laminated grey and orangeish brown locally slightly gravelly CLAY. Gravel is subangular and subrounded fine to coarse of limestone and mudstone. (WHITBY MUDSTONE FORMATION)
		2.00-2.45	D					
		2.00	SPT	N=16 (3,3/3,4,4,5)				
		2.10-2.60	B					
		2.85	SPT	N=25 (12,6/6,6,6,7)	2.85	80.58		End of Borehole at 2.85m

1.0 2.0 3.0 4.0 5.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
FID = Flame Ionization Detector (ppmv)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Groundwater: No groundwater encountered.

Logged: MOB **Checked:** RB

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Window Sampler

Borehole No. WSS009 Sheet 1 of 1

Project Name:	Rail Central		**Co-ords:**	472255E, 255079N	**Hole Type:** WS
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Ground Level:**	83.20m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	06/10/16	**Hole Diameter:** 110mm

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
					0.10	83.10		Block paving. (MADE GROUND)
								Concrete. (MADE GROUND)
					0.30	82.90		
		0.35	ES					Greyish red and light grey very sandy GRAVEL of angular and subangular fine to coarse brick fragments. (MADE GROUND)
					0.50	82.70		
								Red sandy GRAVEL of angular to subrounded fine to coarse brick fragments. (MADE GROUND)
								.. below 0.80m, becoming slightly clayey.
					0.90	82.30		Firm reddish brown very sandy gravelly CLAY. Gravel is angular and subangular fine to coarse of brick fragments and limestone. (MADE GROUND)
					1.20	82.00		
		1.25 1.30-1.70	ES B					Stiff to very stiff grey and orangeish brown locally slightly gravelly CLAY. Gravel is subangular and subrounded fine and medium of limestone and mudstone. (WHITBY MUDSTONE FORMATION)
								.. below 1.80m, becoming very stiff.
					2.00	81.20		End of Borehole at 2.00m

1.0 2.0 3.0 4.0 5.0

Remarks: 1. Excavate hand dug inspection pit to 1.20m. 2. Borehole backfilled with arisings.

B = Bulk Sample
D = Disturbed Sample
U = Undisturbed Sample
UT = Undisturbed Sample (Thin Wall)
ES = Environmental Sample
W = Water Sample
FID = Flame Ionization Detector (ppmv)
SPT = Standard Penetration Test
AB = Asbestos Bulk Sample

Groundwater: No groundwater encountered.

Logged: MOB **Checked:** RB

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Hand Dug Pit

Trial Pit No: HPS01
Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** HP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472229E, 254860N	**Scale:** 1:10
			Ground Level:	81.50m OD	
Client:	Ashfield Land		**Date(s):**	08/10/16	**Plant Used:** Spade

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.20	ES					Grass over firm greyish brown CLAY with some rootlets. (TOPSOIL)
				0.20	81.30		End of Trial Pit at 0.20m

1.0

2.0

Remarks: 1. Hand dug pit for surface sample.

Stability: Sides stable

Groundwater: Surface waterlogged

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: RB **Checked:** CV

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Hand Dug Pit

Trial Pit No: HPS02
Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** HP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472204E, 254819N	**Scale:** 1:10
			Ground Level:	82.35m OD	
Client:	Ashfield Land		**Date(s):**	08/10/16	**Plant Used:** Spade

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.20	ES					Grass over soft greyish brown CLAY with some rootlets. (TOPSOIL)
				0.20	82.15		End of Trial Pit at 0.20m

1.0

2.0

Remarks: 1. Hand dug pit for surface sample.

Stability: Sides stable

Groundwater: Surface waterlogged

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: RB **Checked:** CV

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Hand Dug Pit

Trial Pit No: HPS03
Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** HP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472180E, 254774N	**Scale:** 1:10
			Ground Level:	83.35m OD	
Client:	Ashfield Land		**Date(s):**	08/10/16	**Plant Used:** Spade

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.20	ES					Grass over soft greyish brown CLAY with some rootlets. (TOPSOIL)
				0.20	83.15		End of Trial Pit at 0.20m

1.0

2.0

Remarks: 1. Hand dug pit for surface sample.

Stability: Sides stable

Groundwater: Surface waterlogged

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: RB **Checked:** CV

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Hand Dug Pit

Trial Pit No: HPS04
Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** HP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472162E, 254693N	**Scale:** 1:10
			Ground Level:	86.00m OD	
Client:	Ashfield Land		**Date(s):**	08/10/16	**Plant Used:** Spade

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.20	ES					Grass over firm greyish brown CLAY with some rootlets. (TOPSOIL)
				0.20	85.80		End of Trial Pit at 0.20m

1.0

2.0

Remarks: 1. Hand dug pit for surface sample.

Stability: Sides stable

Groundwater: Surface waterlogged

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: RB **Checked:** CV

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Trial Pit

Trial Pit No: TPA001 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:** / **Ground Level:**	472625E, 254505N / 80.22m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	06/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
	0.10	D					Stiff dark brown sandy CLAY with rootlets. (TOPSOIL)
				0.30	79.92		Stiff brown sandy CLAY with rootlets. (ALLUVIUM)
	0.85	B					
	0.90	HSV	87	0.90	79.32		*.. 0.80-0.90m bgl: Becoming very sandy with occasionally gravel of fine to coarse subangular to subrounded ironstone and flint.*
	1.30	D					Stiff light grey and light brown CLAY. (WHITBY MUDSTONE FORMATION)
	2.00	HSV	107				
				2.40	77.82		Stiff bluish grey CLAY with relict rootlets and gypsum crystals. (WHITBY MUDSTONE FORMATION)
	3.00	B					
				3.10	77.12		End of Trial Pit at 3.10m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPA002

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:** **Ground Level:**	472591E, 254543N 80.38m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	06/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.25	ES		0.30	80.08		Stiff dark brown sandy CLAY with rootlets. (TOPSOIL)
	0.70	B					Firm brown very sandy slightly gravelly CLAY with a low cobble content. Gravel is fine to coarse angular to subrounded of flint and ironstone. Cobbles are subangular to subrounded ironstone. (ALLUVIUM)
							.. 0.80-1.00m bgl: Clay becomes soft.
	1.10	HSV	98	1.00	79.38		Stiff light grey mottled light brown CLAY. (WHITBY MUDSTONE FORMATION)
							.. 1.50m bgl: Clay is fissile and dark grey.
	1.70	B					
	2.00	HSV	104				
	2.90	D					*.. 2.80m bgl: Clay is thickly laminated, and composed of mudstone lithorelicts.*
				2.95	77.43		End of Trial Pit at 2.95m

1.0 2.0 3.0 4.0 5.0

Remarks:	Trial Pit backfilled with arisings on completion
Stability:	Stable
Groundwater:	No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPA003

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472586E, 254588N	**Scale:** 1:25
			Ground Level:	80.16m OD	
Client:	Ashfield Land		**Date(s):**	06/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30	ES		0.33	79.83		Stiff dark brown slightly sandy slightly gravelly CLAY with rootlets. Gravel is fine to coarse angular to subrounded of flint. (TOPSOIL)
	0.60	D					Firm brown very sandy slightly gravelly CLAY with a low cobble content and rootlets. Gravel and cobbles are fine to coarse angular to subrounded of flint and ironstone. (ALLUVIUM)
	1.20	B		0.90	79.26		Stiff light grey mottled light brown CLAY. (WHITBY MUDSTONE FORMATION)
	1.20	HSV	94				
	1.80	HSV	117				
	2.20	HSV	95				*.. 2.20-2.80m bgl: Becoming bluish grey with relict rootlets and gypsum crystals.*
	2.70	B					
▼				2.80	77.36		Light brown LIMESTONE recovered as a sandy fine to coarse GRAVEL with a high cobble content. (MARLSTONE FORMATION)
				2.85	77.31		End of Trial Pit at 2.85m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: Groundwater seepage at 2.85m bgl

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPA004

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472541E, 254717N	**Scale:** 1:25
			Ground Level:	79.09m OD	
Client:	Ashfield Land		**Date(s):**	05/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30 - 0.60	ES		0.30	78.79		Firm greyish brown slightly sandy slighty gravelly CLAY with occasional rootlets. Gravel is rounded and subangular to rounded fine to coarse quartzite. (TOPSOIL)
	0.60 - 0.90	B		0.60	78.49		Orangeish brown slightly gravelly fine to coarse grained SAND with occasional rootlets. Gravel is subangular to rounded fine to coarse quartz and flint. (ALLUVIUM)
				0.90	78.19		orange brown slightly sandy subangular to rounded fine to coarse GRAVEL of quartz and flint with occasional cobbles of quartz. (ALLUVIUM)
	1.70	HSV	130				Stiff closley fissured grey and yellowish brown CLAY. (WHITBY MUDSTONE FORMATION)
	2.30	HSV	113	1.80	77.29		Stiff grey CLAY with occasional relict rootlets and rare sand grade gypsum crystals. (WHITBY MUDSTONE FORMATION)
				2.70	76.39		Stiff very thinly bedded grey CLAY with occasional mudstone lithorelicts, sand grade gypsum crystals and relict rootlets. (WHITBY MUDSTONE FORMATION)
				2.90	76.19		End of Trial Pit at 2.90m

1.0 2.0 3.0 4.0 5.0

Remarks: Pit walls remained stable, Ground water not encountered.

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: RB **Checked:** CV

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Trial Pit

Trial Pit No: TPA005 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:** **Ground Level:**	472613E, 254693N 78.93m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	05/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES		0.30	78.63		Stiff dark brown sandy CLAY with rootlets. (TOPSOIL)
	0.50	HSV	104				Stiff greyish brown and brown slightly sandy CLAY with rootlets. (ALLUVIUM)
	0.75	B		0.70	78.23		Firm brown sandy gravelly CLAY. Gravel is fine to coarse angular to subrounded of flint and ironstone. (ALLUVIUM)
	1.00	D		0.85	78.08		Stiff grey slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded of flint and mudstone. (WHITBY MUDSTONE FORMATION)
	1.00	HSV	95				
							.. 1.70m bgl: Becoming firm bluish grey with relict rootlets and gypsum crystals.
	2.40	B					
	2.40	HSV	91				
				3.05	75.88		End of Trial Pit at 3.05m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPA006

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472689E, 254668N	**Scale:** 1:25
			Ground Level:	79.08m OD	
Client:	Ashfield Land		**Date(s):**	05/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.15	ES					Stiff dark brown CLAY with rootlets. (TOPSOIL)
				0.27	78.81		
	0.50	D					Stiff brown sandy gravelly CLAY with rootlets. Gravel is fine to coarse angular to subangular of ironstone and flint. (ALLUVIUM)
	0.50	HSV	84				
							.. 0.70-0.90m bgl: Cobbles of ironstone.
				0.90	78.18		
	1.10	B					Stiff light grey mottled light greyish brown slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of ironstone. (WHITBY MUDSTONE FORMATION)
	1.10	HSV	75				
							.. 1.90-2.80m bgl: Becoming bluish grey.
	2.40	HSV	98				
							.. 2.80-3.10m bgl: laminated and contains gypsum crystals.
	2.90	B					
				3.10	75.98		End of Trial Pit at 3.10m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPA007 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472567E, 254858N	**Scale:** 1:25
			Ground Level:	78.10m OD	
Client:	Ashfield Land		**Date(s):**	22/08/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.30	77.80		MADE GROUND: Greyish brown slightly sandy slightly gravelly CLAY with occasional rootlets. Gravel is angular fine and medium brick fragments and quartz. (MADE GROUND)
							MADE GROUND: Firm yellowish brown slightly sandy slightly gravelly CLAY with occasional rootlets. Gravel is subangular to rounded fine and medium of quartz and ash. (MADE GROUND)
				1.20	76.90		Soft brownish grey sandy gravelly CLAY. Gravel is angular to rounded fine to coarse quartzite. (ALLUVIUM)
	1.40 - 1.70	B		1.40	76.70		Brown and grey clayey sandy GRAVEL with occasional flint cobbles. Gravel is angular to rounded fine to coarse of quartz and flint. (ALLUVIUM)
				1.80	76.30		Stiff grey locally yellowish brown CLAY with occasional relict rootlets. (WHITBY MUDSTONE FORMATION)
				2.40	75.70		End of Trial Pit at 2.40m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Walls of pit collapsed between 0.0m and 1.8m.

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: RB **Checked:** CV

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Trial Pit

Trial Pit No: TPA008

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472662E, 254822N	**Scale:** 1:25
			Ground Level:	78.12m OD	
Client:	Ashfield Land		**Date(s):**	23/08/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.35	ES					Stiff greyish brown slightly sandy CLAY with occasional rootlets. (TOPSOIL)
	0.35 - 0.80	B		0.35	77.77		Stiff yellowish brown and grey slightly sandy slightly gravelly CLAY with occasional rootlets. Gravel is subrounded and rounded fine and medium quartz and flint. (ALLUVIUM)
				1.20	76.92		Stiff grey locally yellowish brown CLAY. (WHITBY MUDSTONE FORMATION)
							.. At 1.4m bgl: Polished surface encountered.
	1.70 - 1.90	B					*.. At 1.7m bgl: Becoming Soft locally firm with frequent sand grade gypsum crystals.*
				2.20	75.92		Very stiff grey mottled light grey CLAY with occasional sand grade gypsum crystals and relict rootlets. (WHITBY MUDSTONE FORMATION)
				2.50	75.62		Extremely weak grey brown fine and medium grained SANDSTONE. (WHITBY MUDSTONE FORMATION)
				2.70	75.42		End of Trial Pit at 2.70m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: RB **Checked:** CV

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Trial Pit

Trial Pit No: TPA010 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472797E, 254769N	**Scale:** 1:25
			Ground Level:	78.28m OD	
Client:	Ashfield Land		**Date(s):**	23/08/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
							Firm greyish brown CLAY with occasional rootlets. (TOPSOIL)
				0.30	77.98		Stiff brownish grey CLAY with occasional rootlets. (ALLUVIUM)
	0.70 - 1.00	B		0.70	77.58		Grey and orange-brown slightly silty fine to coarse grained SAND. (ALLUVIUM)
	1.50 - 1.90	B		1.50	76.78		Brown and grey clayey sandy GRAVEL. Gravel is angular to rounded fine to coarse of quartz and flint. (ALLUVIUM)
				1.90	76.38		Stiff grey locally yellowish grey CLAY. (WHITBY MUDSTONE FORMATION)
				2.60	75.68		Stiff very thinly bedded grey CLAY. (WHITBY MUDSTONE FORMATION)
				3.20	75.08		End of Trial Pit at 3.20m

1.0 2.0 3.0 4.0 5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater encountered between 1.5m and 1.9m.

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: RB **Checked:** CV

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Trial Pit

Trial Pit No: TPA011

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472844E, 254753N	**Scale:** 1:25
			Ground Level:	78.39m OD	
Client:	Ashfield Land		**Date(s):**	23/08/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.35	ES					Stiff greyish brown slightly sandy CLAY with some rootlets. (TOPSOIL)
				0.35	78.04		Stiff closely and very closely fissured brown grey slightly sandy slightly gravelly CLAY with occasional rootlets. Gravel is rounded to subangular fine to medium sized quartz. (ALLUVIUM)
	1.10	HSV	82				
	1.30 - 1.50	B		1.30	77.09		Soft grey and orange-brown slightly sandy gravelly CLAY. Gravel is rounded to subangular fine to medium quartz, flint and occasional mudstone. (ALLUVIUM)
	1.50	HSV	49				
	1.60 - 2.00	B		1.60	76.79		Stiff grey sandy gravelly CLAY. Gravel is subrounded and rounded fine to medium occasionally coarse sized chalk, quartz and flint. (GLACIAL TILL)
	2.00 - 2.70	B		2.00	76.39		Stiff grey CLAY with many mudstone lithorelicts and occasional relict rootlets. (WHITBY MUDSTONE FORMATION)
				2.70	75.69		End of Trial Pit at 2.70m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: RB **Checked:** CV

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Trial Pit

Trial Pit No: TPA012

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472898E, 254731N	**Scale:** 1:25
			Ground Level:	79.59m OD	
Client:	Ashfield Land		**Date(s):**	23/08/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
							Stiff greyish brown slightly sandy slightly gravelly clay with occasional rootlets. Gravel is subrounded fine and medium quartz. (TOPSOIL)
				0.30	79.29		Stiff brownish grey slightly sandy slightly gravelly CLAY with occasional rootlets. Gravel is subrounded and rounded fine and medium quartz. (ALLUVIUM)
				0.90	78.69		Stiff closely and very closely fissured grey and yellow grey CLAY with occasional rootlets. (WHITBY MUDSTONE FORMATION)
	1.30 - 1.50	B		1.30	78.29		Stiff very thinly bedded grey locally orange brown CLAY. (WHITBY MUDSTONE FORMATION)
	1.80 - 2.30	B		1.80	77.79		Stiff very thinly interbedded grey and orange brown CLAY with occasional subangular and subrounded fragments of mudstone and ferruginous siltstone and sand sized gypsum crystals along bedding planes. (WHITBY MUDSTONE FORMATION)
				3.20	76.39		End of Trial Pit at 3.20m

1.0 2.0 3.0 4.0 5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: RB **Checked:** CV

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Trial Pit

Trial Pit No: TPA015

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472868E, 255026N	**Scale:** 1:25
			Ground Level:	77.00m OD	
Client:	Ashfield Land		**Date(s):**	14/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES		0.25	76.75		Stiff dark brown slightly sandy CLAY with rootlets. (TOPSOIL)
	0.60	HSV	50				Stiff brown CLAY with rootlets. (ALLUVIUM)
							.. 0.60m bgl: Becoming firm.
	1.00	HSV	35				*.. 1.00m bgl: Becoming soft.*
				1.75	75.25		Very soft greenish grey CLAY with relict rootlets. (ALLUVIUM)
	2.00	B					
	2.00	HSV	6				
▼	2.40	D		2.30	74.70		Soft dark brownish dark greenish grey sandy gravelly organic CLAY. Gravel is fine to coarse angular to subrounded of wood, mussel shells and flint. (ALLUVIUM)
				2.50	74.50		Firm light grey slightly silty CLAY with muscovite mica and relict rootlets. (DYRHAM FORMATION)
	3.60	B					
				3.70	73.30		End of Trial Pit at 3.70m

1.0 2.0 3.0 4.0 5.0

Remarks:	Trial Pit backfilled with arisings on completion
Stability:	Stable
Groundwater:	Slight groundwater seepage at 2.30m bgl

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPA016

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472936E, 255028N	**Scale:** 1:25
			Ground Level:	78.06m OD	
Client:	Ashfield Land		**Date(s):**	15/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES		0.25	77.81		Stiff dark brown very sandy CLAY with rootlets. (TOPSOIL)
							Stiff brown slightly sandy CLAY. (WHITBY MUDSTONE FORMATION)
							.. 0.70m bgl: Becoming greyish brown.
							.. 1.00-1.10m bgl: Pocket of light brown sandy CLAY.
				1.60	76.46		Yellowish brown clayey sandy GRAVEL and cobble sized fragments of mudstone. (MARLSTONE FORMATION)
	1.80	B					
				2.00	76.06		Stiff brown mottled grey sandy CLAY. (DYRHAM FORMATION)
	2.20	B					
	2.20	HSV	87				
				2.60	75.46		Stiff thickly laminated sandy CLAY composed of mudstone lithorelicts. (DYRHAM FORMATION)
				2.80	75.26		End of Trial Pit at 2.80m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPA018

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472849E, 255172N	**Scale:** 1:25
			Ground Level:	77.29m OD	
Client:	Ashfield Land		**Date(s):**	14/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.10	ES		0.10	77.19		Stiff dark brown sandy CLAY with rootlets. (TOPSOIL)
							Stiff brown sandy CLAY (ALLUVIUM)
				0.60	76.69		Stiff greyish brown CLAY (DYRHAM FORMATION)
	1.40	B					
	1.40	HSV	87				
	1.60	HSV	107				
							.. 1.80m bgl: Becoming dark grey with mudstone lithorelicts.
							.. 2.30m bgl: Relict rootlets and gypsum present.
	2.80	B					
				2.95	74.34		End of Trial Pit at 2.95m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPA019

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.60m x 1.75m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472883E, 255159N	**Scale:** 1:25
			Ground Level:	78.50m OD	
Client:	Ashfield Land		**Date(s):**	15/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.15	ES		0.25	78.25		Firm very sandy dark brown CLAY with rootlets. (TOPSOIL)
							Stiff light brown CLAY. (WHITBY MUDSTONE FORMATION)
							.. 0.50-0.90m bgl: Becoming stiff greyish brown CLAY.
				0.90	77.60		Firm grey and greyish brown slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of mudstone. (WHITBY MUDSTONE FORMATION)
	1.30	B					
				1.50	77.00		Stiff dark grey CLAY. (WHITBY MUDSTONE FORMATION)
							.. 2.40-2.80m bgl: Becoming thickly laminated with gypsum and relict rootlets.
				2.80	75.70		End of Trial Pit at 2.80m

1.0
2.0
3.0
4.0
5.0

Remarks: Infiltration test carried out in pit. Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPA022 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472885E, 255297N	**Scale:** 1:25
			Ground Level:	78.64m OD	
Client:	Ashfield Land		**Date(s):**	14/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.15	ES					Dark brown clayey fine to medium SAND with rootlets. (TOPSOIL)
				0.30	78.34		
							Brown very clayey fine to coarse SAND. (GLACIOFLUVIAL DEPOSITS)
				0.75	77.89		
	0.90	B					Firm brown and light grey sandy CLAY. (GLACIOFLUVIAL DEPOSITS)
	0.90	HSV	67				
							.. 1.20m bgl: Becoming stiff predominantly grey no sand.
	1.50	HSV	108				
				2.85	75.79		
	3.00	B					Stiff thickly laminated dark grey slightly gravelly CLAY. Gravel is fine to coarse angular to subangular of mudstone. (WHITBY MUDSTONE FORMATION)
	3.00	HSV	110				
				3.20	75.44		End of Trial Pit at 3.20m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPA023

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.60m x 1.85m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472948E, 255271N	**Scale:** 1:25
			Ground Level:	82.13m OD	
Client:	Ashfield Land		**Date(s):**	15/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.10	ES		0.20	81.93		Dark brown clayey slightly gravelly fine to coarse SAND. Gravel is fine to coarse angular to subrounded of ceramics, brick and mudstone. (MADE GROUND)
							Brown clayey fine to medium SAND. (GLACIOFLUVIAL DEPOSITS)
				1.20	80.93		
	1.50	B					Stiff orange brown mottled light grey sandy CLAY with thin lenses of fine to coarse subangular to subrounded SAND and GRAVEL of fine to coarse subangular to subrounded mudstone and ironstone. (GLACIOFLUVIAL DEPOSITS)
	1.50	HSV	99				
				1.70	80.43		End of Trial Pit at 1.70m

1.0
2.0
3.0
4.0
5.0

Remarks: Infiltration test carried out in pit. Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPA024

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472847E, 255476N	**Scale:** 1:25
			Ground Level:	74.92m OD	
Client:	Ashfield Land		**Date(s):**	07/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30	ES		0.35	74.57		Firm dark brown sandy CLAY with rootlets. (TOPSOIL)
	0.60	B					Light brown very clayey fine to medium SAND with a low cobble content. Cobbles are angular to subrounded of limestone. (MARLSTONE FORMATION)
	1.20	HSV	56	1.10	73.82		Firm becoming soft brown light greyish brown very sandy CLAY. (DYRHAM FORMATION)
	2.00	D					*.. becoming soft below 2.00m.*
	2.00	HSV	23				
	3.10	B		2.70	72.22		Firm becoming stiff bluish dark grey CLAY with abundant mica. (DYRHAM FORMATION)
	3.10	HSV	77	3.20	71.72		End of Trial Pit at 3.20m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPA025 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472881E, 255468N	**Scale:** 1:25
			Ground Level:	74.11m OD	
Client:	Ashfield Land		**Date(s):**	07/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.10	ES					Firm dark brown sandy CLAY with rootlets. (MADE GROUND)
				0.25	73.86		Soft to stiff greyish brown slightly sandy CLAY with occasional fine to coarse angular to subangular gravel of ash and rare brick fragments. (MADE GROUND)
							.. 0.60m bgl: Land drain.
	0.80	B					*.. 0.60-1.20m bgl: Becoming sandy and mottled orangish brown.*
	0.80	HSV	53				
	1.10	HSV	25				*.. 1.00m bgl: Plastic land drain. Hole extended 0.50m to the side.*
				1.20	72.91		(Uncompact) greyish dark brown organic SILT. (ALLUVIUM)
	1.40	D					
▼	1.40	HSV	16				
				1.60	72.51		Greenish dark grey fossiliferous LIMESTONE recovered as a sandy fine to coarse angular GRAVEL with a high cobble content. (MARLSTONE FORMATION)
				2.00	72.11		Stiff grey slightly gravelly CLAY. Gravel is fine to coarse subrounded to rounded of fossiliferous limestone. (MARLSTONE FORMATION)
	2.60	B					
	2.60	HSV	112				
							.. 2.95m bgl: Band of fossiliferous limestone cobbles.
				3.10	71.01		End of Trial Pit at 3.10m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: Slight groundwater seepage at 1.60m bgl

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPA026

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472928E, 255443N	**Scale:** 1:25
			Ground Level:	76.01m OD	
Client:	Ashfield Land		**Date(s):**	14/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.15	ES					Dark brown clayey fine to medium SAND with rootlets. (TOPSOIL)
				0.27	75.74		Brown clayey fine to medium SAND with a boulder of limestone/ concrete. (MADE GROUND)
				0.80	75.21		Stiff light greyish brown CLAY, with thin bands of sandy clay. (WHITBY MUDSTONE FORMATION)
	1.60	HSV	95				
							.. 1.80m bgl: becoming sandy and gravelly.
	2.00	B					
				2.20	73.81		Dark grey MUDSTONE over a weak weathered thinly bedded MUDSTONE recovered as angular fine to coarse GRAVEL with a medium cobble content. (WHITBY MUDSTONE FORMATION)
▼	2.60	B					
				3.00	73.01		Grey, brown and reddish brown fossiliferous LIMESTONE recovered as angular fine to coarse GRAVEL with a medium cobble and boulder content. (MARLSTONE FORMATION)
				3.40	72.61		End of Trial Pit at 3.40m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: Moderate groundwater seepage at 2.80m bgl

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPA027

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.60m x 1.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473004E, 255411N	**Scale:** 1:25
			Ground Level:	79.51m OD	
Client:	Ashfield Land		**Date(s):**	15/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES		0.30	79.21		Dark brown clayey fine to medium SAND with rootlets and rare brick. (TOPSOIL)
							Brown very clayey fine to medium SAND. (GLACIOFLUVIAL DEPOSITS)
							.. 0.80m bgl: Becoming a light brown fine to medium SAND.
	1.50	B					
							.. 1.80m bgl: Becoming slightly clayey with light grey pockets.
				2.00	77.51		End of Trial Pit at 2.00m

1.0
2.0
3.0
4.0
5.0

Remarks: Infiltration test carried out in pit. Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPA028 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472913E, 255541N	**Scale:** 1:25
			Ground Level:	74.15m OD	
Client:	Ashfield Land		**Date(s):**	07/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES		0.30	73.85		Dark brown very clayey fine SAND with rootlets. (TOPSOIL)
	0.80	D		0.95	73.20		Soft light brown mottled orange brown very sandy CLAY with occasional rare gravel of flint and ash. (MADE GROUND) *.. 0.65m bgl: Land drain.*
	1.30	B		1.70	72.45		Greyish brown and light brown gravelly fine to coarse SAND. Gravel is fine to coarse angular to rounded of flint and chalk. (ALLUVIUM)
▼	1.80	B					
▼	1.80	HSV	35	1.90	72.25		Soft greenish grey and bluish grey CLAY. (ALLUVIUM)
	2.20	HSV	56	2.20	71.95		Yellow-grey LIMESTONE recovered as angular gravel of limestone with a high cobble content. (MARLSTONE FORMATION)
	2.60	D		3.00	71.15		Firm grey slightly gravelly CLAY. Gravel is fine to medium subrounded to rounded of shell fragments and cementstone nodules. (DYRHAM FORMATION)
							End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: High groundwater inflow at 1.90m bgl

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPA029

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472961E, 255511N	**Scale:** 1:25
			Ground Level:	74.27m OD	
Client:	Ashfield Land		**Date(s):**	14/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES		0.30	73.97		Dark brown clayey fine to coarse SAND with rootlets and rare brick fragments. (MADE GROUND)
	0.50	HSV	48	0.70	73.57		Firm brown and orange brown sandy CLAY. (ALLUVIUM)
	0.80	D					
	0.80	HSV	25	1.25	73.02		Soft light brown mottled light grey CLAY. (ALLUVIUM)
▼	1.40	D		1.50	72.77		Soft greenish grey gravelly sandy organic CLAY. Gravel is fine to coarse subangular to rounded of sandstone and mudstone. (ALLUVIUM)
	2.00	B					Weak weathered grey LIMESTONE recovered as angular fine to coarse gravel with a medium cobble content. (MARLSTONE FORMATION)
	2.75	B		2.30	71.97		Firm grey sandy fossiliferous CLAY with occasional angular medium to coarse mudstone fragments. (DYRHAM FORMATION)
				3.20	71.07		End of Trial Pit at 3.20m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: Moderate/high groundwater flow at 1.50m bgl

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPA032

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.60m x 2.10m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472948E, 254952N	**Scale:** 1:25
			Ground Level:	77.55m OD	
Client:	Ashfield Land		**Date(s):**	15/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.10	ES					Stiff dark brown very sandy CLAY. (TOPSOIL)
				0.25	77.30		Firm brown slightly sandy CLAY. (WHITBY MUDSTONE FORMATION)
							.. 0.50-1.30m bgl: No sand becoming greyish brown.
▼	1.30	B		1.30	76.25		Firm light brownish grey mottled brown slightly sandy CLAY. (WHITBY MUDSTONE FORMATION)
				1.45	76.10		Weak weathered grey LIMESTONE recovered as clayey, sandy fine to coarse angular gravel with a medium cobble content. (MARLSTONE FORMATION)
				1.70	75.85		Stiff bluish grey fossiliferous CLAY. (DYRHAM FORMATION)
				2.00	75.55		End of Trial Pit at 2.00m

1.0 2.0 3.0 4.0 5.0

Remarks: Infiltration test carried out in pit. Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: Slight groundwater seepage at 1.45m bgl.

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPA033

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472965E, 254991N	**Scale:** 1:25
			Ground Level:	78.02m OD	
Client:	Ashfield Land		**Date(s):**	15/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.10	ES					Stiff dark brown slightly gravelly slightly sandy CLAY. Gravel is fine to coarse subangular to rounded of flint. (TOPSOIL)
				0.25	77.77		Stiff brown slightly sandy CLAY. (GLACIAL TILL)
							.. 0.50m bgl: Becoming gravelly. Gravel is fine to coarse angular to subrounded of chalk, flint and limestone.
				1.10	76.92		Brown and greyish brown LIMESTONE recovered as sandy angular fine to coarse gravel of limestone with a medium cobble content. (WHITBY MUDSTONE FORMATION)
				1.30	76.72		Stiff grey mottled brownish grey CLAY. (WHITBY MUDSTONE FORMATION)
	1.60	HSV	93				
							.. 2.00m bgl: Becoming bluish grey with relict rootlets.
	2.20	HSV	87				
				2.30	75.72		Weak weathered brown grey and orange brown thinly laminated LIMESTONE with fossils present. (MARLSTONE FORMATION)
				2.60	75.42		Stiff grey CLAY. (DYRHAM FORMATION)
	2.80	HSV	110				
							.. 3.00m bgl: Thickly laminated mudstone lithorelicts recovered as a clayey fine to coarse angular GRAVEL.
	3.20	B					
▼				3.40	74.62		End of Trial Pit at 3.40m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: Slight groundwater seepage at base

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPA034

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473110E, 254608N	**Scale:** 1:25
			Ground Level:	80.48m OD	
Client:	Ashfield Land		**Date(s):**	08/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30	ES		0.30	80.18		Firm dark brown silty CLAY with abundant rootlets. (TOPSOIL)
	0.80	B		0.80	79.68		Firm orangeish brown mottled light grey silty CLAY. (WHITBY MUDSTONE FORMATION)
	1.00	HSV	128				Stiff brown mottled bluish grey silty CLAY with some angular to subangular fine to coarse gravel sized mudstone fragments. (WHITBY MUDSTONE FORMATION)
	2.30	B		2.30	78.18		Stiff closely fissured greenish grey mottled bluish grey silty CLAY. (WHITBY MUDSTONE FORMATION)
				3.00	77.48		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Sides stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Trial Pit

Trial Pit No: TPA035

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473158E, 254616N	**Scale:** 1:25
			Ground Level:	80.41m OD	
Client:	Ashfield Land		**Date(s):**	08/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.35	ES		0.35	80.06		Firm brown silty CLAY with frequent rootlets. (TOPSOIL)
	0.90 0.90	B HSV	97				Firm brown mottled light grey silty slightly sandy CLAY. (WHITBY MUDSTONE FORMATION)
	1.20 1.20	B HSV	113	1.20	79.21		Stiff orange brown mottled bluish grey silty CLAY with frequent angular to subangular fine to coarse fragments of weathered mudstone. (WHITBY MUDSTONE FORMATION)
				3.00	77.41		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Sides stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Trial Pit

Trial Pit No: TPA036 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473181E, 254624N	**Scale:** 1:25
			Ground Level:	80.50m OD	
Client:	Ashfield Land		**Date(s):**	08/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.10	ES		0.20	80.30		Stiff dark brown CLAY with rootlets. (TOPSOIL)
							Stiff light brown mottled greyish brown CLAY. (WHITBY MUDSTONE FORMATION)
	1.00 1.00	D HSV	74	0.80	79.70		Firm grey mottled light brown CLAY with occasional gravel of fine to coarse angular to subrounded of flint. (WHITBY MUDSTONE FORMATION)
	2.00 2.00	B HSV	118	1.75	78.75		Stiff dark grey CLAY with occasionally light brown reduction spots. (WHITBY MUDSTONE FORMATION)
				2.40	78.10		Stiff thickly laminated dark grey CLAY with mudstone lithorelicts, rootlets and occasional gypsum crystals. (WHITBY MUDSTONE FORMATION)
				3.10	77.40		End of Trial Pit at 3.10m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPA037 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:** **Ground Level:**	473219E, 254638N 80.96m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	08/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES		0.25	80.71		Stiff dark brown CLAY with rootlets. (TOPSOIL)
				0.65	80.31		Stiff yellowish brown mottled light grey CLAY. (WHITBY MUDSTONE FORMATION)
	0.80	HSV	104				Stiff grey mottled light brown slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded of flint, mudstone and ironstone. (WHITBY MUDSTONE FORMATION)
	1.70	HSV	110				*.. 1.50-2.20m bgl: Clay is laminated with gypsum crystals.*
				2.20	78.76		Stiff bluish grey very weak MUDSTONE recovered as a clayey angular fine to coarse gravel. (WHITBY MUDSTONE FORMATION)
	2.60	B					
				3.00	77.96		End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPA038

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473195E, 254386N	**Scale:** 1:25
			Ground Level:	82.70m OD	
Client:	Ashfield Land		**Date(s):**	28/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES					Firm brown locally orange brown locally slightly sandy CLAY with frequent rootlets. (TOPSOIL)
				0.35	82.35		
				0.70	82.00		Firm to stiff orangeish brown and grey slightly gravelly CLAY with occasional silt grade gypsum crystals and rootlets. Gravel is subangular and subrounded fine to coarse ferruginous siltstone and limestone. (WHITBY MUDSTONE FORMATION)
	2.00	HSV	97				Stiff bluish grey locally orange brown and bluish grey slightly gravelly CLAY with frequent silt grade gypsum crystals. Gravel is subangular and subrounded fine to coarse mudstone and ferruginous siltstone. (WHITBY MUDSTONE FORMATION)
				2.80	79.90		End of Trial Pit at 2.80m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: MOB **Checked:** RB

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Trial Pit

Trial Pit No: TPA039 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.65m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473229E, 254392N	**Scale:** 1:25
			Ground Level:	82.35m OD	
Client:	Ashfield Land		**Date(s):**	28/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES					Firm brown slightly sandy CLAY with occasional rootlets. (TOPSOIL)
				0.40	81.95		
	0.50	B					Firm to stiff orangeish brown and grey slightly gravelly CLAY with occasional silt grade gypsum crystals and rootlets. Gravel is subangular and subrounded fine to coarse ferrouginous siltstone and limestone. (WHITBY MUDSTONE FORMATION)
				0.70	81.65		
	1.00	HSV	103				Stiff bluish grey locally orange brown and bluish grey slightly gravelly CLAY with frequent silt grade gypsum crystals. Gravel is subangular and subrounded fine to coarse mudstone and ferrouginous siltstone. (WHITBY MUDSTONE FORMATION)
				2.60	79.75		End of Trial Pit at 2.60m

1.0 2.0 3.0 4.0 5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: MOB **Checked:** RB

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Trial Pit

Trial Pit No: TPA040 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473256E, 254388N	**Scale:** 1:25
			Ground Level:	82.91m OD	
Client:	Ashfield Land		**Date(s):**	08/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.15	ES		0.25	82.66		Stiff dark brown CLAY with rootlets. (TOPSOIL)
	0.70	D					Stiff becoming firm light brown mottled brownish grey CLAY. (WHITBY MUDSTONE FORMATION)
	0.70	HSV	69	0.80	82.11		*.. 0.50-0.80m bgl: Becoming firm.*
	1.00	HSV	94				Stiff grey mottled light brown slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of mudstone. (WHITBY MUDSTONE FORMATION)
	1.90	B					*.. 2.00-2.60m bgl: contains relict rootlets, gypsum crystals and rare wood.*
	2.50	B					
	2.50	HSV	62				*.. 2.60m bgl: Becoming gravelly. Gravel is fine to coarse angular to subangular very weak mudstone. No relict rootlets, wood or gypsum crystals present.*
				3.05	79.86		End of Trial Pit at 3.05m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPA041 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:** **Ground Level:**	473292E, 254395N 83.63m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	08/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.10	ES		0.20	83.43		Stiff dark brown slightly sandy slightly gravelly CLAY with rootlets. Gravel is fine to medium subangular to subrounded of flint and shell fragments. (TOPSOIL)
	0.60	B					Stiff light brown CLAY. (WHITBY MUDSTONE FORMATION)
	0.90	HSV	100	0.80	82.83		Stiff grey mottled brown CLAY. (WHITBY MUDSTONE FORMATION)
	1.80 1.80	D HSV	114	1.60	82.03		Stiff dark grey gravelly CLAY. Gravel is fine to coarse angular to subangular very weak weathered mudstone. (WHITBY MUDSTONE FORMATION) *.. 2.00-3.00m bgl: Becoming very gravelly.*
	2.50	B					
				3.00	80.63		End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPA042

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.65m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473265E, 254264N	**Scale:** 1:25
			Ground Level:	84.25m OD	
Client:	Ashfield Land		**Date(s):**	28/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30	ES		0.35	83.90		Firm brown locally orange brown locally slightly sandy CLAY with frequent rootlets. (TOPSOIL)
				0.75	83.50		Firm to stiff orangeish brown and grey slightly gravelly CLAY with occasional silt grade gypsum crystals and rootlets. Gravel is subangular and subrounded fine to coarse ferrouginous siltstone and limestone. (WHITBY MUDSTONE FORMATION)
	2.00	HSV	115				Stiff bluish grey locally orange brown and bluish grey slightly gravelly CLAY with frequent silt grade gypsum crystals. Gravel is subangular and subrounded fine to coarse mudstone and ferrouginous siltstone. (WHITBY MUDSTONE FORMATION)
				2.60	81.65		*.. At 2.5-2.6m bgl: Frequent relict roots (0.5 to 2mm diam).*
							End of Trial Pit at 2.60m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: MOB **Checked:** RB

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Trial Pit

Trial Pit No: TPA043

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473268E, 254219N	**Scale:** 1:25
			Ground Level:	85.25m OD	
Client:	Ashfield Land		**Date(s):**	28/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES					Firm brown locally orange brown locally slightly sandy silty clay with frequent rootlets. (TOPSOIL)
				0.35	84.90		
							Firm to stiff orangeish brown and grey slightly gravelly CLAY with occasional silt grade gypsum crystals and rootlets. Gravel is subangular and subrounded fine to coarse ferruginous siltstone and limestone. (WHITBY MUDSTONE FORMATION)
				0.75	84.50		
							Stiff bluish grey locally orange brown and bluish grey slightly gravelly CLAY with frequent silt grade gypsum crystals. Gravel is subangular and subrounded fine to coarse mudstone and ferruginous siltstone. (WHITBY MUDSTONE FORMATION)
							.. At 2.1-2.3m bgl: Frequent relict roots (0.5 to 2mm diam).
	2.50 - 2.60	B					
				2.80	82.45		End of Trial Pit at 2.80m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: MOB **Checked:** RB

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Trial Pit

Trial Pit No: TPA044

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473292E, 254277N	**Scale:** 1:25
			Ground Level:	84.30m OD	
Client:	Ashfield Land		**Date(s):**	08/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.15	ES		0.25	84.05		Stiff dark brown CLAY with rootlets. (TOPSOIL)
	0.30	HSV	121				Stiff greyish brown mottled brown CLAY with rootlets. (WHITBY MUDSTONE FORMATION)
							.. 0.40-1.00m bgl: Becoming slightly sandy.
	0.70	D					
	0.70	HSV	91				
				1.00	83.30		Firm grey mottled light brown CLAY. (WHITBY MUDSTONE FORMATION)
	1.50	B					
	1.50	HSV	72				
							.. 2.00-2.70m bgl: with relict rootlets.
							.. 2.70-3.05m bgl: Becoming stiff laminated and containing mudstone lithorelicts.
	2.85	B					
	2.85	HSV	107				
				3.05	81.25		End of Trial Pit at 3.05m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPA045

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.55m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473438E, 254120N	**Scale:** 1:25
			Ground Level:	88.75m OD	
Client:	Ashfield Land		**Date(s):**	29/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES					Firm brown locally slightly sandy CLAY with frequent rootlets. (TOPSOIL)
				0.50	88.25		
	0.60 - 0.70	B					Stiff orangeish brown and grey slightly gravelly CLAY with occasional silt grade gypsum crystals and occasional rootlets. Gravel is subangular and subrounded fine to coarse of ferrouginous siltstone. (WHITBY MUDSTONE FORMATION)
				1.00	87.75		
	1.20	HSV	120				Stiff bluish grey locally orange brown and bluish grey slightly gravelly CLAY with frequent silt grade gypsum crystals. Gravel is subangular and subrounded fine to coarse mudstone and ferruginous siltstone. (WHITBY MUDSTONE FORMATION)
							.. At 1.5-1.75m bgl: Occasional relict roots (0.5 to 2mm diam).
				2.50	86.25		End of Trial Pit at 2.50m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: MOB **Checked:** RB

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Trial Pit

Trial Pit No: TPA046

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473486E, 254102N	**Scale:** 1:25
			Ground Level:	89.75m OD	
Client:	Ashfield Land		**Date(s):**	29/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES					Firm brown locally slightly sandy CLAY with frequent rootlets. (TOPSOIL)
				0.40	89.35		
	0.80	HSV	125				Stiff orangeish brown and grey slightly gravelly CLAY with occasional silt grade gypsum crystals and occasional rootlets. Gravel is subangular and subrounded fine to coarse of ferruginous siltstone. (WHITBY MUDSTONE FORMATION)
				1.50	88.25		Stiff bluish grey locally orange brown and bluish grey slightly gravelly CLAY with frequent silt grade gypsum crystals. Gravel is subangular and subrounded fine to coarse mudstone and ferruginous siltstone. (WHITBY MUDSTONE FORMATION)
							.. At 1.75-2.0m bgl: Occasional fossilised roots (0.5 to 2mm diam).
				2.90	86.85		End of Trial Pit at 2.90m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: MOB **Checked:** RB

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Trial Pit

Trial Pit No: TPA047

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:** **Ground Level:**	473620E, 255180N 77.00m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	26/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.20	76.80		Brown silty slightly gravelly SAND with some rootlets. Gravel is rounded to subrounded fine to coarse flint and quartz. (TOPSOIL)
	0.40 - 0.90	B					Firm brown-grey mottled orange-brown sandy slightly gravelly CLAY with occasional cobbles and rootlets. Gravel is rounded to subangular fine to coarse quartz, limestone and ironstone. Cobbles are quartz and limestone. (GLACIOFLUVIAL DEPOSITS)
	0.90	HSV	65				
	1.10 - 1.40 1.10 - 1.40	B ES		1.10	75.90		Soft yellow-brown and grey-brown sandy gravelly CLAY. Gravel is angular to subangular fine to coarse mudstone and limestone. (GLACIOFLUVIAL DEPOSITS)
				1.60	75.40		Very stiff very thinly bedded grey occasionally green-grey CLAY with many mudstone fragments and lithorelicts and occasional relict roots. (WHITBY MUDSTONE FORMATION)
				2.40	74.60		Weak very thinly bedded grey MUDSTONE with ferrous staining along bedding planes. (WHITBY MUDSTONE FORMATION)
				2.50	74.50		End of Trial Pit at 2.50m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Sides stable and upright

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: RB **Checked:** CV

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Trial Pit

Trial Pit No: TPA048

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473670E, 255212N	**Scale:** 1:25
			Ground Level:	77.50m OD	
Client:	Ashfield Land		**Date(s):**	26/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.30	ES					Brown silty slightly gravelly SAND with some rootlets. Gravel is rounded to subrounded fine to coarse flint and quartz. (TOPSOIL)
				0.30	77.20		Orange-brown slightly clayey fine to coarse grained SAND with some pockets of firm sandy clay. (GLACIOFLUVIAL DEPOSITS)
				1.40	76.10		Soft yellow-grey very sandy CLAY. (GLACIOFLUVIAL DEPOSITS)
				1.70	75.80		Stiff grey CLAY and yellow-grey CLAY with occasional fossils. (WHITBY MUDSTONE FORMATION)
				2.40	75.10		Very stiff very thinly bedded grey and yellow-grey CLAY with some fossils, relict rootlets and ferrous staining along bedding planes. (WHITBY MUDSTONE FORMATION)
				2.80	74.70		End of Trial Pit at 2.80m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Sides stable and upright

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: RB **Checked:** CV

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Trial Pit

Trial Pit No: TPA049

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473686E, 255242N	**Scale:** 1:25
			Ground Level:	77.20m OD	
Client:	Ashfield Land		**Date(s):**	16/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.45	ES					Greyish brown silty slightly gravelly SAND with some rootlets. Gravel is rounded to subangular fine to coarse quartz and occasional brick. (TOPSOIL)
				0.45	76.75		Brown slightly clayey sandy GRAVEL with occasional cobbles and roots. Gravel is rounded to subrounded fine to coarse quartz and limestone. Cobbles are quartz. (GLACIOFLUVIAL DEPOSITS)
				0.90	76.30		Stiff closely fissured grey and yellow-grey CLAY with occasional roots. (WHITBY MUDSTONE FORMATION)
							..between 1.30m and 1.80m, discrete pocket of sand.
				1.40	75.80		Very stiff very thinly bedded grey and green-grey CLAY with some sand sized crystals of gypsum and relict roots. (WHITBY MUDSTONE FORMATION)
				1.90	75.30		Moderately weak grey LIMESTONE. (MARLSTONE FORMATION)
				2.10	75.10		End of Trial Pit at 2.10m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Sides stable and upright

Groundwater: Small quantity entering through base at completion

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: RB **Checked:** CV

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Trial Pit

Trial Pit No: TPA050

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473720E, 255250N	**Scale:** 1:25
			Ground Level:	78.10m OD	
Client:	Ashfield Land		**Date(s):**	16/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.30	ES					Greyish brown silty gravelly SAND with occasional rootlets. Gravel is rounded to subangular fine to coarse quartz and occasional brick and ash. (TOPSOIL)
	0.30 - 0.80	B		0.30	77.80		Yellow-brown slightly clayey slightly gravelly SAND with occasional clay pockets. Gravel is rounded to subrounded fine to coarse quartz. (GLACIOFLUVIAL DEPOSITS)
							.. Below 0.80m, becomes gravelly.
				1.00	77.10		Stiff grey and yellow-grey CLAY with occasional sand pockets. (WHITBY MUDSTONE FORMATION)
	1.20	HSV	99				
	1.70	HSV	101				
				1.90	76.20		Stiff very thinly bedded grey and green-grey CLAY with some relict roots and plant remains, and sand sized crystals of gypsum. (WHITBY MUDSTONE FORMATION)
	2.10	HSV	86				
				2.80	75.30		End of Trial Pit at 2.80m

1.0 2.0 3.0 4.0 5.0

Remarks:

Stability: Sides stable and upright

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: RB **Checked:** CV

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Trial Pit

Trial Pit No: TPG001

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.60m x 2.00m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474498E, 253355N	**Scale:** 1:25
			Ground Level:	113.55m OD	
Client:	Ashfield Land		**Date(s):**	20/04/17	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.30	ES					Firm brown slightly gravelly sandy CLAY with rootlets. Gravel is angular to subrounded fine to medium of brick and tile fragments, limestone and flint. (TOPSOIL)
				0.30	113.25		Orangish brown gravelly clayey fine SAND. Gravel is angular to subrounded fine to medium of flint and shell fragments. (WELLINGBOROUGH LIMESTONE MEMBER)
				0.60	112.95		Stiff light grey sandy CLAY with thin layers of orange mottled light yellow fine sand and rare fine to medium charcoal fragments. (RUTLAND FORMATION)
	1.40 - 1.80	B		1.40	112.15		Grey clayey sandy GRAVEL of angular sandstone fragments. (STAMFORD MEMBER)
				1.80	111.75		Red gravelly SAND with medium cobble content with thin layers of stiff dark grey clay. Gravel is angular to subangular fine to coarse of ironstone. (NORTHAMPTON SAND FORMATION)
				2.70	110.85		End of Trial Pit at 2.70m

1.0
2.0
3.0
4.0
5.0

Remarks: 1) Trial pit terminated at 2.70m bgl due to hard strata. 2)Backfilled with lightly compacted arisings.

Stability: Stable

Groundwater: No groundwater encountered.

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AA **Checked:** RB

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Trial Pit

Trial Pit No: TPG002 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.60m x 2.00m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474410E, 253428N	**Scale:** 1:25
			Ground Level:	113.70m OD	
Client:	Ashfield Land		**Date(s):**	20/04/17	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.30	ES					Firm brown slightly gravelly slightly sandy CLAY with rootlets. Gravel is subangular to subrounded fine to medium of brick fragments, sandstone, mudstone, flint and limestone. (TOPSOIL)
				0.30	113.40		Stiff to very stiff red mottled grey and orange CLAY. (STAMFORD MEMBER)
				0.50	113.20		Orange gravelly SAND with layers of soft to firm clay and medium cobble content. Gravel is angular to subangular fine to coarse of ironstone. (NORTHAMPTON SAND FORMATION)
	0.90 - 1.50	B					
	2.50	HSV	88	2.50	111.20		Stiff light grey CLAY. (WHITBY MUDSTONE FORMATION)
				3.00	110.70		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks: 1)Backfilled with lightly compacted arisings.

Stability: Stable

Groundwater: No groundwater encountered.

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AA **Checked:** RB

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Trial Pit

Trial Pit No: TPG003

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.60m x 2.00m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474466E, 253486N	**Scale:** 1:25
			Ground Level:	109.20m OD	
Client:	Ashfield Land		**Date(s):**	20/04/17	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.30	ES		0.30	108.90		Firm brown slightly gravelly slightly sandy CLAY with rootlets. Gravel is subangular to subrounded fine to medium of brick fragments, limestone and mudstone. (TOPSOIL)
	0.60	HSV	59	0.60	108.60		Firm light brown slightly sandy CLAY. (WHITBY MUDSTONE FORMATION)
	1.50	B		1.50	107.70		Firm grey mottled orange slightly gravelly CLAY. Gravel is angular to subangular fine of limestone and flint. (WHITBY MUDSTONE FORMATION)
	2.60	HSV	77				Stiff dark grey mottled orange brown CLAY with some angular fine to coarse of fragments of mudstone and flint gravel. (WHITBY MUDSTONE FORMATION)
				3.00	106.20		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks: 1)Backfilled with lightly compacted arisings.

Stability: Stable

Groundwater: No groundwater encountered.

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AA **Checked:** RB

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Trial Pit

Trial Pit No: TPG004

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.60m x 2.00m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474365E, 253524N	**Scale:** 1:25
			Ground Level:	103.35m OD	
Client:	Ashfield Land		**Date(s):**	20/04/17	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.30	ES		0.30	103.05		Firm brown slightly gravelly sandy CLAY with rootlets. Gravel is angular to subangular fine to medium of flint. (TOPSOIL)
	0.80	HSV	59				Firm orange mottled brown and grey slightly silty CLAY. (WHITBY MUDSTONE FORMATION)
	1.70 - 2.00	B		1.00	102.35		Firm light grey CLAY with thin layers of dark and light orangish brown gravelly silty clay with medium cobble content. Gravel is angular to subangular fine to coarse of red mudstone. (WHITBY MUDSTONE FORMATION)
	2.00	HSV	86	2.00	101.35		Firm dark grey CLAY. with occasional angular fragments of mudstone. (WHITBY MUDSTONE FORMATION)
				3.40	99.95		End of Trial Pit at 3.40m

1.0
2.0
3.0
4.0
5.0

Remarks: 1)Backfilled with lightly compacted arisings.

Stability: Stable

Groundwater: No groundwater encountered.

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AA **Checked:** RB

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Trial Pit

Trial Pit No: TPG005 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.70m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473694E, 253919N	**Scale:** 1:25
			Ground Level:	95.85m OD	
Client:	Ashfield Land		**Date(s):**	29/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES					Firm dark reddish brown locally slightly sandy CLAY with frequent rootlets. (TOPSOIL)
				0.35	95.50		
	0.50 - 0.60	B					Firm light reddish brown slightly gravelly CLAY with occasional rootlets. Gravel is subangular and subrounded fine to coarse ironstone. (WHITBY MUDSTONE FORMATION)
				1.00	94.85		
							Stiff bluish grey locally orange brown and bluish grey slightly gravelly CLAY with frequent silt grade gypsum crystals and occasional lenticular inclusions (1-2mm by 20-40mm) of light grey silt. Gravel is subangular and subrounded fine to coarse mudstone and ferruginous siltstone. (WHITBY MUDSTONE FORMATION)
				2.60	93.25		End of Trial Pit at 2.60m

1.0 2.0 3.0 4.0 5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: MOB **Checked:** RB

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Trial Pit

Trial Pit No: TPG006 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.65m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473471E, 253981N	**Scale:** 1:25
			Ground Level:	92.20m OD	
Client:	Ashfield Land		**Date(s):**	29/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES		0.30	91.90		Firm dark reddish brown locally slightly sandy CLAY with frequent rootlets. (TOPSOIL)
	0.50 - 0.60	B					Firm light reddish brown slightly gravelly CLAY with occasional rootlets. Gravel is subangular and subrounded fine to coarse ironstone. (WHITBY MUDSTONE FORMATION)
				1.20	91.00		Stiff bluish grey locally orange brown and bluish grey slightly gravelly CLAY with frequent silt grade gypsum crystals and occasional lenticular inclusions (1-2mm by 20-40mm) of light grey silt. Gravel is subangular and subrounded fine to coarse mudstone and ferruginous siltstone. (WHITBY MUDSTONE FORMATION)
	2.00 - 2.10 2.00	B HSV	117				*.. At 1.9-2.0mm bgl: Occasional relict roots (0.5 to 2mm diam).*
				2.60	89.60		End of Trial Pit at 2.60m

1.0 2.0 3.0 4.0 5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: MOB **Checked:** RB

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Trial Pit

Trial Pit No: TPG007 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473277E, 254036N	**Scale:** 1:25
			Ground Level:	92.80m OD	
Client:	Ashfield Land		**Date(s):**	28/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES					Firm brown locally slightly sandy CLAY with frequent rootlets. (TOPSOIL)
	0.40 - 0.50	B		0.35	92.45		
							Firm to stiff orangeish brown and grey slightly gravelly CLAY with occasional silt grade gypsum crystals and rootlets. Gravel is subangular and subrounded fine to coarse ferruginous siltstone. (WHITBY MUDSTONE FORMATION)
				1.40	91.40		
	2.00	HSV	122				Stiff bluish grey locally orange brown and bluish grey slightly gravelly CLAY with frequent silt grade gypsum crystals. Gravel is subangular and subrounded fine to coarse mudstone and ferruginous siltstone. (WHITBY MUDSTONE FORMATION) *.. At 1.8-2.0m bgl: Occasional relict roots (0.5 to 2mm diam).*
				2.60	90.20		End of Trial Pit at 2.60m

1.0 2.0 3.0 4.0 5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: MOB **Checked:** RB

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Trial Pit

Trial Pit No: TPG008

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.70m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473045E, 254313N	**Scale:** 1:25
			Ground Level:	84.40m OD	
Client:	Ashfield Land		**Date(s):**	28/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30	ES		0.40	84.00		Firm brown locally orange brown locally slightly sandy CLAY with frequent rootlets. (TOPSOIL)
	0.80 - 0.90	B		0.70	83.70		Firm to stiff orangeish brown and grey slightly gravelly CLAY with occasional silt grade gypsum crystals and rootlets. Gravel is subangular and subrounded fine to coarse ferruginous siltstone and limestone. (WHITBY MUDSTONE FORMATION)
	2.50	HSV	123				Stiff bluish grey locally orange brown and bluish grey slightly gravelly CLAY with frequent silt grade gypsum crystals. Gravel is subangular and subrounded fine to coarse mudstone and ferruginous siltstone. (WHITBY MUDSTONE FORMATION)
				2.80	81.60		End of Trial Pit at 2.80m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: MOB **Checked:** RB

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Trial Pit

Trial Pit No: TPG009

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.50m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473317E, 254141N	**Scale:** 1:25
			Ground Level:	88.50m OD	
Client:	Ashfield Land		**Date(s):**	28/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30	ES		0.40	88.10		Firm brown locally orange brown locally slightly sandy CLAY with frequent rootlets. (TOPSOIL)
				0.60	87.90		Firm orangeish brown locally slightly sandy CLAY with occasional rootlets. (WHITBY MUDSTONE FORMATION)
				1.40	87.10		Firm to stiff orangeish brown and grey slightly gravelly CLAY with occasional silt grade gypsum crystals and rootlets. Gravel is subangular and subrounded fine to coarse ferruginous siltstone. (WHITBY MUDSTONE FORMATION)
	1.50	HSV	87				Stiff bluish grey locally orange brown and bluish grey slightly gravelly CLAY with frequent silt grade gypsum crystals. Gravel is subangular and subrounded fine to coarse mudstone and ferruginous siltstone. (WHITBY MUDSTONE FORMATION)
				2.90	85.60		*.. At 2.8m bgl: Occasional relict roots (0.5 to 2mm diam).*
							End of Trial Pit at 2.90m

1.0 2.0 3.0 4.0 5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: MOB **Checked:** RB

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Trial Pit

Trial Pit No: TPG010 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.70m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473515E, 254052N	**Scale:** 1:25
			Ground Level:	92.40m OD	
Client:	Ashfield Land		**Date(s):**	29/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30	ES		0.35	92.05		Firm brown locally slightly sandy CLAY with frequent rootlets. (TOPSOIL)
				1.40	91.00		Stiff orangeish brown and grey slightly gravelly CLAY with occasional silt grade gypsum crystals. Gravel is subangular and subrounded fine to coarse of ferruginous siltstone. (WHITBY MUDSTONE FORMATION)
	2.50 - 2.60	B		2.60	89.80		Stiff bluish grey locally orange brown and bluish grey slightly gravelly CLAY with frequent silt grade gypsum crystals. Gravel is subangular and subrounded fine to coarse mudstone and ferruginous siltstone. (WHITBY MUDSTONE FORMATION) *.. At 1.6-1.8mm bgl: Occasional relict roots (0.5 to 2mm diam).* End of Trial Pit at 2.60m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: MOB **Checked:** RB

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Trial Pit

Trial Pit No: TPG011 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473836E, 253950N	**Scale:** 1:25
			Ground Level:	92.28m OD	
Client:	Ashfield Land		**Date(s):**	01/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 - 0.30	ES		0.30	91.98		Firm dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL)
							Firm reddish brown CLAY. (WHITBY MUDSTONE FORMATION)
	1.00	ES		0.90	91.38		
	1.00	HSV	112				Stiff bluish grey mottled brown CLAY. (WHITBY MUDSTONE FORMATION)
							.. At 1.4m bgl: Sand pocket encountered.
	1.50	B		1.50	90.78		Stiff bluish grey mottled brown CLAY with occasional sand grade gypsum crystals and root fossils. (WHITBY MUDSTONE FORMATION)
	2.00	HSV	103				
	2.80	B					
	3.00	HSV	90	3.00	89.28		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AO **Checked:** RB

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Trial Pit

Trial Pit No: TPG012

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.60m x 2.00m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474322E, 253969N	**Scale:** 1:25
			Ground Level:	95.00m OD	
Client:	Ashfield Land		**Date(s):**	19/04/17	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.40	ES					Brown slightly gravelly silty sandy CLAY with rootlets. Gravel is subangular to subrounded fine to medium of flint. (TOPSOIL)
				0.40	94.60		Firm brown mottled grey CLAY. (WHITBY MUDSTONE FORMATION)
	0.80	HSV	71				
				1.20	93.80		Firm bluish grey CLAY with pockets of orange silt, occasional relict rootlets and partings of silt size selenite. (WHITBY MUDSTONE FORMATION)
				2.20	92.80		Stiff bluish grey CLAY with low cobble content, layers of orange sand and occasional gravel sized fragments of angular to subangular layered red mudstone. (WHITBY MUDSTONE FORMATION)
	2.30	HSV	75				
				3.00	92.00		End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks: 1)Backfilled with lightly compacted arisings.

Stability: Stable

Groundwater: No groundwater encountered.

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AA **Checked:** RB

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Trial Pit

Trial Pit No: TPG013

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474142E, 254028N	**Scale:** 1:25
			Ground Level:	89.88m OD	
Client:	Ashfield Land		**Date(s):**	26/08/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30	ES		0.34	89.54		Stiff brown sandy CLAY with rootlets. (TOPSOIL)
	0.70	D					Stiff brown sandy CLAY with occasional gravel of fine to coarse angular to subrounded of flint. (WHITBY MUDSTONE FORMATION)
	1.20	B		0.90	88.98		Stiff grey mottled brown CLAY with pockets of brown very sandy clay. (WHITBY MUDSTONE FORMATION)
	1.20	HSV	117				*.. 0.90-1.20m bgl: Band of sandy CLAY.*
	2.50	HSV	120				
	2.90	B					
				3.00	86.88		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion.

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPG014

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473997E, 254143N	**Scale:** 1:25
			Ground Level:	88.48m OD	
Client:	Ashfield Land		**Date(s):**	02/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 - 0.30	ES		0.30	88.18		Firm dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL)
				0.80	87.68		Firm light brownish red CLAY. (WHITBY MUDSTONE FORMATION)
	2.00	HSV	94				Stiff very thinly bedded bluish grey CLAY with occasional sand grade gypsum crystals and relict rootlets and rare mudstone lithorelicts. (WHITBY MUDSTONE FORMATION)
	3.00	HSV	93	3.00	85.48		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AO **Checked:** RB

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Trial Pit

Trial Pit No: TPG015 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.50m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473739E, 254141N	**Scale:** 1:25
			Ground Level:	92.40m OD	
Client:	Ashfield Land		**Date(s):**	29/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30	ES		0.35	92.05		Firm brown locally slightly sandy slightly gravelly CLAY with frequent rootlets. Gravel is subangular and subrounded fine to coarse of limestone and ferruginous siltstone. (TOPSOIL)
				1.55	90.85		Stiff orange brown and grey slightly gravelly CLAY with occasional silt grade gypsum crystals and occasional rootlets. Gravel is subangular and subrounded fine to coarse ferruginous siltstone. (WHITBY MUDSTONE FORMATION)
				2.60	89.80		Stiff bluish grey locally orange brown and bluish grey slightly gravelly CLAY with frequent silt grade gypsum crystals. Gravel is subangular and subrounded fine to coarse mudstone and ferruginous siltstone. (WHITBY MUDSTONE FORMATION) *.. At 2.4m bgl: Occasional relict roots.* End of Trial Pit at 2.60m

1.0 2.0 3.0 4.0 5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: MOB **Checked:** RB

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Trial Pit

Trial Pit No: TPG016

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.55m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473576E, 254270N	**Scale:** 1:25
			Ground Level:	86.80m OD	
Client:	Ashfield Land		**Date(s):**	29/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30	ES		0.40	86.40		Firm reddish brown slightly gravelly CLAY with frequent rootlets. Gravel is subangular and subrounded fine to coarse limestone and ironstone. (TOPSOIL)
				0.90	85.90		Firm to stiff orange brown slightly gravelly CLAY with occasional rootlets. Gravel is subangular and subrounded fine to coarse ferruginous mudstone. (WHITBY MUDSTONE FORMATION)
	1.00 - 1.10 1.00	B HSV	118				Stiff bluish grey locally orange brown and bluish grey slightly gravelly CLAY. Gravel is subangular and subrounded fine to coarse mudstone and ferruginous siltstone. (WHITBY MUDSTONE FORMATION)
							.. At 2.0m bgl: Occasional silt grade gypsum crystals.
							.. At 2.1-2.2m bgl: Occasional relict roots.
				2.50	84.30		End of Trial Pit at 2.50m

1.0 2.0 3.0 4.0 5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: MOB **Checked:** RB

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Trial Pit

Trial Pit No: TPG017

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473376E, 254275N	**Scale:** 1:25
			Ground Level:	86.54m OD	
Client:	Ashfield Land		**Date(s):**	08/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.10	ES					Stiff dark brown CLAY with rootlets. (TOPSOIL)
				0.28	86.26		Stiff yellowish brown and greyish brown slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of flint. (WHITBY MUDSTONE FORMATION)
							.. 0.70-1.60m bgl: Becoming grey mottled light brown.
	0.90	B					
	0.90	HSV	121				
	1.80	HSV	110				
				2.10	84.44		Stiff dark grey CLAY. (WHITBY MUDSTONE FORMATION)
				2.80	83.74		Very weak weathered MUDSTONE recovered as a clayey angular fine to coarse GRAVEL with a high cobble content and occasional gypsum crystals. (WHITBY MUDSTONE FORMATION)
	2.90	B					
				3.00	83.54		End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPG018

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.70m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473016E, 254772N	**Scale:** 1:25
			Ground Level:	81.70m OD	
Client:	Ashfield Land		**Date(s):**	29/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES		0.30	81.40		Firm brown slightly gravelly CLAY with frequent rootlets. Gravel is subangular and subrounded fine to coarse quartzite and ferruginous siltstone. (TOPSOIL)
	0.40 - 0.50	B					Stiff light orange brown and grey silty CLAY with occasional rootlets. (WHITBY MUDSTONE FORMATION)
	1.00	HSV	107	0.85	80.85		Stiff bluish grey locally orange brown and bluish grey slightly gravelly CLAY with occasional silt grade gypsum crystals and lenticular inclusions (1-2mm by 30-50mm) of light grey silt. Gravel is subangular and subrounded fine to coarse mudstone and ferruginous siltstone. (WHITBY MUDSTONE FORMATION)
	2.00 - 2.10	B					*.. At 2.0m bgl: Occasional silt grade gypsum crystals and relict roots.*
				2.60	79.10		End of Trial Pit at 2.60m

1.0 2.0 3.0 4.0 5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: MOB **Checked:** RB

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Trial Pit

Trial Pit No: TPG019

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473089E, 254658N	**Scale:** 1:25
			Ground Level:	80.14m OD	
Client:	Ashfield Land		**Date(s):**	09/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30	ES		0.30	79.84		Firm dark brown CLAY. (TOPSOIL)
				0.70	79.44		Firm orangeish brown mottled light grey CLAY. (WHITBY MUDSTONE FORMATION)
	1.00	B					Stiff greenish grey mottled bluish grey CLAY. (WHITBY MUDSTONE FORMATION)
	2.60	B		2.60	77.54		Weak dark grey and greenish grey MUDSTONE with frequent fossil remains. (WHITBY MUDSTONE FORMATION)
	2.60	HSV	100				
				3.00	77.14		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Sides stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Trial Pit

Trial Pit No: TPG020 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473343E, 254799N	**Scale:** 1:25
			Ground Level:	81.46m OD	
Client:	Ashfield Land		**Date(s):**	02/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 - 0.30	ES		0.30	81.16		Firm dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL)
				0.70	80.76		Firm reddish browm slightly gravelly silty CLAY. Gravel is rounded fine to coarse of quartz and flint. (WHITBY MUDSTONE FORMATION)
	1.00	HSV	130				Stiff thinly bedded bluish grey mottled brown CLAY with abundant mudstone lithorelicts and root fossils and occasional sand grade gypsum crystals. (WHITBY MUDSTONE FORMATION)
	1.30	B					*.. At 1.2-1.4m bgl: Large sand lense 1.5m x 0.2m*
	2.00	HSV	130				
	2.80	B					
	3.00	HSV	78	3.00	78.46		End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AO **Checked:** RB

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Trial Pit

Trial Pit No: TPG021

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473469E, 254538N	**Scale:** 1:25
			Ground Level:	84.37m OD	
Client:	Ashfield Land		**Date(s):**	08/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES		0.30	84.07		Stiff dark brown slightly sandy slightly gravelly CLAY with rootlets. (TOPSOIL)
				0.60	83.77		Stiff yellowish brown and brown slightly sandy slightly gravelly CLAY with pockets of brown very sandy clay. (WHITBY MUDSTONE FORMATION)
	0.80 0.80	D HSV	91				Stiff grey mottled greyish brown CLAY. (WHITBY MUDSTONE FORMATION) *.. 1.30m bgl: Becoming bluish dark grey.* *.. 2.90m bgl: Thinly laminated and contains mudstone lithorelicts.*
	2.50	B		2.90	81.47		End of Trial Pit at 2.90m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPG022

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.70m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473651E, 254434N	**Scale:** 1:25
			Ground Level:	84.30m OD	
Client:	Ashfield Land		**Date(s):**	29/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES					Firm brown slightly gravelly CLAY with frequent rootlets. Gravel is subangular and subrounded fine to coarse of ferruginous siltstone and limestone. (TOPSOIL)
				0.44	83.86		Stiff reddish brown slightly gravelly CLAY with occasional rootlets. Gravel is subangular and subrounded fine to coarse of ferruginous siltstone and mudstone. (WHITBY MUDSTONE FORMATION)
							.. At 1.1m bgl: Becoming sandy.
				1.40	82.90		Stiff bluish grey locally orange brown and bluish grey slightly gravelly CLAY with occasional silt grade gypsum crystals. Gravel is subangular and subrounded fine to coarse mudstone and ferruginous siltstone. (WHITBY MUDSTONE FORMATION)
				2.40	81.90		End of Trial Pit at 2.40m

1.0 2.0 3.0 4.0 5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: MOB **Checked:** RB

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Trial Pit

Trial Pit No: TPG023

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.70m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473834E, 254371N	**Scale:** 1:25
			Ground Level:	86.00m OD	
Client:	Ashfield Land		**Date(s):**	29/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES		0.35	85.65		Firm brown slightly gravelly CLAY with frequent rootlets. Gravel is subangular and subrounded fine to coarse of ferrouginous siltstone and limestone. (TOPSOIL)
				0.75	85.25		Stiff orange brown and light brown slightly gravelly CLAY with occasional rootlets. Gravel is subangular and subrounded fine to coarse ferruginous siltstone and mudstone. (WHITBY MUDSTONE FORMATION)
	1.50	HSV	105				Stiff bluish grey locally orange brown and bluish grey slightly gravelly CLAY with occasional silt grade gypsum crystals. Gravel is subangular and subrounded fine to coarse mudstone and ferruginous siltstone. (WHITBY MUDSTONE FORMATION)
	1.90 - 2.00	B					*.. At 2.0m bgl: Gypsum crystals becoming frequent.*
				2.70	83.30		End of Trial Pit at 2.70m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: MOB **Checked:** RB

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Trial Pit

Trial Pit No: TPG024

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474036E, 254277N	**Scale:** 1:25
			Ground Level:	86.91m OD	
Client:	Ashfield Land		**Date(s):**	30/08/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 - 0.30	ES		0.30	86.61		Firm dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL)
	0.80 - 1.20	B		0.80	86.11		Stiff greyish brown mottled blue CLAY with frequent rootlets (<1mm). (WHITBY MUDSTONE FORMATION)
	1.00	HSV	97	1.20	85.71		Stiff brown mottled grey slightly sandy CLAY with occasional rootlets. (WHITBY MUDSTONE FORMATION)
	2.00	HSV	130	2.70	84.21		Very stiff bluish grey mottled brown CLAY with occasional sand sized gypsum crystals. (WHITBY MUDSTONE FORMATION)
	3.00	HSV	130	3.00	83.91		Stiff to very stiff dark bluish grey mottled reddish brown CLAY with occasional subangular fine to coarse gravel sized fragments of siltstone and mudstone. (WHITBY MUDSTONE FORMATION)
							End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AO **Checked:** RB

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Trial Pit

Trial Pit No: TPG025 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474204E, 254243N	**Scale:** 1:25
			Ground Level:	92.77m OD	
Client:	Ashfield Land		**Date(s):**	30/08/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 - 0.30	ES		0.30	92.47		Firm dark brown slightly sandy CLAY with frequent rootlets. Sand is fine to coarse. (TOPSOIL)
				0.90	91.87		Firm bluish grey mottled red slightly CLAY. (WHITBY MUDSTONE FORMATION)
				2.30	90.47		Stiff to very stiff bluish grey slightly sandy CLAY with mudstone and sand grade gypsum crystals. (WHITBY MUDSTONE FORMATION)
	2.50	B		3.00	89.77		Stiff thinly bedded bluish grey CLAY with frequent mudstone lithorelicts and occasional sand grade gypsum crystals and relict rootlets. (WHITBY MUDSTONE FORMATION)
							End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AO **Checked:** RB

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Trial Pit

Trial Pit No: TPG026 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:** **Ground Level:**	474097E, 254480N 89.79m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	26/08/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES		0.30	89.49		Stiff dark brown slightly gravelly slightly sandy CLAY. Gravel is fine to coarse angular to subrounded of flint and rootlets. (TOPSOIL)
	0.50	D					Stiff brown sandy slightly gravelly CLAY. Gravel is fine to coarse subrounded to rounded of quartz. (GLACIAL TILL)
	1.10	B		0.90	88.89		Stiff grey mottled brown sandy CLAY. (WHITBY MUDSTONE FORMATION)
	1.10	HSV	114				
	2.00	HSV	117				*.. 2.00m bgl: Occasional ironstone nodules.*
	2.60	B					
	2.80	HSV	104				
				3.00	86.79		End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion.

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPG027

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473532E, 254701N	**Scale:** 1:25
			Ground Level:	81.82m OD	
Client:	Ashfield Land		**Date(s):**	02/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 - 0.30	ES		0.30	81.52		Firm dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL)
				0.70	81.12		Firm reddish brown slightly gravelly CLAY. Gravel is rounded fine to coarse of quartz and flint. (WHITBY MUDSTONE FORMATION)
	1.00	HSV	105				Stiff thinly bedded bluish grey mottled brown CLAY with abundant mudstone lithorelicts and relict roots. (WHITBY MUDSTONE FORMATION)
							.. At 1.1m bgl: Pocket of fine to coarse sand.
	2.00	HSV	130				
							.. At 2.5m bgl: Occasional sand grade gypsum crystals.
	2.80	B					
	3.00	HSV	85	3.00	78.82		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AO **Checked:** RB

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Trial Pit

Trial Pit No: TPG028

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473159E, 254845N	**Scale:** 1:25
			Ground Level:	79.54m OD	
Client:	Ashfield Land		**Date(s):**	02/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 - 0.30	ES		0.30	79.24		Firm dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL)
				0.90	78.64		Firm reddish brown mottled grey slightly gravelly CLAY. Gravel is rounded fine and medium of quartz. (WHITBY MUDSTONE FORMATION)
	1.00	HSV	130				Stiff thinly bedded bluish grey mottled brown CLAY with abundant mudstone lithorelicts and root fossils and occasional sand grade gypsum crystals. Lithorelicts increasing with depth. (WHITBY MUDSTONE FORMATION)
	1.50	B					
	2.00	HSV	130				
	2.80	B					
	3.00	HSV	85	3.00	76.54		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AO **Checked:** RB

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Trial Pit

Trial Pit No: TPG029

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.00m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473242E, 255062N	**Scale:** 1:25
			Ground Level:	88.50m OD	
Client:	Ashfield Land		**Date(s):**	27/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.30	ES					Brown silty gravelly SAND with occasional rootlets. Gravel is rounded to angular fine to coarse quartz and flint. (TOPSOIL)
				0.30	88.20		Orange-brown silty gravelly fine to coarse grained SAND. Gravel is rounded to angular fine to coarse quartz and ironstone. (GLACIOFLUVIAL DEPOSITS)
	1.30 - 1.50	B		1.30	87.20		Orange-brown slightly silty gravelly fine to medium grained SAND. Gravel is angular to subangular fine to coarse limestone and ironstone. (GLACIOFLUVIAL DEPOSITS)
				1.70	86.80		Orange-brown silty in parts slightly clayey slightly gravelly fine to medium grained SAND with occasional pockets of clay. Gravel is angular to subangular fine to coarse limestone and ironstone. (GLACIOFLUVIAL DEPOSITS)
				2.10	86.40		End of Trial Pit at 2.10m

1.0
2.0
3.0
4.0
5.0

Remarks: 1. Pit terminated at 2.10m for soakaway infiltration test.

Stability: Sides stable and upright

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: RB **Checked:** CV

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Trial Pit

Trial Pit No: TPG030

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.00m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473418E, 254960N	**Scale:** 1:25
			Ground Level:	86.30m OD	
Client:	Ashfield Land		**Date(s):**	27/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.30	ES					Greyish brown silty slightly gravelly SAND with occasional rootlets. Gravel is subrounded to subangular fine to medium quartz and limestone. (TOPSOIL)
				0.30	86.00		Orange-brown silty gravelly fine to medium grained SAND. Gravel is rounded to angular fine to coarse ironstone, limestone and occasional quartz. (GLACIOFLUVIAL DEPOSITS)
							.. Occasional rootlets to 0.80m.
				1.50	84.80		Orange-brown slightly silty slightly gravelly fine to coarse grained SAND. Gravel is subangular to angular fine to coarse ironstone. (GLACIOFLUVIAL DEPOSITS)
				1.90	84.40		End of Trial Pit at 1.90m

1.0
2.0
3.0
4.0
5.0

Remarks: 1. Pit terminated at 1.90m for soakaway infiltration test.

Stability: Sides stable and upright

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: RB **Checked:** CV

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Trial Pit

Trial Pit No: TPG031

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473629E, 254879N	**Scale:** 1:25
			Ground Level:	84.40m OD	
Client:	Ashfield Land		**Date(s):**	20/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES		0.30	84.10		Dark brown slightly clayey fine to coarse SAND with rootlets. (TOPSOIL)
				0.70	83.70		Light brown gravelly fine to coarse SAND with a medium cobbles content. Gravel and cobble are fine to coarse subangular to subrounded of very weak weathered sandstone. (GLACIOFLUVIAL DEPOSITS)
	1.60	B					Light brown slightly clayey gravelly fine to coarse SAND. Gravel is fine to coarse angular to subrounded of ironstone. (GLACIOFLUVIAL DEPOSITS)
							.. 0.70-0.80m bgl: Occasional bands of soft light brown mottled light grey very sandy CLAY.
							.. 1.80m bgl: Becoming clayey.
	2.80	B					
				3.10	81.30		End of Trial Pit at 3.10m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion.

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPG032

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473791E, 254816N	**Scale:** 1:25
			Ground Level:	83.20m OD	
Client:	Ashfield Land		**Date(s):**	20/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES		0.30	82.90		Dark brown clayey slightly gravelly fine to medium SAND with rootlets. Gravel is fine to coarse angular to subrounded of ash and flint. (TOPSOIL)
							Brown clayey fine SAND. (GLACIOFLUVIAL DEPOSITS)
	1.20	B		1.10	82.10		Brown and light greyish brown very clayey fine to medium SAND. (GLACIOFLUVIAL DEPOSITS)
				2.20	81.00		Stiff brown sandy gravelly CLAY with a medium cobble content. Gravel and cobbles are fine to coarse subrounded to rounded of flint. (GLACIOFLUVIAL DEPOSITS)
	2.90	B		2.75	80.45		Soft greyish brown sandy CLAY. (GLACIOFLUVIAL DEPOSITS)
				2.95	80.25		End of Trial Pit at 2.95m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion.

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPG033

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473983E, 254670N	**Scale:** 1:25
			Ground Level:	86.58m OD	
Client:	Ashfield Land		**Date(s):**	26/08/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.15	ES					Dark brown clayey fine to medium SAND with rootlets. (TOPSOIL)
				0.30	86.28		
	0.50	B					Brown clayey fine to coarse SAND. (GLACIAL TILL)
				0.65	85.93		
	0.90	HSV	117				Stiff brown mottled grey sandy CLAY. (WHITBY MUDSTONE FORMATION)
	1.60	D					
							.. 2.00m bgl: dark grey
	2.30	HSV	124				
	2.70	B					
				2.90	83.68		End of Trial Pit at 2.90m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion.

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPG034

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474067E, 255040N	**Scale:** 1:25
			Ground Level:	84.08m OD	
Client:	Ashfield Land		**Date(s):**	13/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.25	ES		0.30	83.78		Stiff dark brown very sandy CLAY with rootlets. (TOPSOIL)
							Stiff light brown very sandy CLAY with roots, rootlets and occasional gravel of fine to coarse subrounded to rounded of flint. (GLACIOFLUVIAL DEPOSITS)
							.. 1.10-1.80m bgl: Becoming a yellowish brown very clayey fine to medium SAND.
	1.50	B					
				1.80	82.28		Stiff grey slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of mudstone with occasional pockets of clayey sand. (WHITBY MUDSTONE FORMATION)
	2.00	HSV	126				
							.. 2.40m bgl: Becoming bluish grey.
	2.60	B					
▼				2.95	81.13		End of Trial Pit at 2.95m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: Slight groundwater seepage at base of pit.

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPG035 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473859E, 255008N	**Scale:** 1:25
			Ground Level:	81.02m OD	
Client:	Ashfield Land		**Date(s):**	12/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30	ES		0.35	80.67		Stiff dark brown very sandy CLAY with rootlets. (TOPSOIL)
	0.60	D					Soft brown very sandy slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded of flint. (GLACIOFLUVIAL DEPOSITS)
	1.50	B		0.90	80.12		Brown and light grey clayey very gravelly fine to coarse SAND. Gravel is fine to coarse subrounded to rounded of flint. (GLACIOFLUVIAL DEPOSITS) *.. 1.10-1.80m bgl: Becoming a yellowish brown very clayey fine to medium SAND.*
	3.00	B		2.00	79.02		Brown slightly clayey fine SAND. (GLACIOFLUVIAL DEPOSITS) *.. 2.40m bgl: Becoming bluish grey.* *.. 2.90m bgl: Becoming fine to coarse.*
▼				3.20	77.82		End of Trial Pit at 3.20m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Unstable, collapsing at base of trial pit

Groundwater: Moderate groundwater seepage at base

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPG036

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473735E, 254916N	**Scale:** 1:25
			Ground Level:	84.15m OD	
Client:	Ashfield Land		**Date(s):**	20/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.10	ES					Dark brown slightly clayey fine to coarse SAND with rootlets. (TOPSOIL)
				0.27	83.88		
							Light brown fine slightly gravelly SAND. Gravel is angular to rounded fine to coarse flint. (GLACIOFLUVIAL DEPOSITS)
							.. 0.60m bgl: No gravel.
	1.00	B					
				2.90	81.25		
	3.00	B					Interbedded firm light greyish brown sandy CLAY and light brown SAND. (GLACIOFLUVIAL DEPOSITS)
				3.10	81.05		End of Trial Pit at 3.10m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion.

Stability: Unstable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPG037

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473676E, 255075N	**Scale:** 1:25
			Ground Level:	78.50m OD	
Client:	Ashfield Land		**Date(s):**	27/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.30	ES					Soft dark brown slightly sandy slightly gravelly CLAY with some roots and rootlets. Gravel is rounded medium to coarse quartz. (TOPSOIL)
				0.30	78.20		(Uncompact) yellow-grey, grey and orange-brown organic SILT with occasional plant remains. (ALLUVIUM)
	0.60 - 0.90	B					
	0.90	HSV	26				
	1.00 - 1.20	B		1.00	77.50		Very soft orange-brown and grey organic CLAY with some partially decomposed plant remains. (ALLUVIUM)
	1.20	HSV	5				
				1.40	77.10		Pinkish grey gravelly fine to coarse grained SAND with some clay pockets. Gravel is rounded medium to coarse quartz. (ALLUVIUM)
				2.20	76.30		Brown-grey sandy GRAVEL of angular to subrounded fine to coarse sized flint, quartz and ironstone. (ALLUVIUM)
				2.60	75.90		End of Trial Pit at 2.60m

1.0 2.0 3.0 4.0 5.0

Remarks:

Stability: Collapse of sides from base to 1.70m

Groundwater: Entering in running sand condition below 1.70m

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: RB **Checked:** CV

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Trial Pit

Trial Pit No: TPG038

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.10m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473516E, 255136N	**Scale:** 1:25
			Ground Level:	81.85m OD	
Client:	Ashfield Land		**Date(s):**	27/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.30	ES					Greyish brown slightly silty slightly gravelly SAND with occasional rootlets. Gravel is subrounded to subangular fine to medium quartz and ironstone. (TOPSOIL)
				0.30	81.55		Orange-brown silty gravelly fine to medium grained SAND. Gravel is rounded to angular fine to coarse ironstone and quartz. (GLACIOFLUVIAL DEPOSITS)
	1.30 - 1.50	B		1.30	80.55		Yellow-brown slightly gravelly medium grained SAND. Gravel is rounded to angular fine to coarse quartz and ironstone. (GLACIOFLUVIAL DEPOSITS)
				2.20	79.65		End of Trial Pit at 2.20m

1.0
2.0
3.0
4.0
5.0

Remarks: 1. Pit terminated at 2.20m for soakaway infiltration test.

Stability: Sides stable and upright

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: RB **Checked:** CV

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Trial Pit

Trial Pit No: TPG039

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.40m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473354E, 255197N	**Scale:** 1:25
			Ground Level:	85.65m OD	
Client:	Ashfield Land		**Date(s):**	27/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.30	ES					Brown silty gravelly SAND with occasional rootlets. Gravel is rounded to angular fine to coarse quartz and flint. (TOPSOIL)
				0.30	85.35		Yellow-brown gravelly medium grained SAND. Gravel is rounded to angular fine to coarse quartz, limestone and flint. (GLACIOFLUVIAL DEPOSITS)
	0.70 - 0.90	B					
				1.80	83.85		Pinkish grey fine to coarse grained SAND. (GLACIOFLUVIAL DEPOSITS)
				2.10	83.55		End of Trial Pit at 2.10m

1.0
2.0
3.0
4.0
5.0

Remarks: 1. Pit terminated at 2.10m for soakaway infiltration test.

Stability: Minor spalling from base to surface

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: RB **Checked:** CV

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Trial Pit

Trial Pit No: TPG040 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 1.80m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473210E, 255255N	**Scale:** 1:25
			Ground Level:	85.50m OD	
Client:	Ashfield Land		**Date(s):**	27/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.30	ES		0.30	85.20		Brown silty slightly gravelly SAND with some rootlets. Gravel is rounded to subrounded fine to coarse flint and quartz. (TOPSOIL)
				1.40	84.10		Orange-brown silty slightly gravelly fine to coarse grained SAND with occasional roots. Gravel is subangular fine to coarse flint and quartz. (GLACIOFLUVIAL DEPOSITS)
				1.90	83.60		Yellow-brown gravelly fine to coarse grained SAND. Gravel is angular and tabular fine to coarse ironstone. (GLACIOFLUVIAL DEPOSITS) *.. Occasional roots to 1.60m.*
				2.20	83.30		Yellow-brown slightly silty slightly gravelly fine to coarse grained SAND. Gravel is subrounded to subangular fine to coarse quartz and ironstone. (GLACIOFLUVIAL DEPOSITS)
							End of Trial Pit at 2.20m

1.0
2.0
3.0
4.0
5.0

Remarks: 1. Pit terminated at 2.20m for soakaway infiltration test.

Stability: Sides stable and upright

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: RB **Checked:** CV

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Trial Pit

Trial Pit No: TPG041

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473225E, 255394N	**Scale:** 1:25
			Ground Level:	82.50m OD	
Client:	Ashfield Land		**Date(s):**	16/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.20	ES					Greyish brown silty SAND with some roots and rootlets. (MADE GROUND)
				0.20	82.30		Light brown slightly gravelly medium grained SAND. Gravel is angular to subrounded fine to medium quartz. (GLACIOFLUVIAL DEPOSITS)
							.. Occasional roots to 0.90m.
				1.80	80.70		End of Trial Pit at 1.80m

1.0
2.0
3.0
4.0
5.0

Remarks: 1. Pit excavated in former sand pit. 2. Terminated at 1.80m, access restricted by dense vegetation.

Stability: Sides stable and upright

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: RB **Checked:** CV

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Trial Pit

Trial Pit No: TPG042

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473348E, 255339N	**Scale:** 1:25
			Ground Level:	84.00m OD	
Client:	Ashfield Land		**Date(s):**	27/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.30	ES					Greyish brown slightly silty slightly gravelly SAND with some roots and rootlets. Gravel is subrounded to angular fine to coarse quartz and flint. (TOPSOIL)
				0.30	83.70		Yellow-brown slightly gravelly medium grained SAND with occasional roots. Gravel is angular to subrounded fine to coarse flint and quartz. (GLACIOFLUVIAL DEPOSITS)
							.. Roots absent below 1.90m.
				2.90	81.10		End of Trial Pit at 2.90m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Sides stable and upright

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: RB **Checked:** CV

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Trial Pit

Trial Pit No: TPG044

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473609E, 255131N	**Scale:** 1:25
			Ground Level:	77.50m OD	
Client:	Ashfield Land		**Date(s):**	26/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.30	ES					Greyish brown silty SAND with occasional rootlets. Gravel is subrounded medium flint. (TOPSOIL)
				0.30	77.20		Orange-brown silty fine to coarse grained SAND. (GLACIOFLUVIAL DEPOSITS)
	1.20 - 1.60	B					*.. Below 1.20m, becoming slightly clayey in parts with occasional pockets of sandy clay.*
							.. Below 1.80m, with occasional cobbles of limestone.
				2.20	75.30		Stiff grey CLAY with some fine to medium gravel sized fossils. (WHITBY MUDSTONE FORMATION)
							.. Becoming thinly bedded with occasional mudstone lithorelicts below 2.50m.
				2.80	74.70		End of Trial Pit at 2.80m

1.0
2.0
3.0
4.0
5.0

Remarks:

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Stability: Sides stable and upright

Groundwater: No groundwater encountered

Logged: RB **Checked:** CV

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Trial Pit

Trial Pit No: TPG045

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473697E, 255283N	**Scale:** 1:25
			Ground Level:	78.45m OD	
Client:	Ashfield Land		**Date(s):**	16/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.30	ES					Greyish brown silty slightly gravelly SAND with occasional rootlets. Gravel is rounded to subangular fine to coarse flint, quartz and occasional ceramic. (MADE GROUND)
				0.30	78.15		Yellow-brown slightly silty gravelly SAND with some pockets of soft slightly gravelly clay. Gravel is rounded to subangular fine to coarse limestone, flint, quartz and occasional ash. (MADE GROUND)
	0.80 - 1.10	B					
	0.80 - 1.10	ES					
				1.40	77.05		Yellow-brown clayey sandy GRAVEL with occasional cobbles and some pockets of sandy gravelly clay. Gravel is subangular fine to coarse mudstone and limestone. Cobbles are limestone. (MARLSTONE FORMATION)
	1.50 - 1.90	B					
				1.90	76.55		Extremely weak very thinly bedded light grey fine to medium grained SANDSTONE with some ironstone nodules of up to cobble size. (MARLSTONE FORMATION)
				3.10	75.35		End of Trial Pit at 3.10m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Sides stable and upright

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: RB **Checked:** CV

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Trial Pit

Trial Pit No: TPG046 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472403E, 254552N	**Scale:** 1:25
			Ground Level:	84.41m OD	
Client:	Ashfield Land		**Date(s):**	05/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.30	ES					Firm greyish brown slightly sandy slightly gravelly CLAY with occasional rootlets. Gravel is subangular to rounded fine to coarse flint and quartzite. (TOPSOIL)
				0.30	84.11		Stiff closley fissured yellow grey slightly sandy CLAY with occasional rootlets. (WHITBY MUDSTONE FORMATION)
				0.70	83.71		Stiff brown and grey slightly sandy CLAY. (WHITBY MUDSTONE FORMATION)
	1.50 - 1.90	B					*.. at 1.5m bgl: Becoming very thinly bedded with occasional mudstone lithorelicts.*
	1.90	HSV	104	1.90	82.51		Stiff very thinly bedded grey and greyish brown CLAY with occasional sand grade crystals of gypsum and mudstone lithorelicts. (WHITBY MUDSTONE FORMATION)
				3.00	81.41		Very stiff grey CLAY with abundant mudstone lithorelicts and sand grade gypsum crystals. (WHITBY MUDSTONE FORMATION)
				3.40	81.01		End of Trial Pit at 3.40m

1.0 2.0 3.0 4.0 5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: RB **Checked:** CV

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Trial Pit

Trial Pit No: TPG047

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472175E, 254662N	**Scale:** 1:25
			Ground Level:	90.44m OD	
Client:	Ashfield Land		**Date(s):**	13/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.30	90.14		Firm dark brown sandy gravelly CLAY with a medium cobble content. Cobbles and gravel are fine to coarse angular to subrounded of brick and concrete. (MADE GROUND)
	0.50	ES					Stiff brown sandy gravelly CLAY with a medium cobble content. Gravel and cobbles are fine to coarse angular to subrounded of brick, concrete, coal, flint, limestone, shell, glass and ironstone. (MADE GROUND)
	0.90	B					
							.. 1.00m bgl: Becoming a stiff grey slightly gravelly CLAY with a low cobble content.
				1.70	88.74		Stiff dark brownish, dark grey sandy CLAY with roots and rootlets. (WHITBY MUDSTONE FORMATION)
	2.20	B					
	2.20	HSV	80				
				2.75	87.69		Firm yellowish brown CLAY. (WHITBY MUDSTONE FORMATION)
	2.80	D					
	2.80	HSV	58				
				3.00	87.44		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPG049

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:** **Ground Level:**	472173E, 254781N 83.37m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	13/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.10	ES					Stiff dark brown sandy CLAY with rootlets. (TOPSOIL)
				0.20	83.17		Stiff becoming firm yellowish brown CLAY with rootlets. (WHITBY MUDSTONE FORMATION)
	0.50	HSV	85				
	0.70	B					
	0.80	HSV	65				
				1.00	82.37		Brown and grey very clayey gravelly fine to coarse subangular to rounded SANDSTONE. (WHITBY MUDSTONE FORMATION)
				1.20	82.17		Stiff grey mottled light brown CLAY. (WHITBY MUDSTONE FORMATION)
	1.40	HSV	119				*.. 1.50m bgl: with occasional fine to coarse subangular to subrounded of mudstone gravel.*
	2.70	B					*.. 2.70m bgl: Relict rootlets present.*
				3.10	80.27		End of Trial Pit at 3.10m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPG050 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472266E, 254750N	**Scale:** 1:25
			Ground Level:	84.08m OD	
Client:	Ashfield Land		**Date(s):**	13/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.15	ES		0.28	83.80		Stiff dark brown very sandy slightly gravelly CLAY with rootlets. Gravel is fine to coarse, angular to rounded of flint and ironstone. (TOPSOIL)
	0.90	HSV	97				Stiff greyish light brown CLAY. (WHITBY MUDSTONE FORMATION) *.. 0.50m bgl: Becoming mottled grey.* *.. 0.90m bgl: Becoming predominantly grey.*
	1.70	B					
				2.10	81.98		Stiff thickly laminated bluish grey CLAY with gypsum, occasional relict rootlets and rare medium to coarse subrounded gravel of mudstone. (WHITBY MUDSTONE FORMATION)
	3.00	B					
				3.25	80.83		End of Trial Pit at 3.25m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPG051

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472472E, 254698N	**Scale:** 1:25
			Ground Level:	81.53m OD	
Client:	Ashfield Land		**Date(s):**	05/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30	ES		0.20	81.33		Soft dark brown slightly sandy slightly gravelly CLAY. Gravel is fine and medium angular and subangular ironstone and flint. (TOPSOIL)
				0.40	81.13		Firm orange brown CLAY with occasional rootlets. (WHITBY MUDSTONE FORMATION)
	1.00	B					Stiff closely fissured grey mottled orange brown slightly gravelly CLAY with occasional rootlets. Gravel is subangular and subrounded fine and medium flint. (WHITBY MUDSTONE FORMATION)
	1.00	HSV	150				*.. becoming very stiff below 1.00m.*
				1.50	80.03		Stiff blue grey mottled brown CLAY. (WHITBY MUDSTONE FORMATION)
				3.00	78.53		End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: JF **Checked:** RB

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Trial Pit

Trial Pit No: TPG052

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472641E, 254616N	**Scale:** 1:25
			Ground Level:	79.39m OD	
Client:	Ashfield Land		**Date(s):**	05/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES		0.25	79.14		Stiff brown slightly sandy occasionally gravelly CLAY. Gravel is fine angular to subangular of brick and flint. (TOPSOIL)
	0.70	B		0.85	78.54		Firm brown sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded of flint and ironstone. (WHITBY MUDSTONE FORMATION)
	1.60	D					Stiff light grey mottled light brown CLAY. (WHITBY MUDSTONE FORMATION)
	1.60	HSV	90				
							.. 1.80m bgl: Becoming bluish grey.
	2.10	HSV	91				
							.. 2.40m bgl: with relict rootlets and gypsum crystals.
	2.60	B					
	2.60	HSV	75				
▼				2.85	76.54		Light greyish brown fossiliferous LIMESTONE. Recovered as a fine to coarse angular GRAVEL with a medium cobble content. (MARLSTONE FORMATION)
				2.90	76.49		End of Trial Pit at 2.90m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: Groundwater seepage at 2.85m bgl

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPG056

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472433E, 255107N	**Scale:** 1:25
			Ground Level:	80.23m OD	
Client:	Ashfield Land		**Date(s):**	22/08/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.30	ES					Stiff greyish brown sandy slightly gravelly CLAY with occasional rootlets. Gravel is subangular to rounded fine to coarse quartz and flint. (TOPSOIL)
				0.30	79.93		Firm orangeish brown mottled grey sandy CLAY. (WHITBY MUDSTONE FORMATION)
	0.70 - 1.10	B		0.70	79.53		Stiff grey and orange brown sandy CLAY. (WHITBY MUDSTONE FORMATION)
				1.40	78.83		Stiff grey and orange brown sandy CLAY with occasional relict rootlets. (WHITBY MUDSTONE FORMATION)
	2.00 - 2.30	B					*.. At 2.0m bgl: Becoming fissile with occasional extremely weak mudstone fragments.*
							.. At 2.5m bgl: Occasional ferrous staining.
				3.10	77.13		Weak purpleish brown, greenish grey and orange brown ferruginous MUDSTONE with occasional shell fragments and dissolution voids. (MARLSTONE FORMATION)
				3.30	76.93		End of Trial Pit at 3.30m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: RB **Checked:** CV

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Trial Pit

Trial Pit No: TPG057

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472272E, 255242N	**Scale:** 1:25
			Ground Level:	84.62m OD	
Client:	Ashfield Land		**Date(s):**	25/08/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 0.20	D ES		0.30	84.32		Stiff dark brown silty sandy slightly gravelly CLAY with rootlets. Gravel is angular to subrounded fine to coarse quartz. (TOPSOIL)
	0.60 0.60	B HSV	147	0.72	83.90		Stiff brown and grey mottled light brown CLAY with occasional rootlets. (WHITBY MUDSTONE FORMATION)
	0.90 0.90	D HSV	143				Stiff grey mottled brown CLAY. (WHITBY MUDSTONE FORMATION)
	2.70	B		2.50	82.12		Very weak grey MUDSTONE. (WHITBY MUDSTONE FORMATION)
				3.15	81.47		End of Trial Pit at 3.15m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion.

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPG058 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472315E, 255357N	**Scale:** 1:25
			Ground Level:	84.59m OD	
Client:	Ashfield Land		**Date(s):**	25/08/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.15 0.15	D ES		0.30	84.29		Stiff dark brown slightly sandy slightly gravelly CLAY with rootlets. Gravel is angular to subrounded fine to coarse quartz, flint and mudstone. (TOPSOIL)
	0.60 0.60	D HSV	65	1.00	83.59		Firm brown and grey sandy CLAY. (GLACIAL TILL)
	1.25	HSV	95				Stiff grey mottled orange brown slightly sandy CLAY with occasional pockets of firm orange brown sandy gravelly clay. Gravel is subangular and subrounded fine to coarse quartz mudstone and ironstone. (GLACIAL TILL) *.. 1.50m bgl: Occasional pockets of sandy gravelly clay becoming absent*
	1.70 1.70	B HSV	110	2.20	82.39		(Compact) bluish dark grey gravelly SILT, gravel is angular to subrounded fine to coarse mudstone. (WHITBY MUDSTONE FORMATION)
	3.00 3.00	B HSV	110	3.10	81.49		End of Trial Pit at 3.10m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion.

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPG059

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472484E, 255319N	**Scale:** 1:25
			Ground Level:	77.84m OD	
Client:	Ashfield Land		**Date(s):**	25/08/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 0.20	D ES		0.27	77.57		Stiff dark brown slightly sandy slightly gravelly CLAY with occasional rootlets, gravel flint. (MADE GROUND)
	0.60 0.60	D HSV	114				Stiff greyish brown slightly sandy silty CLAY with rootlets and rare brick fragments. (MADE GROUND)
				0.80	77.04		Stiff grey CLAY with occasional rootlets. (WHITBY MUDSTONE FORMATION)
	1.50 1.60	HSV B	110				*.. 1.30-1.40m bgl: Pocket of brown gravelly SAND. Gravel is angular and subangular fine flint.* *.. At 1.4m bgl: Occasional pockets (0.3m diam) of brown gravelly sand, gravel is angular and subangular fine flint.*
	2.00	B		2.00 2.05	75.84 75.79		Weathered orange brown fossiliferous MUDSTONE, recovered as angular fine to coarse GRAVEL with a medium cobble content. (MARLSTONE FORMATION) End of Trial Pit at 2.05m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion.

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPG061

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.60m x 1.90m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473000E, 255081N	**Scale:** 1:25
			Ground Level:	80.46m OD	
Client:	Ashfield Land		**Date(s):**	15/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.15	ES					Firm very sandy dark brown CLAY with rootlets. (TOPSOIL)
				0.25	80.21		
				0.40	80.06		Stiff brown sandy CLAY. (WHITBY MUDSTONE FORMATION)
							Stiff greyish brown CLAY. (WHITBY MUDSTONE FORMATION)
	1.00	HSV	136	1.00	79.46		Stiff grey CLAY. (WHITBY MUDSTONE FORMATION)
				1.90	78.56		
	2.00	B		2.00	78.46		Brown and grey clayey very sandy GRAVEL sized fragments of fine to coarse angular to subangular mudstone and limestone. (MARLSTONE FORMATION)
				2.10	78.36		Grey LIMESTONE recovered as angular fine to coarse gravel with a high cobble content. (MARLSTONE FORMATION)
							End of Trial Pit at 2.10m

1.0
2.0
3.0
4.0
5.0

Remarks: Infiltration test carried out in pit. Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPG062

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472341E, 255473N	**Scale:** 1:25
			Ground Level:	85.34m OD	
Client:	Ashfield Land		**Date(s):**	25/08/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 0.20	D ES		0.30	85.04		Stiff dark brown sandy gravelly CLAY with a low cobble content of flint and sandstone. Gravel is angular to subrounded fine to coarse flint, sandstone and rare brick fragments. (MADE GROUND)
	0.50 0.50	D HSV	74	0.85	84.49		Stiff light brown mottled light grey slightly sandy slightly gravelly CLAY. Gravel is angular and subangular fine to coarse of flint. (GLACIAL TILL)
	1.00 1.00	B HSV	87				Stiff grey mottled brown slightly sandy CLAY with some pockets of firm orange brown sandy gravelly clay, gravel is subangular and subrounded fine to coarse quartz mudstone and ironstone. (GLACIAL TILL)
	2.00	HSV	104				
	2.95	B		2.90 3.00	82.44 82.34		Stiff bluish dark grey CLAY. (WHITBY MUDSTONE FORMATION)
							End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion.

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPG063

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472526E, 255427N	**Scale:** 1:25
			Ground Level:	78.34m OD	
Client:	Ashfield Land		**Date(s):**	25/08/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.15 0.15	D ES		0.30	78.04		Stiff dark brown slightly silty sandy CLAY with occasional rootlets. (TOPSOIL)
	0.80	B					Stiff light brown sandy CLAY. (WHITBY MUDSTONE FORMATION)
	1.30 1.30	D HSV	95	1.20	77.14		Stiff grey mottled brown CLAY with occasional pockets of stiff brown sandy clay. (WHITBY MUDSTONE FORMATION)
	2.50 2.60	HSV B	68				*.. At 2.5m bgl: becoming firm with occasional fossilised wood fragments.*
				2.75	75.59		Weathered orange brown and grey fossiliferous MUDSTONE, recovered angular fine to coarse gravel with occasional cobbles. (MARLSTONE FORMATION)
				2.90	75.44		End of Trial Pit at 2.90m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion.

Stability: Stable

Groundwater: Small seepage in base of pit upon completion.

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPG065

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.60m x 1.50m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472928E, 255352N	**Scale:** 1:25
			Ground Level:	79.27m OD	
Client:	Ashfield Land		**Date(s):**	15/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.15	ES		0.30	78.97		Dark brown clayey fine to medium SAND with rootlets. (TOPSOIL)
	1.20	B		1.50	77.77		Brown clayey slightly gravelly SAND. Gravel is fine to coarse, subrounded to rounded of flint. (GLACIOFLUVIAL DEPOSITS)
				1.80	77.47		Firm brown mottled light grey very sandy CLAY. (WHITBY MUDSTONE FORMATION)
							End of Trial Pit at 1.80m

1.0
2.0
3.0
4.0
5.0

Remarks: Infiltration test carried out in pit. Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPG066 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.60m x 2.00m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473933E, 255104N	**Scale:** 1:25
			Ground Level:	82.80m OD	
Client:	Ashfield Land		**Date(s):**	20/02/17	**Plant Used:** JCB3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.20	82.60		Soft brown silty gravelly CLAY. Occasional gravel is angular to subangular, fine to medium of mixed lithologies. (MADE GROUND)
	0.50 0.50 0.50 - 1.00	D ES B					Orangish brown clayey SAND AND GRAVEL. Sand is fine to coarse, gravel is angular to subrounded of mixed lithologies with occasional brick, concrete and timber. (MADE GROUND)
	1.00 - 1.60	B		1.00	81.80		Firm grey sandy gravelly CLAY. Sand is fine to coarse, occasional gravel is angular to subangular of brick and concrete. Occasional angular cobbles of brick and concrete. (MADE GROUND)
	1.60 1.60	D ES		1.60	81.20		Greyish brown slightly clayey fine SAND. (GLACIOFLUVIAL DEPOSITS)
	2.50	ES					
				3.00	79.80		End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks:

Stability: Collapse side A

Groundwater: GW at 1.00m

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AD **Checked:** RB

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Trial Pit

Trial Pit No: TPG067

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.60m x 2.00m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474021E, 255116N	**Scale:** 1:25
			Ground Level:	83.70m OD	
Client:	Ashfield Land		**Date(s):**	20/02/17	**Plant Used:** JCB3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.20	83.50		Soft brown sandy gravelly CLAY. Sand is fine to coarse, occasional gravel is angular to subangular, fine to medium of mixed lithologies including brick and concrete. (MADE GROUND)
	1.00 - 1.50	B					Brown clayey SAND AND GRAVEL. Sand is fine to coarse, occasional gravel is angular to subangular of brick and concrete with frequent angular cobbles of brick and concrfete and frequent boulders of reinforced concrete. (MADE GROUND)
	1.50	D					
				1.80	81.90		Dark Brown SAND AND GRAVEL. Sand is fine to coarse, gravel is anuglar to subangular of brick and concrete with frequent angular cobbles and boulders of reinforced concrete and electonic waste material. (MADE GROUND)
				2.00	81.70		End of Trial Pit at 2.00m

1.0
2.0
3.0
4.0
5.0

Remarks: Pit unstable on all sides completed at 2m.

Stability: Collapse Side A, B and C unstable at 2m

Groundwater: Dry

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AD **Checked:** RB

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Trial Pit

Trial Pit No: TPG068

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.60m x 2.00m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473969E, 255360N	**Scale:** 1:25
			Ground Level:	86.50m OD	
Client:	Ashfield Land		**Date(s):**	20/02/17	**Plant Used:** JCB3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.20	86.30		Soft brown silty gravelly CLAY. Occasional gravel is angular to subangular, fine to medium of mixed lithologies. (MADE GROUND)
				0.40	86.10		Boulders of concrete. (MADE GROUND)
	0.50 0.50 0.50 - 1.00	D ES B					Soft to firm bluish grey sandy gravelly CLAY. Sand is fine to coarse, frequent gravel is angular to subrounded fine to coarse of brick, concrete and tile. Occasional angular to subangular cobbles and boulders of concrete. (MADE GROUND)
	1.00 1.00 1.00 - 1.50	D ES B		1.00	85.50		Black SAND AND GRAVEL. Sand is fine to coarse, gravel is angular fine to coarse of ash, coal, clinker and brick. (MADE GROUND)
				1.50	85.00		Orangish brown clayey SAND AND GRAVEL. Sand is fine to coarse, gravel is angular to rounded of mixed lithologies with frequent brick, concrete and tarmac. (MADE GROUND)
	2.00 2.00 2.00 - 2.50	D ES B					
				2.70 2.71	83.80 83.79		Obstruction at 2.70m 1.5m slab of tarmac unable to break through. (MADE GROUND) End of Trial Pit at 2.70m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Stable

Groundwater: GW at 1.00m

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AD **Checked:** RB

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Trial Pit

Trial Pit No: TPL001 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472503E, 255476N	**Scale:** 1:25
			Ground Level:	79.32m OD	
Client:	Ashfield Land		**Date(s):**	24/08/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.15 0.15	D ES		0.25	79.07		Firm dark brown sandy CLAY with rootlets. (TOPSOIL)
	0.50	D					Firm brown sandy CLAY. (WHITBY MUDSTONE FORMATION)
				0.90	78.42		Firm grey mottled brown CLAY. (WHITBY MUDSTONE FORMATION) *.. 1.10-1.30m bgl: Pocket (0.40m x 0.50m) of soft brown very sandy clay.*
	1.40	B					
				1.80	77.52		Stiff laminated dark grey CLAY with occasional relic rootlets and gypsum crystals. (WHITBY MUDSTONE FORMATION) *.. 2.60m bgl: Clay is composed of dark grey and brown mudstone litorelicts , recovered as clayey angular fine to coarse mudstone gravel with a high cobble content.*
	2.80	B					
				3.00	76.32		End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion.

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPL002

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472594E, 255458N	**Scale:** 1:25
			Ground Level:	77.67m OD	
Client:	Ashfield Land		**Date(s):**	24/08/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	D					Stiff dark brown CLAY with occasional rootlets. (TOPSOIL)
	0.20	ES		0.30	77.37		
	0.70	B					Stiff brown gravelly CLAY with rootlets. Gravel is subangular and subrounded fine to coarse ironstone and mudstone. (WHITBY MUDSTONE FORMATION)
	1.20	D		1.00	76.67		Stiff laminated grey CLAY with occasional gypsum crystals. (WHITBY MUDSTONE FORMATION)
	1.40	HSV	116				
	2.80	B					
				3.05	74.62		End of Trial Pit at 3.05m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion.

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPL003

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472675E, 255398N	**Scale:** 1:25
			Ground Level:	75.54m OD	
Client:	Ashfield Land		**Date(s):**	06/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30	ES		0.35	75.19		Stiff dark brown sandy CLAY with rootlets. (MADE GROUND)
	0.60	D					Stiff brown and greyish brown slightly sandy slightly gravelly CLAY with rootlets. Gravel is fine to coarse angular to subrounded of flint occasionally brick fragments and ash. (MADE GROUND)
	1.00	HSV	81	0.90	74.64		Stiff grey mottled light brown sandy CLAY. (MARLSTONE FORMATION)
	1.45 1.45	B HSV	52				*.. 1.45-1.60m bgl: Band of very clayey sandy fine to coarse angular to subangular GRAVEL with a medium cobble content of limestone.*
				2.20	73.34		Stiff dark grey CLAY. (DYRHAM FORMATION)
	2.70 2.70	B HSV	121				*.. 2.70-2.90m bgl: Becoming a very weak weathered mudstone recovered as a very gravelly CLAY with a medium cobble content. Gravel is angular and medium to coarse.*
				2.90	72.64		End of Trial Pit at 2.90m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPL004

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472545E, 255552N	**Scale:** 1:25
			Ground Level:	80.97m OD	
Client:	Ashfield Land		**Date(s):**	25/08/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.25	ES		0.30	80.67		Stiff dark brown sandy CLAY with rootlets. (TOPSOIL)
	0.60 0.60	B HSV	84				Stiff light brown sandy CLAY with rootlets. (WHITBY MUDSTONE FORMATION)
				1.10	79.87		
	1.40 1.40	D HSV	110				Stiff grey mottled brown CLAY. (WHITBY MUDSTONE FORMATION)
							.. 2.20m bgl: Laminated and bluish grey.
	2.70	B					
				3.00	77.97		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion.

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPL005

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472682E, 255520N	**Scale:** 1:25
			Ground Level:	78.59m OD	
Client:	Ashfield Land		**Date(s):**	06/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.15	ES		0.25	78.34		Firm dark brown sandy CLAY with rootlets. (TOPSOIL)
	0.50	D		0.65	77.94		Stiff light brown very sandy CLAY. (WHITBY MUDSTONE FORMATION)
	0.85	HSV	108				Stiff light grey mottled light brown CLAY with occasional sandy pockets. (WHITBY MUDSTONE FORMATION)
	1.30	B		1.45	77.14		
	1.70	HSV	104	1.70	76.89		Band of weak weathered dark grey LIMESTONE recovered as a sandy fine to coarse angular gravel with a high cobble content. (MARLSTONE FORMATION)
							Stiff bluish dark grey CLAY. (DYRHAM FORMATION)
							.. 2.00-2.90m bgl: Relict rootlets and gypsum crystals present.
	2.50	B					
				2.90	75.69		Band of weak weathered MUDSTONE recovered as angular fine to coarse gravel. (DYRHAM FORMATION)
				3.00	75.59		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPL006

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472790E, 255498N	**Scale:** 1:25
			Ground Level:	77.14m OD	
Client:	Ashfield Land		**Date(s):**	07/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.25	ES		0.30	76.84		Dark brown very clayey fine to coarse SAND with rootlets. (TOPSOIL)
	0.75	D					Brown very clayey fine to coarse SAND with rootlets. (GLACIOFLUVIAL DEPOSITS)
	0.75	HSV	98				*.. 0.60m bgl: Stiff light brown mottled light grey CLAY.*
	1.20	B		1.00	76.14		Stiff light brown mottled light grey CLAY. (DYRHAM FORMATION)
	1.20	HSV	110				
	1.60	HSV	94				
				1.80	75.34		(Compact) laminated grey light brown, orange brown SILT (DYRHAM FORMATION)
	2.20	B					
	2.20	HSV	84				
	2.70	B		2.60	74.54		Grey and orange brown MUDSTONE recovered as a slightly clayey sandy gravel with a high cobble content. (DYRHAM FORMATION)
				3.00	74.14		End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPL007

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472613E, 255578N	**Scale:** 1:25
			Ground Level:	81.44m OD	
Client:	Ashfield Land		**Date(s):**	06/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.30	81.14		Dark brown clayey fine to coarse SAND with rootlets and pockets of sandy CLAY. (MADE GROUND)
	0.50	ES					Brown clayey gravelly fine to coarse SAND with a medium cobble and boulder content and pockets of sandy clay. Gravel, cobbles and boulders are fine to coarse angular to subrounded of brick, concrete, glass, flint and ash. (MADE GROUND)
							.. 1.20-1.40m bgl: Band of orangish brown very sandy CLAY.
				1.40	80.04		Stiff light grey mottled light brown CLAY. (WHITBY MUDSTONE FORMATION)
	1.60	B					
	1.60	HSV	78	1.70	79.74		Stiff dark bluish grey CLAY with relict rootlets. (WHITBY MUDSTONE FORMATION)
	2.80	B					*.. 2.80-3.00m bgl: Becoming thickly laminated.*
				3.00	78.44		End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Unstable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPL008

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472710E, 255580N	**Scale:** 1:25
			Ground Level:	81.47m OD	
Client:	Ashfield Land		**Date(s):**	06/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.20	81.27		Dark brown slightly clayey fine to medium SAND with rootlets. (MADE GROUND)
				0.50	80.97		Brown gravelly fine to coarse SAND with pockets of clay and a low cobble content. Gravel and cobbles are fine to coarse angular to subrounded of brick, mudstone, flint, concrete, sandstone and ironstone. (MADE GROUND)
	0.70	ES					Stiff grey-brown very gravelly CLAY. Gravel is fine to coarse angular to rounded of flint, brick, concrete, cement and ironstone. (MADE GROUND)
				1.30	80.17		Soft to firm light grey gravelly slightly sandy CLAY with a medium cobble content. Gravel is fine to coarse angular to rounded of chalk, wood, wire, brick, metal, plastic, ash, flint, clay pipe and occasional slag. (MADE GROUND)
							.. 1.90-2.10m bgl: Band of brown clayey SAND.
	2.50 2.50	B HSV	55				
				2.80	78.67		End of Trial Pit at 2.80m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPL009

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472833E, 255527N	**Scale:** 1:25
			Ground Level:	76.67m OD	
Client:	Ashfield Land		**Date(s):**	06/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.25	ES		0.30	76.37		Dark brown clayey slightly gravelly fine to medium SAND with rootlets. Gravel is fine to coarse subangular to subrounded of flint. (TOPSOIL)
	0.55	B					orange brown clayey slightly gravelly fine to medium SAND. Gravel is fine to coarse subangular to subrounded of flint. (GLACIOFLUVIAL DEPOSITS)
							.. 0.60-0.85m bgl: Pockets of sandy CLAY.
				0.85	75.82		Stiff light grey mottled yellowish brown CLAY. (DYRHAM FORMATION)
	1.20	D					
	1.20	HSV	133				
							.. 1.80-2.60m bgl: Laminated grey and gravelly. Gravel is fine to coarse angular weak mudstone.
	2.30	B					
				2.60	74.07		Grey weathered brown MUDSTONE recovered as angular fine to coarse gravel with a high cobble content. (DYRHAM FORMATION)
				2.75	73.92		End of Trial Pit at 2.75m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPL010

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472688E, 255663N	**Scale:** 1:25
			Ground Level:	83.82m OD	
Client:	Ashfield Land		**Date(s):**	07/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.15	ES					Dark brown very clayey fine SAND with rootlets. (MADE GROUND)
				0.30	83.52		
	0.50	B					Brown gravelly fine to coarse SAND with a medium cobble content. Gravel and cobbles are fine to coarse angular weak sandstone. (MADE GROUND)
				0.70	83.12		
	1.40	B					Stiff light greyish light brown gravelly CLAY. Gravel is fine to coarse subangular to subrounded of chalk, flint, occasional metal and rare brick fragments. (MADE GROUND)
				2.40	81.42		
	2.70	ES					Firm greenish grey gravelly CLAY with a medium cobble content. Gravel and cobbles are fine to coarse angular to subrounded of wood, brick, concrete, ceramics, flint and ash. (MADE GROUND)
							.. 2.70m bgl: Odour (creosote).
				2.90	80.92		End of Trial Pit at 2.90m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPL011

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472753E, 255651N	**Scale:** 1:25
			Ground Level:	81.73m OD	
Client:	Ashfield Land		**Date(s):**	07/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.35	81.38		Dark brown clayey fine to coarse SAND with rootlets. (MADE GROUND)
	0.80	ES					Stiff brown very sandy gravelly CLAY with a medium cobble content. Gravel and cobbles are fine to coarse angular to subrounded of brick, concrete, ash, clinker, plastic, limestone, asphalt. (MADE GROUND)
	1.10	B					
				1.30	80.43		Firm grey mottled brown organic CLAY with occasionally brick, timber and metal. (MADE GROUND)
	2.70	B					
	2.70	HSV	74				*.. locally stiff at 2.70m.*
				3.00	78.73		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPR001

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474117E, 254948N	**Scale:** 1:25
			Ground Level:	86.39m OD	
Client:	Ashfield Land		**Date(s):**	12/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.10	ES		0.20	86.19		Stiff dark brown very sandy CLAY with rootlets. (TOPSOIL)
							Stiff yellowish brown sandy gravelly CLAY with rootlets. Gravel is fine to coarse subangular to rounded of quartz and flint. (GLACIOFLUVIAL DEPOSITS)
							.. 0.65m bgl: Mottled grey and only slightly sandy.
	1.10 1.10	B HSV	102	1.05	85.34		Stiff grey mottled brown CLAY with occasional sandy pockets. (WHITBY MUDSTONE FORMATION)
							.. 2.60m bgl: Becoming fissile and predominantly dark grey. No sandy pockets.
	2.80 2.80	B HSV	97				*.. 2.80m bgl: Gypsum crystals present.*
				3.00	83.39		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPR002

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474181E, 254685N	**Scale:** 1:25
			Ground Level:	92.92m OD	
Client:	Ashfield Land		**Date(s):**	26/08/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.15	ES					Stiff dark brown slightly sandy gravelly CLAY with rootlets. (TOPSOIL)
				0.30	92.62		
							Stiff brown gravelly CLAY. Gravel is fine to coarse subangular to subrounded of quartz and flint. (GLACIAL TILL)
				0.60	92.32		
	0.80	B					Firm dark grey CLAY. (WHITBY MUDSTONE FORMATION)
	2.50	D					
	2.50	HSV	110				.. 2.50m bgl: Becoming stiff.
	3.00	B		3.00	89.92		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion.

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPR003

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474247E, 254454N	**Scale:** 1:25
			Ground Level:	92.37m OD	
Client:	Ashfield Land		**Date(s):**	26/08/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES		0.30	92.07		Stiff dark brown sandy CLAY with rootlets. (TOPSOIL)
	0.60	D					Stiff brown slightly sandy gravelly CLAY. Gravel is fine to coarse subangular to subrounded of quartz, flint, sandstone and chalk. (GLACIAL TILL)
	1.10	B		1.00	91.37		Stiff grey occasionally brown CLAY. (WHITBY MUDSTONE FORMATION)
	1.10	HSV	88				
	2.10	HSV	104				
	2.60	HSV	114				
	2.90	B					
	2.90	HSV	117	3.00	89.37		End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion.

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPR004

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474313E, 254222N	**Scale:** 1:25
			Ground Level:	94.81m OD	
Client:	Ashfield Land		**Date(s):**	30/08/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 - 0.30	ES		0.30	94.51		Firm dark brown slightly gravelly CLAY. Gravel is rounded fine to coarse of quartz. (TOPSOIL)
	1.60	B					Firm greyish brown slightly gravelly CLAY. Gravel is rounded fine to coarse of quartz and siltstone with occasional cobble size fragments of limestone. (GLACIAL TILL)
	2.50	B					
				3.00	91.81		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AO **Checked:** RB

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Trial Pit

Trial Pit No: TPR005 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.60m x 2.00m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474376E, 253947N	**Scale:** 1:25
			Ground Level:	96.70m OD	
Client:	Ashfield Land		**Date(s):**	19/04/17	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.25	ES					Firm brown slightly gravelly CLAY with rootlets. Gravel is subangular to subrounded fine to coarse of flint and quartzite. (TOPSOIL)
				0.25	96.45		
							Firm brown mottled grey CLAY with occasional rootlets and gravel of subrounded fine to medium of flint and quartzite. (GLACIAL TILL)
	0.80	HSV	61				
				1.10	95.60		
							Stiff dark grey CLAY with occasional subangular fine to medium selenite crystals. (WHITBY MUDSTONE FORMATION)
	1.60	HSV	90				*From 1.50m bgl: With silt size selenite crystals.*
							From 1.80m bgl: Becoming slightly sandy with pockets of fine and medium orange sand.
							From 2.00m bgl: With occasional relict rootlets and silt sized reflective crystals.
	2.20	HSV	65				
	2.50 - 3.00	D		2.50	94.20		Stiff dark grey mottled orange slightly sandy fissured CLAY with occasional angular fine to medium selenite crystals. (WHITBY MUDSTONE FORMATION)
	2.70	HSV	82				
				3.00	93.70		End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks: 1)Backfilled with lightly compacted arisings.

Stability: Stable

Groundwater: No groundwater encountered.

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AA **Checked:** RB

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Trial Pit

Trial Pit No: TPR006

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.60m x 2.00m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474466E, 253603N	**Scale:** 1:25
			Ground Level:	94.80m OD	
Client:	Ashfield Land		**Date(s):**	20/04/17	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.30	ES		0.30	94.50		Firm brown slightly gravelly sandy silty CLAY with rootlets. Gravel is subangular to subrounded fine to medium of flint. (TOPSOIL)
				0.60	94.20		Firm orangish brown slightly gravelly sandy CLAY. Gravel is angular to subangular fine to coarse of flint, mudstone and limestone. (WHITBY MUDSTONE FORMATION)
	0.80	HSV	64				Stiff orange and black mottled grey slightly silty CLAY. (WHITBY MUDSTONE FORMATION)
	2.00	HSV	69				
	2.30	HSV	89				
	2.90	HSV	92				
				3.00	91.80		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks: 1)Backfilled with lightly compacted arisings.

Stability: Stable

Groundwater: No groundwater encountered.

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AA **Checked:** RB

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Trial Pit

Trial Pit No: TPR007

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.60m x 2.00m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474410E, 253616N	**Scale:** 1:25
			Ground Level:	96.75m OD	
Client:	Ashfield Land		**Date(s):**	20/04/17	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.30	ES					Firm brown slightly gravelly slightly sandy silty CLAY with rootlets, rare brick fragments and occasional ceramic tile fragments. Gravel is angular to subrounded fine to medium of flint. (TOPSOIL)
				0.30	96.45		Firm orange slightly gravelly sandy CLAY with rare fine coal fragments. Gravel is angular to subrounded fine to coarse of flint. (WHITBY MUDSTONE FORMATION)
	0.80	HSV	69	0.80	95.95		Firm to stiff grey CLAY with pockets of orange silt and medium sand. (WHITBY MUDSTONE FORMATION)
				1.60	95.15		Stiff dark grey CLAY with occasional relict rootlets and silt size selenite crystals. (WHITBY MUDSTONE FORMATION)
	1.70	HSV	85				
	2.50 - 3.00	D		2.50	94.25		Stiff dark grey slightly gravelly CLAY. Gravel is angular to subangular fine to coarse of limestone. (WHITBY MUDSTONE FORMATION)
	2.60	HSV	91				
				3.00	93.75		End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks: 1)Backfilled with lightly compacted arisings.

Stability: Stable

Groundwater: No groundwater encountered.

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AA **Checked:** RB

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Trial Pit

Trial Pit No: TPR008

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473973E, 253722N	**Scale:** 1:25
			Ground Level:	96.94m OD	
Client:	Ashfield Land		**Date(s):**	31/08/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 - 0.30	ES		0.30	96.64		Firm dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL)
	1.00	ES					Firm light brown CLAY. (WHITBY MUDSTONE FORMATION)
	1.20	HSV	100	1.20	95.74		Stiff to very stiff bluish grey mottled brown CLAY with localised pockets (approx 100mm diam) of fine sand and abundant root fossils. (WHITBY MUDSTONE FORMATION)
▼	1.80	B		1.80	95.14		Stiff to very stiff thinly bedded dark grey CLAY with abundant root fossils becoming less abundant with depth. (WHITBY MUDSTONE FORMATION)
	2.00	HSV	130				
	2.80	B					
	3.00	HSV	130	3.00	93.94		End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks:

Stability: Pit remained stable

Groundwater: Seepage encountered at 1.8m.

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AO **Checked:** RB

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Trial Pit

Trial Pit No: TPR009 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473813E, 253813N	**Scale:** 1:25
			Ground Level:	95.60m OD	
Client:	Ashfield Land		**Date(s):**	01/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 - 0.30	ES		0.30	95.30		Firm dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL)
				0.80	94.80		Firm reddish brown CLAY. (WHITBY MUDSTONE FORMATION)
	1.00	ES					Stiff bluish grey mottled brown CLAY with occasional root fossils decreasing with depth and occasional sand grade gypsum crystals. (WHITBY MUDSTONE FORMATION)
	1.50	B					*.. At 1.5m bgl: 100mm pocket of sand encountered.*
	2.00	HSV	85				
	2.80	B					
	3.00	HSV	105	3.00	92.60		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AO **Checked:** RB

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Trial Pit

Trial Pit No: TPR010 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473771E, 253933N	**Scale:** 1:25
			Ground Level:	93.93m OD	
Client:	Ashfield Land		**Date(s):**	01/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 - 0.30	ES					Firm dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL)
				0.30	93.63		Firm reddish brown CLAY. (WHITBY MUDSTONE FORMATION)
				0.60	93.33		Stiff bluish grey mottled brown CLAY with occasional root fossils. (WHITBY MUDSTONE FORMATION)
	1.00 1.00	ES HSV	110				
							.. At 1.3-1.4m bgl: With occasional sand pockets.
				1.50	92.43		Stiff dark grey mottled brown CLAY with occasional sand grade gypsum crystals and rounded fine to coarse flint gravel. (WHITBY MUDSTONE FORMATION)
	2.00 2.00	B HSV	120				
	2.80 2.80	B HSV	110				
				3.00	90.93		End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AO **Checked:** RB

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Trial Pit

Trial Pit No: TPR011 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473869E, 254158N	**Scale:** 1:25
			Ground Level:	90.33m OD	
Client:	Ashfield Land		**Date(s):**	01/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 - 0.30	ES		0.30	90.03		Firm dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL)
							Firm reddish brown CLAY. (WHITBY MUDSTONE FORMATION)
	1.00	ES		0.90	89.43		
	1.00	HSV	110				Stiff bluish grey mottled brown CLAY with occasional sand grade gypsum crystals and root fossils. (WHITBY MUDSTONE FORMATION)
	2.00	HSV	101				
	3.00	HSV	100	3.00	87.33		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AO **Checked:** RB

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Trial Pit

Trial Pit No: TPR012

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.80m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473933E, 254336N	**Scale:** 1:25
			Ground Level:	86.20m OD	
Client:	Ashfield Land		**Date(s):**	29/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES		0.25	85.95		Firm brown slightly gravelly CLAY with frequent rootlets. Gravel is subangular and subrounded fine to coarse of ferrouginous siltstone and limestone. (TOPSOIL)
	0.50 - 0.60	B					Stiff orange brown and light brown slightly gravelly CLAY with occasional rootlets. Gravel is subangular and subrounded fine to coarse ferruginous siltstone and mudstone. (WHITBY MUDSTONE FORMATION)
				1.20	85.00		Stiff bluish grey locally orange brown and bluish grey slightly gravelly CLAY with occasional silt grade gypsum crystals. Gravel is subangular and subrounded fine to coarse mudstone and ferruginous siltstone. (WHITBY MUDSTONE FORMATION)
							.. At 2.1m bgl: Gypsum crystals becoming frequent.
				2.40	83.80		End of Trial Pit at 2.40m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: MOB **Checked:** RB

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Trial Pit

Trial Pit No: TPR013

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474025E, 254507N	**Scale:** 1:25
			Ground Level:	88.15m OD	
Client:	Ashfield Land		**Date(s):**	26/08/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.10	ES		0.30	87.85		Stiff dark brown sandy slightly gravelly CLAY with rootlets. Gravel is fine to coarse angular to subrounded of flint. (TOPSOIL)
	0.80	HSV	117				Stiff dark grey occasionally mottled brown CLAY with rootlets. (WHITBY MUDSTONE FORMATION)
	1.00	B					
	2.10	HSV	84				
	2.70	B					.. 2.60m bgl: Becoming slightly gravelly. Gravel is fine to coarse, angular to subangular of mudstone and ironstone.
	2.70	HSV	117				
				3.00	85.15		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion.

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPR014 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:** **Ground Level:**	474028E, 254086N 89.47m OD	**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	26/08/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.15	ES					Stiff dark brown slightly sandy CLAY with rootlets. (TOPSOIL)
				0.30	89.17		
	0.40	HSV	104				Stiff brown slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of flint. (WHITBY MUDSTONE FORMATION)
	0.70	B					*.. 0.60-0.80m bgl: Mottled grey and no gravel present.*
				0.80	88.67		
	0.90	D					Stiff grey mottled brown CLAY. (WHITBY MUDSTONE FORMATION)
	0.90	HSV	114				
							.. 1.40m bgl: Occasional sandy pockets.
	2.00	HSV	98				
				2.50	86.97		Stiff laminated bluish grey CLAY with relict rootlets. (WHITBY MUDSTONE FORMATION)
	2.60	B					
				2.95	86.52		End of Trial Pit at 2.95m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion.

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPR015

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474122E, 254265N	**Scale:** 1:25
			Ground Level:	88.41m OD	
Client:	Ashfield Land		**Date(s):**	30/08/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 - 0.30	ES		0.30	88.11		Firm dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL)
							Very stiff grey mottled brown CLAY. (WHITBY MUDSTONE FORMATION)
	1.00	HSV	130	0.90	87.51		Very stiff bluish grey mottled brown silty CLAY with frequent relict rootlets (<1mm) and shell fragments. (WHITBY MUDSTONE FORMATION)
	1.40	B					
	2.00	HSV	99	1.80	86.61		Stiff dark bluish grey mottled reddish brown CLAY with occasional subangular fragments of fine to coarse gravel sized siltstone and mudstone. (WHITBY MUDSTONE FORMATION)
				3.00	85.41		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AO **Checked:** RB

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Trial Pit

Trial Pit No: TPRT001

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472953E, 254750N	**Scale:** 1:25
			Ground Level:	79.65m OD	
Client:	Ashfield Land		**Date(s):**	24/08/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.25	D		0.30	79.35		Stiff dark brown slightly silty sandy CLAY with rootlets. (TOPSOIL)
	0.25	ES					
	0.50	D					Stiff light brown mottled grey CLAY. (WHITBY MUDSTONE FORMATION)
	0.80	B		0.70	78.95		Stiff grey mottled brown slightly gravelly CLAY with occasional rootlets, gravel is subangular and subrounded fine to coarse of flint and ironstone. (WHITBY MUDSTONE FORMATION)
	1.80	HSV	95				
	2.00	HSV	134				*.. 2.00m bgl: Occasional bands of gypsum.*
	2.10	D					
	3.00	B		3.10	76.55		End of Trial Pit at 3.10m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion.

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPRT002

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472970E, 254704N	**Scale:** 1:25
			Ground Level:	80.33m OD	
Client:	Ashfield Land		**Date(s):**	24/08/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 0.20 0.25	D ES HSV	101	0.30	80.03		Stiff brown slightly silty sandy slightly gravelly CLAY with rootlets. Gravel is rounded coarse flint. (TOPSOIL)
				0.70	79.63		Stiff brown mottled grey CLAY. (WHITBY MUDSTONE FORMATION)
	0.90 0.90	B HSV	113				Stiff grey mottled brown slightly gravelly CLAY, gravel is subangular to subrounded fine to coarse ironstone. (WHITBY MUDSTONE FORMATION)
	2.10 2.10	D HSV	100				*.. 2.00m bgl: Gravel becoming absent.*
				2.30	78.03		Stiff blackish grey CLAY. (WHITBY MUDSTONE FORMATION)
	2.90	B					*.. 2.80m bgl: Becoming mudstone, recovered as clayey gravel with a high cobble content.*
				3.10	77.23		End of Trial Pit at 3.10m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion.

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPRT003

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472992E, 254749N	**Scale:** 1:25
			Ground Level:	79.59m OD	
Client:	Ashfield Land		**Date(s):**	24/08/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 0.20 0.30	D ES HSV	176	0.25	79.34		Stiff brown CLAY with occasional rootlets. (TOPSOIL)
	0.75	B					Stiff yellowish brown mottled light grey CLAY. (WHITBY MUDSTONE FORMATION)
	1.30 1.30	D HSV	52	1.10	78.49		Firm grey CLAY. (WHITBY MUDSTONE FORMATION)
	1.80	HSV	95				*.. 1.40m bgl: Becoming stiff.*
	2.90	B		3.00	76.59		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion.

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPRT004

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473000E, 254724N	**Scale:** 1:25
			Ground Level:	79.95m OD	
Client:	Ashfield Land		**Date(s):**	24/08/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.15 0.15	D ES		0.25	79.70		Stiff brown CLAY with rootlets. (TOPSOIL)
	0.50 0.50	B HSV	91				Stiff brown mottled grey CLAY. (WHITBY MUDSTONE FORMATION)
	1.10	D		0.80	79.15		Stiff grey mottled brown CLAY. (WHITBY MUDSTONE FORMATION)
							.. 1.50m bgl: Clay becoming laminated blueish grey mottled brown.
	2.00	HSV	87				
							.. 2.70m bgl: Bands of gypsum crystals.
	3.00	B					
				3.10	76.85		End of Trial Pit at 3.10m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion.

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPRT005 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473056E, 254726N	**Scale:** 1:25
			Ground Level:	80.00m OD	
Client:	Ashfield Land		**Date(s):**	12/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES		0.30	79.70		Stiff dark slightly sandy slightly gravelly CLAY with rootlets. Gravel is fine to coarse subangular to subrounded of flint. (TOPSOIL)
				0.80	79.20		Stiff light greyish brown slightly sandy CLAY with rootlets. (WHITBY MUDSTONE FORMATION)
	0.90	HSV	76				Stiff grey mottled light brown CLAY. (WHITBY MUDSTONE FORMATION)
	1.10	D					
	1.10	HSV	106				
				2.10	77.90		Stiff thickly laminated bluish grey CLAY composed of mudstone lithorelicts. (WHITBY MUDSTONE FORMATION)
	2.60	B					
				3.00	77.00		End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPRT006 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:** 473066E, 254690N **Ground Level:** 80.16m OD		**Scale:** 1:25
Client:	Ashfield Land		**Date(s):**	09/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES		0.20	79.96		Firm dark brown silty CLAY. (TOPSOIL)
	0.70 0.70	B HSV	60	0.70	79.46		Firm reddish brown mottled greenish grey silty CLAY. (WHITBY MUDSTONE FORMATION)
							Firm greenish grey mottled bluish grey with some mudstone fragments. (WHITBY MUDSTONE FORMATION)
							.. becoming stiff below approximately 1.20m.
	2.80	HSV	115	2.80	77.36		End of Trial Pit at 2.80m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Sides stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: FT **Checked:** RB

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Trial Pit

Trial Pit No: TPRT007

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473035E, 254675N	**Scale:** 1:25
			Ground Level:	80.46m OD	
Client:	Ashfield Land		**Date(s):**	12/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30	ES		0.35	80.11		Stiff dark brown slightly gravelly CLAY with rootlets. Gravel is fine to coarse subangular to subrounded of flint. (TOPSOIL)
	0.60	B					Stiff yellowish brown slightly sandy CLAY with rootlets. (WHITBY MUDSTONE FORMATION)
	0.60	HSV	105				*.. 0.65m bgl: Mottled grey.*
							.. 0.70-1.00m bgl: Becomes a very clayey SAND.
	1.10	HSV	93	0.95	79.51		Stiff grey mottled brown CLAY. (WHITBY MUDSTONE FORMATION)
	1.80	D		1.50	78.96		Stiff bluish grey CLAY. (WHITBY MUDSTONE FORMATION)
							.. 2.30-2.90m bgl: Clay is thickly laminated and composed of mudstone lithorelicts.
	2.70	B		2.90	77.56		End of Trial Pit at 2.90m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPRT008

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473029E, 254706N	**Scale:** 1:25
			Ground Level:	80.17m OD	
Client:	Ashfield Land		**Date(s):**	12/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES		0.25	79.92		Stiff dark brown slightly sandy slightly gravelly CLAY with rootlets. Gravel is fine to coarse angular to subrounded of brick chalk and flint. (MADE GROUND)
	0.70	D					Stiff light brown CLAY with rootlets. (WHITBY MUDSTONE FORMATION)
	0.70	HSV	110				
				1.00	79.17		Stiff dark grey mottled brown CLAY. (WHITBY MUDSTONE FORMATION)
	1.30	HSV	79				
	1.50	B					*.. 1.40m bgl: with occasional pockets of brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of ironstone.*
				2.20	77.97		Stiff bluish grey CLAY. (WHITBY MUDSTONE FORMATION)
	3.00	B					*.. 2.60m bgl: Clay is thickly laminated and is composed of mudstone lithorelicts.*
				3.20	76.97		End of Trial Pit at 3.20m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPT001 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472589E, 255397N	**Scale:** 1:25
			Ground Level:	76.82m OD	
Client:	Ashfield Land		**Date(s):**	25/08/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES		0.26	76.56		Stiff dark brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded of flint, coal, glass and ash. (TOPSOIL)
	0.70	D		0.85	75.97		Stiff brown slightly sandy CLAY with pockets of soft brown very sandy clay. (MARLSTONE FORMATION)
	1.10 1.10	B HSV	95	1.50	75.32		Stiff grey mottled light brown CLAY with large pockets of very clayey fine to medium SAND. (MARLSTONE FORMATION)
	2.50 2.50	B HSV	98	2.00	74.82		Weathered grey and orange brown MUDSTONE recovered as a sandy fine to coarse angular gravel with a high cobble content. (MARLSTONE FORMATION)
				3.00	73.82		Stiff bluish grey CLAY with relict rootlets. (DYRHAM FORMATION)
							End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion.

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPT002 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472633E, 255386N	**Scale:** 1:25
			Ground Level:	76.20m OD	
Client:	Ashfield Land		**Date(s):**	25/08/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30	ES		0.40	75.80		Stiff dark brown CLAY with rootlets. (TOPSOIL)
	0.70	D		1.10	75.10		Stiff brown slightly sandy CLAY with pockets of brown very sandy CLAY. (MARLSTONE FORMATION)
	1.40	B					Stiff grey mottled brown CLAY with bands/large pockets of very sandy clay and very clayey sand. (MARLSTONE FORMATION)
	1.40	HSV	116				
							.. 2.00m bgl: Becoming bluish grey.
				2.30	73.90		Band of grey weathered orange brown fossiliferous MUDSTONE. (MARLSTONE FORMATION)
				2.60	73.60		Stiff bluish grey CLAY with pockets of very sandy CLAY. (DYRHAM FORMATION)
	2.80	B		2.90	73.30		End of Trial Pit at 2.90m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion.

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPT004

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473000E, 255276N	**Scale:** 1:25
			Ground Level:	84.22m OD	
Client:	Ashfield Land		**Date(s):**	14/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30	ES		0.37	83.85		Dark brown clayey fine to medium SAND with rootlets. (TOPSOIL)
				0.60	83.62		Brown slightly clayey fine to medium SAND. (GLACIOFLUVIAL DEPOSITS)
	1.40	B					Greyish brown gravelly fine to coarse SAND. Gravel is fine to coarse angular to subangular of mudstone and ironstone. (GLACIOFLUVIAL DEPOSITS)
							.. 2.40m bgl: Becoming only slightly gravelly.
	2.60	B					*.. 2.70m bgl: Becoming damp and slightly clayey.*
				3.10	81.12		End of Trial Pit at 3.10m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPT005

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472777E, 254845N	**Scale:** 1:25
			Ground Level:	78.28m OD	
Client:	Ashfield Land		**Date(s):**	23/08/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.45	ES					Stiff greyish brown slightly sandy slightly gravelly CLAY with occasional cobbles grade brick fragments. Gravel is angular to rounded fine to coarse of quartz, flint brick and ash. (MADE GROUND)
	0.45 - 1.10	ES		0.40	77.88		Stiff brownish grey CLAY with occasional rootlets. (ALLUVIUM)
				1.10	77.18		End of Trial Pit at 1.10m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: RB **Checked:** RB

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Trial Pit

Trial Pit No: TPT006 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	472758E, 254853N	**Scale:** 1:25
			Ground Level:	77.98m OD	
Client:	Ashfield Land		**Date(s):**	23/08/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.15	ES		0.15	77.83		Greyish brown sandy gravelly CLAY with frequent cobbles and rootlets and occasional fragments of plastic, wood, textile, metal and glass. Gravel is subangular to rounded fine to coarse of quartz. (MADE GROUND)
							Stiff yellowish brown CLAY with occasional roots and rootlets. (ALLUVIUM)
	1.10 - 1.50	ES		1.10	76.88		Stiff yellowish brown and grey slightly sandy slightly gravelly CLAY. Gravel is subangular to rounded fine to coarse quartz. (ALLUVIUM)
							.. At 1.1m bgl: Land drain encountered.
				1.50	76.48		End of Trial Pit at 1.50m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: RB **Checked:** RB

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Trial Pit

Trial Pit No: TPT007

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474017E, 253900N	**Scale:** 1:25
			Ground Level:	92.99m OD	
Client:	Ashfield Land		**Date(s):**	31/08/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 - 0.30	ES		0.30	92.69		Firm dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL)
							Firm brown slightly gravelly CLAY. Gravel is rounded fine to coarse of quartz. (WHITBY MUDSTONE FORMATION)
				1.30	91.69		Firm bluish grey mottled brown CLAY with thin beds of sand grade gypsum crystals. (WHITBY MUDSTONE FORMATION)
	2.00	HSV	105				
	2.50	B					
	3.00	HSV	113	3.00	89.99		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AO **Checked:** RB

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Trial Pit

Trial Pit No: TPT008

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474162E, 253910N	**Scale:** 1:25
			Ground Level:	91.78m OD	
Client:	Ashfield Land		**Date(s):**	30/08/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 - 0.30	ES		0.30	91.48		Firm dark brown slightly sandy CLAY with frequent rootlets.. (TOPSOIL)
				0.90	90.88		Firm light brown sandy CLAY. (WHITBY MUDSTONE FORMATION)
	1.00	HSV	96				Stiff bluish grey mottled brown CLAY. (WHITBY MUDSTONE FORMATION)
	1.60 - 2.40	B		1.50	90.28		Very stiff bluish grey CLAY with thin beds of sand grade gypsum crystals and relict roots. (WHITBY MUDSTONE FORMATION)
	2.00	HSV	104				
	3.00	HSV	130	3.00	88.78		End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AO **Checked:** RB

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Trial Pit

Trial Pit No: TPT009

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473999E, 253874N	**Scale:** 1:25
			Ground Level:	94.80m OD	
Client:	Ashfield Land		**Date(s):**	31/08/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 - 0.30	ES		0.30	94.50		Firm dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL)
							Firm dark reddish brown mottled orange CLAY with occasional boulders and cobble grade fragments of limestone. (MADE GROUND)
				2.30	92.50		Firm bluish grey and brown CLAY. (WHITBY MUDSTONE FORMATION)
	2.80 2.80	B HSV	85				
				3.00	91.80		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AO **Checked:** RB

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Trial Pit

Trial Pit No: TPT010 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474103E, 253883N	**Scale:** 1:25
			Ground Level:	95.67m OD	
Client:	Ashfield Land		**Date(s):**	31/08/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 - 0.30	ES		0.30	95.37		Firm dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL)
	2.40 - 3.00	B		3.00	92.67		Firm dark brownish grey mottled brown slightly sandy CLAY with occasional cobble grade fragments of limestone. (MADE GROUND)
							End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AO **Checked:** RB

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Trial Pit

Trial Pit No: TPT011

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474235E, 253866N	**Scale:** 1:25
			Ground Level:	96.61m OD	
Client:	Ashfield Land		**Date(s):**	30/08/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 - 0.30	ES		0.30	96.31		Firm dark brown slightly sandy CLAY with frequent rootlets. Sand is fine to coarse. (TOPSOIL)
	2.80 - 3.00	B		3.00	93.61		Soft light brown to dark grey slightly sandy CLAY with occasional cobble grade fragments of limestone. (MADE GROUND)
							End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AO **Checked:** RB

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Trial Pit

Trial Pit No: TPT012 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.60m x 2.00m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474279E, 253884N	**Scale:** 1:25
			Ground Level:	93.00m OD	
Client:	Ashfield Land		**Date(s):**	19/04/17	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.40	ES					Soft to firm brown slightly gravelly sandy CLAY with rootlets, rare terracotta tile fragments and low cobble content. Gravel is subangular to rounded fine to coarse of flint and limestone. (MADE GROUND)
	0.40	HSV	57	0.40	92.60		Soft brown mottled multicoloured gravelly sandy CLAY with some boulders of limestone. Gravel is angular to subrounded of mudstone, limestone and flint. (MADE GROUND)
				0.80	92.20		Soft to firm grey mottled light brown CLAY with occasional gravel of angular to subrounded fine to coarse flint and limestone. (MADE GROUND)
				1.60	91.40		Firm grey CLAY with pockets of orange silt. (WHITBY MUDSTONE FORMATION)
	2.20 - 2.50 2.20	D HSV	73				*From 2.20m bgl: Reflective fine to medium sand size crystals noted.*
	2.50	HSV	90	2.50	90.50		Stiff dark grey mottled orange slightly sandy fissured CLAY with occasional angular fine to medium selenite crystals and occasional relict rootlets. (WHITBY MUDSTONE FORMATION)
				3.00	90.00		End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks: 1)Backfilled with lightly compacted arisings.

Stability: Stable

Groundwater: No groundwater encountered.

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AA **Checked:** RB

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Trial Pit

Trial Pit No: TPT013

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.60m x 2.00m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474391E, 253873N	**Scale:** 1:25
			Ground Level:	94.00m OD	
Client:	Ashfield Land		**Date(s):**	19/04/17	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.30	ES					Firm brown slightly gravelly sandy CLAY with rootlets. Gravel is subangular to subrounded fine to medium of flint. (TOPSOIL)
				0.30	93.70		Firm light brown sandy silty CLAY with rootlets and occasional gravel of subangular to subrounded fine to medium of flint. (WHITBY MUDSTONE FORMATION)
				1.20	92.80		
	1.30	HSV	64				Firm orangish brown mottled grey sandy silty CLAY with occasional gravel of subangular to rounded fine to medium flint and rare angular fine to medium coal fragments. (WHITBY MUDSTONE FORMATION)
				1.45	92.55		
	1.60	HSV	84				Stiff light grey CLAY with pockets of orange medium sand. (WHITBY MUDSTONE FORMATION)
				2.00	92.00		
	2.10	HSV	92				Stiff dark grey CLAY with occasional subangular to rounded fine to medium gravel of flint and mudstone, coarse sand to fine gravel size selenite crystals and occasional relict rootlets. (WHITBY MUDSTONE FORMATION)
	2.60	HSV	81				
				3.00	91.00		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks: 1)Backfilled with lightly compacted arisings.

Stability: Stable

Groundwater: No groundwater encountered.

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AA **Checked:** RB

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Trial Pit

Trial Pit No: TPT014

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.60m x 2.00m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474407E, 253833N	**Scale:** 1:25
			Ground Level:	95.50m OD	
Client:	Ashfield Land		**Date(s):**	19/04/17	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.25	ES					Firm to stiff brown slightly gravelly sandy CLAY with rootlets. Gravel is angular to subangular fine to coarse of concrete, terracotta tile fragments, mudstone, limestone, chert and flint. (MADE GROUND)
				0.25	95.25		Firm brown mottled light grey orange gravelly sandy CLAY with rootlets and medium cobble content. Gravel is angular to subrounded fine to coarse of sandstone, mudstone, limestone and cobble grade fragments of concrete slab ~500mm in diameter. (MADE GROUND)
	1.10	HSV	84	1.00	94.50		Soft to firm dark brown grey slightly gravelly sandy CLAY with pockets of reddish orange fine sand. Gravel is angular to subangular fine to coarse of terracotta tile fragments, mudstone, limestone and flint. (MADE GROUND)
	1.70	HSV	60				
	2.70 - 3.00	D		2.60	92.90		Soft dark grey mottled red gravelly CLAY with boulders and medium cobble content. Gravel is angular to subangular fine to coarse of ironstone, boulders and cobble grade fragments are of ironstone. (MADE GROUND)
				3.00	92.50		End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks: 1)Backfilled with lightly compacted arisings.

Stability: Stable

Groundwater: No groundwater encountered.

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AA **Checked:** RB

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Trial Pit

Trial Pit No: TPT015 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.60m x 2.00m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474430E, 253742N	**Scale:** 1:25
			Ground Level:	95.60m OD	
Client:	Ashfield Land		**Date(s):**	19/04/17	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.40	ES					Firm brown gravelly sandy CLAY with high cobble content. Gravel is angular to subangular fine to coarse of heterogenous, multicoloured composition of mudstone, limestone, ironstone, chert, concrete slab, sandstone and siltstone. (MADE GROUND)
				0.40	95.20		Firm light brown gravelly sandy CLAY with occasional boulders. Gravel is angular to subangular fine to coarse of mudstone, limestone, ironstone and a green fine sandstone/siltstone. (MADE GROUND)
							From 2.00m bgl: Becoming soft, alternating with firm.
				3.00	92.60		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks: 1)Backfilled with lightly compacted arisings.

Stability: Stable

Groundwater: No groundwater encountered.

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AA **Checked:** RB

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Trial Pit

Trial Pit No: TPT016

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.60m x 2.00m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474441E, 253705N	**Scale:** 1:25
			Ground Level:	92.75m OD	
Client:	Ashfield Land		**Date(s):**	20/04/17	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.40	ES					Firm brown gravelly sandy silty CLAY. Gravel is angular to rounded fine to coarse of flint, mudstone and limestone, with rare ceramic pipe and ironstone fragments. (MADE GROUND)
				0.40	92.35		Soft light brown gravelly sandy CLAY with low cobble content and rare fine to medium gravel size coal fragments. Gravel is angular to rounded fine to coarse of flint, limestone and ironstone. Cobble grade fragments are of limestone. (MADE GROUND)
	1.20	HSV	50				
				1.80	90.95		End of Trial Pit at 1.80m

1.0 2.0 3.0 4.0 5.0

Remarks: 1)Backfilled with lightly compacted arisings.

Stability: Stable

Groundwater: Groundwater encountered at 0.90m bgl.

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AA **Checked:** RB

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Trial Pit

Trial Pit No: TPT017

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.60m x 2.00m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474498E, 253653N	**Scale:** 1:25
			Ground Level:	95.65m OD	
Client:	Ashfield Land		**Date(s):**	20/04/17	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.40	ES					Firm brown slightly gravelly sandy CLAY with rootlets. Gravel is angular to subrounded fine to medium of mudstone, limestone and flint. (TOPSOIL)
				0.40	95.25		
	0.60	HSV	72				Firm dark orangish brown slightly gravelly sandy silty CLAY with low cobble content. Gravel is subangular to subrounded fine to medium of flint and mudstone. (WHITBY MUDSTONE FORMATION)
				1.00	94.65		
	1.20	HSV	85				Firm grey CLAY. (WHITBY MUDSTONE FORMATION)
	1.40 - 2.00	B		1.40	94.25		Orange mottled grey gravelly medium SAND. Gravel is angular to subrounded fine to medium of limestone. (WHITBY MUDSTONE FORMATION)
	2.00	HSV	75	2.00	93.65		Stiff dark grey CLAY. (WHITBY MUDSTONE FORMATION)
	2.60	HSV	100				
				3.00	92.65		End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks: 1)Backfilled with lightly compacted arisings.

Stability: Stable

Groundwater: No groundwater encountered.

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AA **Checked:** RB

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Trial Pit

Trial Pit No: TPT018

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.60m x 2.00m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474302E, 253704N	**Scale:** 1:25
			Ground Level:	98.00m OD	
Client:	Ashfield Land		**Date(s):**	20/04/17	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.30	ES					Firm brown gravelly sandy CLAY with rootlets and occasional brick fragments. Gravel is angular to subangular fine to coarse of limestone and flint. (MADE GROUND)
				0.30	97.70		
	0.70 - 1.40	ES		0.70	97.30		Light brown gravelly clayey SAND with high cobble content, whole bricks and boulders of limestone. Gravel is angular to subangular fine to coarse of sandstone, mudstone, aggregate and limestone. (MADE GROUND)
	1.30	HSV	50				Soft dark grey black mottled reddish orange and green gravelly sandy CLAY with high cobble content and boulders of limestone and ironstone. Gravel is angular to subangular fine to coarse of mudstone, limestone and ironstone. (MADE GROUND)
				1.40	96.60		Soft dark grey mottled red gravelly sandy CLAY with boulders and medium cobble content. Gravel is angular to subangular fine to coarse of ironstone, mudstone, sandstone and limestone and boulders and cobble grade fragments are of ironstone. (MADE GROUND)
				3.00	95.00		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks: 1) Trial pit terminated at 1.80m bgl due to very large boulders of approximately 1.00m diameter obstructing the excavator. 2)Water flooded into the trial pit upon moving the very large boulders 2) Backfilled with lightly compacted arisings.

Stability: Stable

Groundwater: No groundwater encountered.

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AA **Checked:** RB

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Trial Pit

Trial Pit No: TPT019

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474147E, 253690N	**Scale:** 1:25
			Ground Level:	98.11m OD	
Client:	Ashfield Land		**Date(s):**	31/08/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 - 0.30	ES		0.30	97.81		Firm dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL)
	1.20	ES					Firm greyish brown and multicoloured slightly sandy CLAY with gravel and cobble grade fragments of clinker and limestone. (MADE GROUND)
	2.80	B		2.60	95.51		Firm bluish grey mottled brown CLAY with occasional cobble grade fragments of limestone. (MADE GROUND)
				3.00	95.11		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AO **Checked:** RB

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Trial Pit

Trial Pit No: TPT020

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.60m x 2.00m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473324E, 253786N	**Scale:** 1:25
			Ground Level:	97.35m OD	
Client:	Ashfield Land		**Date(s):**	19/04/17	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00 - 0.30	ES		0.30	97.05		Stiff brown slightly gravelly sandy CLAY with rootlets and low cobble content. Gravel is angular to subangular fine to coarse of heterogenous, multicoloured composition of mudstone, limestone, ironstone, chert, concrete slab boulders, sandstone and siltstone. (TOPSOIL)
				1.00	96.35		Firm dark brown mottled orange slightly gravelly sandy CLAY with low cobble content and rare coal fragments. Gravel is angular to subrounded fine to coarse of heterogenous, multicoloured composition of mudstone, limestone, ironstone, flint, chert, sandstone and siltstone with cobble and boulder grade concrete slabs, limestone and cobble grade brick fragments. (MADE GROUND)
				3.00	94.35		Firm dark grey black mottled orange slightly gravelly CLAY with low cobble content and occasional boulders. Gravel is angular to subangular medium to coarse of limestone and ironstone. (MADE GROUND)
							End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks: 1)Backfilled with lightly compacted arisings.

Stability: Stable

Groundwater: No groundwater encountered.

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AA **Checked:** RB

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Trial Pit

Trial Pit No: TPT021

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474236E, 253800N	**Scale:** 1:25
			Ground Level:	97.66m OD	
Client:	Ashfield Land		**Date(s):**	30/08/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 - 0.30	ES		0.30	97.36		Firm dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL)
				1.50	96.16		Firm dark brown to brown CLAY with occasional bricks and cobble grade fragments of limestone. (MADE GROUND)
▼	1.80 - 2.40	B		3.00	94.66		Soft to firm bluiesh grey mottled orangeish red CLAY. (MADE GROUND)
							End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Pit remained stable

Groundwater: Seepage encountered at 2.1m.

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AO **Checked:** RB

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Trial Pit

Trial Pit No: TPT022

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474132E, 253774N	**Scale:** 1:25
			Ground Level:	97.44m OD	
Client:	Ashfield Land		**Date(s):**	31/08/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 - 0.30	ES		0.30	97.14		Firm dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL)
	1.50	ES					Firm reddish brown to brown slightly sandy CLAY with rare boulder and cobble grade fragments of limestone. (MADE GROUND)
	2.00	B					
				2.50	94.94		Soft dark greyish brown mottled orange slightly sandy CLAY with occasional cobble grade fragments of limestone. (MADE GROUND)
	2.80	B		2.80	94.64		End of Trial Pit at 2.80m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AO **Checked:** RB

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Trial Pit

Trial Pit No: TPT023

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474006E, 253807N	**Scale:** 1:25
			Ground Level:	96.01m OD	
Client:	Ashfield Land		**Date(s):**	01/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 - 0.30	ES		0.30	95.71		Firm dark brown slightly sandy CLAY with frequent rootlets. (MADE GROUND)
	1.50	ES					Firm light to dark brown slightly sandy gravelly CLAY with occasional cobble grade fragments of limestone. Gravel is siltstone. (MADE GROUND)
	2.00	B					
				2.40	93.61		Stiff dark greyish black mottled brown CLAY with occasional relict rootlets. (WHITBY MUDSTONE FORMATION)
	2.80	B					
	3.00	HSV	92	3.00	93.01		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AO **Checked:** RB

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Trial Pit

Trial Pit No: TPT024

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474050E, 253727N	**Scale:** 1:25
			Ground Level:	97.77m OD	
Client:	Ashfield Land		**Date(s):**	31/08/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 - 0.30	ES		0.30	97.47		Firm dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL)
	1.50	ES					Firm bluish grey mottled brown slightly sandy CLAY with rare cobble grade fragments of limestone. (MADE GROUND)
	2.30	B		2.20	95.57		Stiff bluish grey mottled black CLAY. Possible former ground level. (MADE GROUND)
	2.50	HSV	85	2.50	95.27		Stiff bluish grey mottled brown CLAY. (WHITBY MUDSTONE FORMATION)
	2.80	B					
	2.80	HSV	82				
				3.00	94.77		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AO **Checked:** RB

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Trial Pit

Trial Pit No: TPT025 Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473976E, 253822N	**Scale:** 1:25
			Ground Level:	94.05m OD	
Client:	Ashfield Land		**Date(s):**	01/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 - 0.30	ES					Firm dark brown slightly sandy CLAY with frequent rootlets. Sand is fine to coarse. (TOPSOIL)
				0.30	93.75		Firm reddish brown CLAY. (WHITBY MUDSTONE FORMATION)
				0.70	93.35		Stiff bluish grey mottled brown CLAY. (WHITBY MUDSTONE FORMATION)
	1.00	ES					
	1.00	HSV	80				
							.. At 1.5-1.8m bgl: Becoming gravelly. Subrounded to rounded fine to coarse of flint.
	1.80	B					
	2.00	HSV	70	2.00	92.05		Stiff bluish grey mottled brown CLAY with occasional sand grade gypsum crystals. (WHITBY MUDSTONE FORMATION)
	2.80	B					
	3.00	HSV	110	3.00	91.05		End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AO **Checked:** RB

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Trial Pit

Trial Pit No: TPT026

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	0.70m x 2.60m	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	473975E, 253884N	**Scale:** 1:25
			Ground Level:	93.20m OD	
Client:	Ashfield Land		**Date(s):**	01/09/16	**Plant Used:** JCB

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 - 0.30	ES		0.30	92.90		Firm dark brown slightly sandy CLAY with frequent rootlets. (TOPSOIL)
							Firm reddish brown CLAY. (WHITBY MUDSTONE FORMATION)
	1.00	ES		0.90	92.30		Stiff bluish grey mottled brown CLAY with occasional thin beds of sand grade gypsum crystals. Colour darkens with depth. (WHITBY MUDSTONE FORMATION)
	1.00	HSV	100				
	1.50	B					
	2.00	HSV	130				
				2.50	90.70		Stiff thinly bedded dark grey mottled brown CLAY with occasional sand grade gypsum crystals and relict rootlets. (WHITBY MUDSTONE FORMATION)
	2.80	B					
	3.00	HSV	80	3.00	90.20		End of Trial Pit at 3.00m

1.0 2.0 3.0 4.0 5.0

Remarks:

Stability: Pit remained stable

Groundwater: Groundwater not encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: AO **Checked:** RB

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Trial Pit

Trial Pit No: TPT027

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474085E, 255072N	**Scale:** 1:25
			Ground Level:	84.29m OD	
Client:	Ashfield Land		**Date(s):**	12/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.30	83.99		Brown cobbly very gravelly fine to coarse SAND with a medium cobble content. Gravel and cobbles are fine to coarse angular to subrounded of concrete, brick, tile, glass, plastic, wire and wood. (MADE GROUND)
	0.40	ES					
				0.50	83.79		Reddish brown and brown gravelly fine to coarse SAND. Gravel is fine to coarse angular to subrounded of brick, ash, concrete and tile. (MADE GROUND)
							Stiff greenish grey very sandy CLAY with occasional roots and rootlets with small pockets of ash. (MADE GROUND)
	1.00	B					
				1.25	83.04		Firm yellowish brown sandy gravelly CLAY with roots. Gravel is fine to coarse, angular to subrounded of flint and mudstone. (GLACIOFLUVIAL DEPOSITS)
	1.60	D					
	1.60	HSV	74				
				1.80	82.49		Stiff grey mottled brown slightly sandy gravelly CLAY. Gravel is fine to coarse angular to subrounded of mudstone. (WHITBY MUDSTONE FORMATION)
	2.20	B					
	2.20	HSV	132				
				2.60	81.69		End of Trial Pit at 2.60m

1.0 2.0 3.0 4.0 5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

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Trial Pit

Trial Pit No: TPT028

Sheet 1 of 1

Project Name:	Rail Central		**Dimensions:**	-	**Hole Type:** TP
Location:	Milton Malsor, Northampton	**Project No:** C151171	**Co-ords:**	474089E, 255044N	**Scale:** 1:25
			Ground Level:	84.35m OD	
Client:	Ashfield Land		**Date(s):**	12/09/16	**Plant Used:** JCB 3CX

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30	ES		0.35	84.00		Dark brown gravelly fine to coarse SAND with a medium cobble content. Gravel and cobbles are fine to coarse angular to subrounded of brick, concrete and flint. (MADE GROUND)
				0.50	83.85		Greyish brown very clayey fine to coarse SAND. (GLACIOFLUVIAL DEPOSITS)
	0.90	B					Soft brown very sandy slightly gravelly CLAY. Gravel is fine to coarse angular to subangular of mudstone. (GLACIOFLUVIAL DEPOSITS)
	1.40	HSV	80	1.30	83.05		Stiff grey mottled brown CLAY with clayey slightly gravelly pockets of fine to coarse sand. (WHITBY MUDSTONE FORMATION)
	2.50 2.50	B HSV	106				
				2.70	81.65		End of Trial Pit at 2.70m

1.0
2.0
3.0
4.0
5.0

Remarks: Trial Pit backfilled with arisings on completion

Stability: Stable

Groundwater: No groundwater encountered

B = Bulk Sample
D = Disturbed Sample
ES = Environmental Sample
W = Water Sample
PID = Photoionization Detector (ppm)
CBR = In Situ California Bearing Ratio (%)
HSV = Hand Shear Vane (kPa)
HP = Hand Penetrometer (kPa)
AB = Asbestos Bulk Sample

Logged: WS **Checked:** RB

1 DAY INFILTRATION ASSESSMENT - WORKSHEET

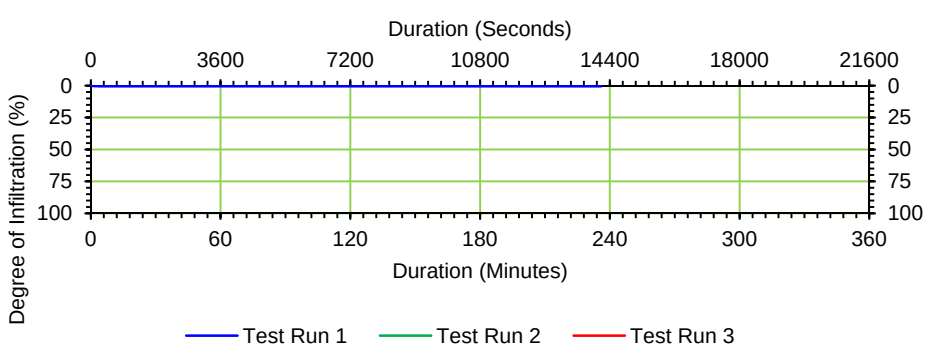
Site: Rail Central
Client: Ashfield Land
Test Location TPA019 **Date of start** 15/09/2016 **Date at end** 15/09/2016

Test Run 1		Test Run 2		Test Run 3	
Pit Dimensions (m)		**Pit Dimensions (m)**		**Pit Dimensions (m)**	
Trial Pit Length (L)	1.750m	Trial Pit Length (L)		Trial Pit Length (L)	
Trial Pit Breadth / Width (B)	0.600m	Trial Pit Breadth / Width (B)		Trial Pit Breadth / Width (B)	
Effective Depth (D)	2.800m	Effective Depth (D)		Effective Depth (D)	
Time at Start of Filling	11.26	Time at Start of Filling		Time at Start of Filling	
Time at End of Filling	11.29	Time at End of Filling		Time at End of Filling	
Depth from Surface to Water (D_{TW})	1.265m	Depth below Surface to Water (D_{TW})		Depth below Surface to Water (D_{TW})	
Water Depth (W_D)	1.535m	Water Depth (W_D)	-	Water Depth (W_D)	-
Maximum Fill Volume (V_W)	1.612m³	Maximum Fill Volume (V_W)	-	Maximum Fill Volume (V_W)	-
Gravel used to backfill Test Pit	No	Gravel used to backfill Test Pit	No	Gravel used to backfill Test Pit	No
Porosity of Gravel Backfill (P_t)	0.300	Porosity of Gravel Backfill (P_t)		Porosity of Gravel Backfill (P_t)	
Corrected Water Volume (V_{WC})	1.612m³	Corrected Water Volume (V_{WC})	-	Corrected Water Volume (V_{WC})	-

Time to soakaway

Time		Depth to water	Duration	Time		Depth to water	Duration	Time		Depth to water	Duration
Day	Time	(m bgl)	Seconds	Day	Time	(m bgl)	Seconds	Day	Time	(m bgl)	Seconds
1	11.290	1.265	0								
1	11.300	1.268	60								
1	11.310	1.270	120								
1	11.320	1.271	180								
1	11.330	1.272	240								
1	11.360	1.272	420								
1	11.500	1.272	1260								
1	12.260	1.272	3420								
1	13.560	1.272	8820								
1	15.250	1.272	14160								
			14160								
			14160								
			14160								
			14160								
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			14160								
			14160								
			14160								
			14160								
			14160								
			14160								
			14160								

25% water loss (75% full)	1.649m	**25% water loss (75% full)**	-	**25% water loss (75% full)**	-
50% water loss (50% full)	2.033m	**50% water loss (50% full)**	-	**50% water loss (50% full)**	-
75% water loss (25% full)	2.416m	**75% water loss (25% full)**	-	**75% water loss (25% full)**	-
25% time (seconds)	-	**25% time (seconds)**	-	**25% time (seconds)**	-
75% time (seconds)	-	**75% time (seconds)**	-	**75% time (seconds)**	-
Vp 75-25	0.806m³	**Vp 75-25**	-	**Vp 75-25**	-
as 50 (Actual area from test)	10.603m²	**as 50 (Actual area from test)**	-	**as 50 (Actual area from test)**	-
tp 75 - 25		**tp 75 - 25**		**tp 75 - 25**	
Soil Infiltration Rate	-	**Soil Infiltration Rate**	-	**Soil Infiltration Rate**	-



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1 DAY INFILTRATION ASSESSMENT - WORKSHEET

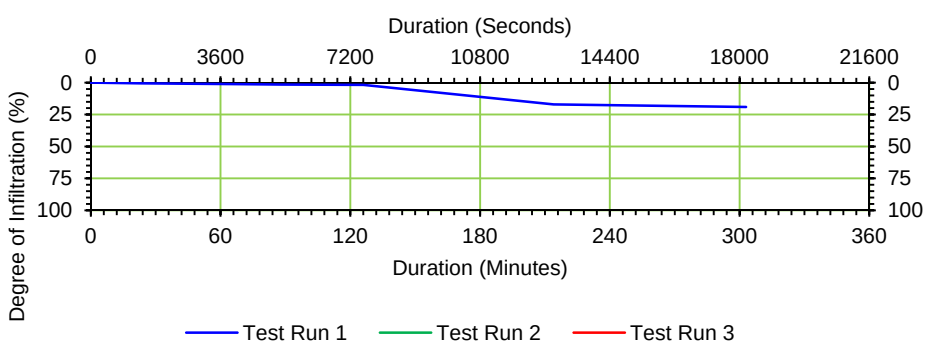
Site: Rail Central
Client: Ashfield Land
Test Location TPA023 **Date of start** 15/09/2016 **Date at end** 15/09/2016

Test Run 1		Test Run 2		Test Run 3	
Pit Dimensions (m)		**Pit Dimensions (m)**		**Pit Dimensions (m)**	
Trial Pit Length (L)	1.850m	Trial Pit Length (L)		Trial Pit Length (L)	
Trial Pit Breadth / Width (B)	0.600m	Trial Pit Breadth / Width (B)		Trial Pit Breadth / Width (B)	
Effective Depth (D)	1.700m	Effective Depth (D)		Effective Depth (D)	
Time at Start of Filling	10.16	Time at Start of Filling		Time at Start of Filling	
Time at End of Filling	10.19	Time at End of Filling		Time at End of Filling	
Depth from Surface to Water (D_{TW})	1.018m	Depth below Surface to Water (D_{TW})		Depth below Surface to Water (D_{TW})	
Water Depth (W_D)	0.682m	Water Depth (W_D)	-	Water Depth (W_D)	-
Maximum Fill Volume (V_W)	0.757m³	Maximum Fill Volume (V_W)	-	Maximum Fill Volume (V_W)	-
Gravel used to backfill Test Pit	No	Gravel used to backfill Test Pit	No	Gravel used to backfill Test Pit	No
Porosity of Gravel Backfill (P_t)	0.300	Porosity of Gravel Backfill (P_t)		Porosity of Gravel Backfill (P_t)	
Corrected Water Volume (V_{WC})	0.757m³	Corrected Water Volume (V_{WC})	-	Corrected Water Volume (V_{WC})	-

Time to soakaway

Time		Depth to water	Duration	Time		Depth to water	Duration	Time		Depth to water	Duration
Day	Time	(m bgl)	Seconds	Day	Time	(m bgl)	Seconds	Day	Time	(m bgl)	Seconds
1	10.190	1.018	0								
1	10.200	1.018	60								
1	10.210	1.018	120								
1	10.220	1.018	180								
1	10.230	1.019	240								
1	10.240	1.019	300								
1	10.300	1.020	660								
1	10.480	1.022	1740								
1	11.240	1.026	3900								
1	11.470	1.028	5280								
1	12.250	1.030	7560								
1	13.530	1.134	12840								
1	15.220	1.148	18180								
			18180								
			18180								
			18180								
			18180								
			18180								
			18180								
			18180								
			18180								
			18180								
			18180								
			18180								

25% water loss (75% full)			1.189m	**25% water loss (75% full)**			-	**25% water loss (75% full)**			-
50% water loss (50% full)			1.359m	**50% water loss (50% full)**			-	**50% water loss (50% full)**			-
75% water loss (25% full)			1.530m	**75% water loss (25% full)**			-	**75% water loss (25% full)**			-
25% time (seconds)			-	**25% time (seconds)**			-	**25% time (seconds)**			-
75% time (seconds)			-	**75% time (seconds)**			-	**75% time (seconds)**			-
Vp 75-25			0.379m³	**Vp 75-25**			-	**Vp 75-25**			-
as 50 (Actual area from test)			7.769m²	**as 50 (Actual area from test)**			-	**as 50 (Actual area from test)**			-
tp 75 - 25				**tp 75 - 25**				**tp 75 - 25**			
Soil Infiltration Rate		-		**Soil Infiltration Rate**		-		**Soil Infiltration Rate**		-	



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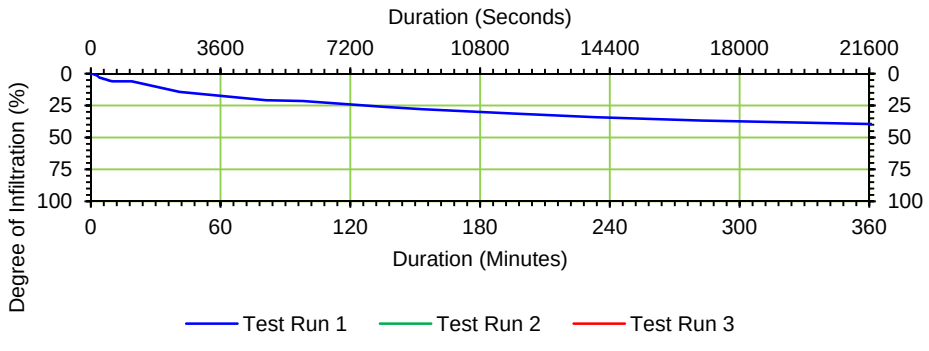
1 DAY INFILTRATION ASSESSMENT - WORKSHEET

Site: Rail Central
Client: Ashfield Land
Test Location TPA027 **Date of start** 15/09/2016 **Date at end** 15/09/2016

Test Run 1		Test Run 2		Test Run 3	
Pit Dimensions (m)		**Pit Dimensions (m)**		**Pit Dimensions (m)**	
Trial Pit Length (L)	1.600m	Trial Pit Length (L)		Trial Pit Length (L)	
Trial Pit Breadth / Width (B)	0.600m	Trial Pit Breadth / Width (B)		Trial Pit Breadth / Width (B)	
Effective Depth (D)	2.000m	Effective Depth (D)		Effective Depth (D)	
Time at Start of Filling	9.02	Time at Start of Filling		Time at Start of Filling	
Time at End of Filling	9.06	Time at End of Filling		Time at End of Filling	
Depth from Surface to Water (D_{TW})	1.038m	Depth below Surface to Water (D_{TW})		Depth below Surface to Water (D_{TW})	
Water Depth (W_D)	0.962m	Water Depth (W_D)	-	Water Depth (W_D)	-
Maximum Fill Volume (V_W)	0.924m³	Maximum Fill Volume (V_W)	-	Maximum Fill Volume (V_W)	-
Gravel used to backfill Test Pit	No	Gravel used to backfill Test Pit	No	Gravel used to backfill Test Pit	No
Porosity of Gravel Backfill (P_t)	0.300	Porosity of Gravel Backfill (P_t)		Porosity of Gravel Backfill (P_t)	
Corrected Water Volume (V_{WC})	0.924m³	Corrected Water Volume (V_{WC})	-	Corrected Water Volume (V_{WC})	-

Test Run 1 – Time to soakaway				Test Run 2 – Time to soakaway				Test Run 3 – Time to soakaway			
Time		Depth to water	Duration	Time		Depth to water	Duration	Time		Depth to water	Duration
Day	Time	(m bgl)	Seconds	Day	Time	(m bgl)	Seconds	Day	Time	(m bgl)	Seconds
1	9.060	1.038	0								
1	9.070	1.040	60								
1	9.080	1.046	120								
1	9.090	1.054	180								
1	9.100	1.068	240								
1	9.110	1.072	300								
1	9.120	1.078	360								
1	9.130	1.082	420								
1	9.140	1.088	480								
1	9.150	1.092	540								
1	9.160	1.096	600								
1	9.250	1.044	1140								
1	9.470	1.176	2460								
1	10.270	1.238	4860								
1	10.440	1.244	5880								
1	11.210	1.288	8100								
1	11.390	1.306	9180								
1	12.210	1.338	11700								
1	12.590	1.366	13980								
1	13.480	1.392	16920								
1	15.180	1.422	22320								
			22320								
			22320								

25% water loss (75% full)	1.279m	**25% water loss (75% full)**	-	**25% water loss (75% full)**	-
50% water loss (50% full)	1.519m	**50% water loss (50% full)**	-	**50% water loss (50% full)**	-
75% water loss (25% full)	1.760m	**75% water loss (25% full)**	-	**75% water loss (25% full)**	-
25% time (seconds)	7621 sec	**25% time (seconds)**	-	**25% time (seconds)**	-
75% time (seconds)	-	**75% time (seconds)**	-	**75% time (seconds)**	-
Vp 75-25	0.462m³	**Vp 75-25**	-	**Vp 75-25**	-
as 50 (Actual area from test)	7.644m²	**as 50 (Actual area from test)**	-	**as 50 (Actual area from test)**	-
tp 75 - 25		**tp 75 - 25**		**tp 75 - 25**	
Soil Infiltration Rate	-	**Soil Infiltration Rate**	-	**Soil Infiltration Rate**	-



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1 DAY INFILTRATION ASSESSMENT - WORKSHEET

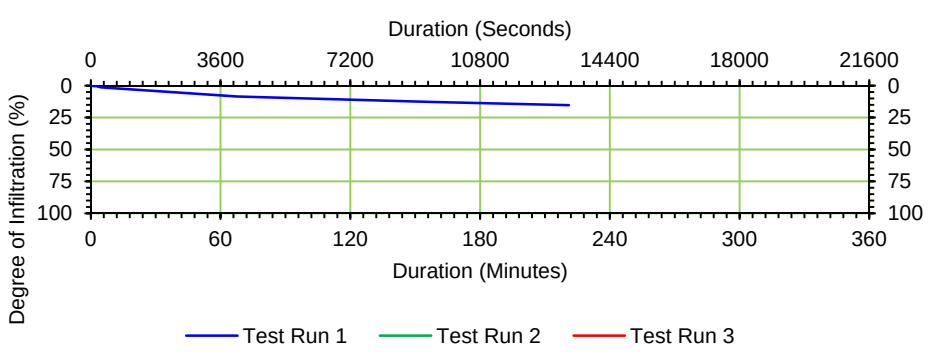
Site: Rail Central
Client: Ashfield Land
Test Location TPA032 **Date of start** 15/09/2016 **Date at end** 15/09/2016

Test Run 1		Test Run 2		Test Run 3	
Pit Dimensions (m)		**Pit Dimensions (m)**		**Pit Dimensions (m)**	
Trial Pit Length (L)	2.100m	Trial Pit Length (L)		Trial Pit Length (L)	
Trial Pit Breadth / Width (B)	0.600m	Trial Pit Breadth / Width (B)		Trial Pit Breadth / Width (B)	
Effective Depth (D)	2.000m	Effective Depth (D)		Effective Depth (D)	
Time at Start of Filling	12.48	Time at Start of Filling		Time at Start of Filling	
Time at End of Filling	12.51	Time at End of Filling		Time at End of Filling	
Depth from Surface to Water (D_{TW})	0.945m	Depth below Surface to Water (D_{TW})		Depth below Surface to Water (D_{TW})	
Water Depth (W_D)	1.055m	Water Depth (W_D)	-	Water Depth (W_D)	-
Maximum Fill Volume (V_W)	1.329m³	Maximum Fill Volume (V_W)	-	Maximum Fill Volume (V_W)	-
Gravel used to backfill Test Pit	No	Gravel used to backfill Test Pit	No	Gravel used to backfill Test Pit	No
Porosity of Gravel Backfill (P_t)	0.300	Porosity of Gravel Backfill (P_t)		Porosity of Gravel Backfill (P_t)	
Corrected Water Volume (V_{WC})	1.329m³	Corrected Water Volume (V_{WC})	-	Corrected Water Volume (V_{WC})	-

Time to soakaway

Time		Depth to water	Duration	Time		Depth to water	Duration	Time		Depth to water	Duration
Day	Time	(m bgl)	Seconds	Day	Time	(m bgl)	Seconds	Day	Time	(m bgl)	Seconds
1	12.510	0.945	0								
1	12.520	0.948	60								
1	12.530	0.949	120								
1	12.540	0.950	180								
1	12.550	0.956	240								
1	12.560	0.960	300								
1	13.590	1.035	4080								
1	15.290	1.080	9480								
1	16.320	1.107	13260								
			13260								
			13260								
			13260								
			13260								
			13260								
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			13260								
			13260								

25% water loss (75% full)	1.209m	**25% water loss (75% full)**	-	**25% water loss (75% full)**	-
50% water loss (50% full)	1.473m	**50% water loss (50% full)**	-	**50% water loss (50% full)**	-
75% water loss (25% full)	1.736m	**75% water loss (25% full)**	-	**75% water loss (25% full)**	-
25% time (seconds)	-	**25% time (seconds)**	-	**25% time (seconds)**	-
75% time (seconds)	-	**75% time (seconds)**	-	**75% time (seconds)**	-
Vp 75-25	0.665m³	**Vp 75-25**	-	**Vp 75-25**	-
as 50 (Actual area from test)	9.212m²	**as 50 (Actual area from test)**	-	**as 50 (Actual area from test)**	-
tp 75 - 25		**tp 75 - 25**		**tp 75 - 25**	
Soil Infiltration Rate	-	**Soil Infiltration Rate**	-	**Soil Infiltration Rate**	-



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1 DAY INFILTRATION ASSESSMENT - WORKSHEET

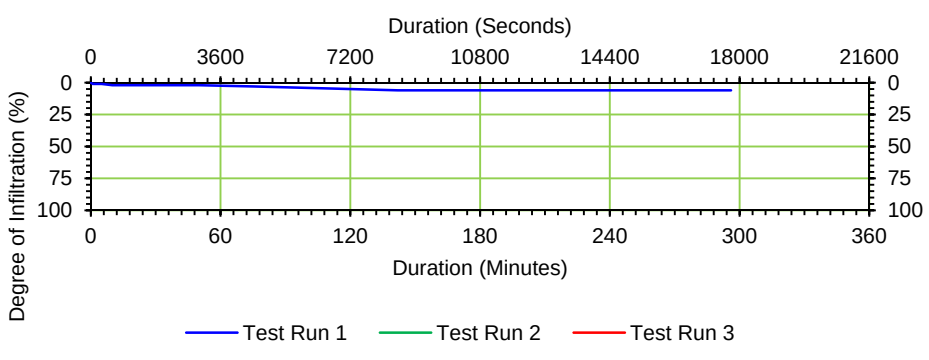
Site: Rail Central
Client: Ashfield Land
Test Location TPG029 **Date of start** 27/09/2016 **Date at end** 27/09/2016

Test Run 1		Test Run 2		Test Run 3	
Pit Dimensions (m)		**Pit Dimensions (m)**		**Pit Dimensions (m)**	
Trial Pit Length (L)	2.000m	Trial Pit Length (L)		Trial Pit Length (L)	
Trial Pit Breadth / Width (B)	0.700m	Trial Pit Breadth / Width (B)		Trial Pit Breadth / Width (B)	
Effective Depth (D)	2.100m	Effective Depth (D)		Effective Depth (D)	
Time at Start of Filling	10.19	Time at Start of Filling		Time at Start of Filling	
Time at End of Filling	10.22	Time at End of Filling		Time at End of Filling	
Depth from Surface to Water (D_{TW})	1.100m	Depth below Surface to Water (D_{TW})		Depth below Surface to Water (D_{TW})	
Water Depth (W_D)	1.000m	Water Depth (W_D)	-	Water Depth (W_D)	-
Maximum Fill Volume (V_W)	1.400m³	Maximum Fill Volume (V_W)	-	Maximum Fill Volume (V_W)	-
Gravel used to backfill Test Pit	No	Gravel used to backfill Test Pit	No	Gravel used to backfill Test Pit	No
Porosity of Gravel Backfill (P_t)	0.300	Porosity of Gravel Backfill (P_t)		Porosity of Gravel Backfill (P_t)	
Corrected Water Volume (V_{WC})	1.400m³	Corrected Water Volume (V_{WC})	-	Corrected Water Volume (V_{WC})	-

Time to soakaway

Time		Depth to water	Duration	Time		Depth to water	Duration	Time		Depth to water	Duration
Day	Time	(m bgl)	Seconds	Day	Time	(m bgl)	Seconds	Day	Time	(m bgl)	Seconds
1	10.220	1.100	0								
1	10.230	1.110	60								
1	10.270	1.110	300								
1	10.320	1.120	600								
1	10.420	1.120	1200								
1	11.120	1.120	3000								
1	11.380	1.130	4560								
1	12.440	1.160	8520								
1	13.140	1.160	10320								
1	13.390	1.160	11820								
1	14.190	1.160	14220								
1	14.410	1.160	15540								
1	15.180	1.160	17760								
			17760								
			17760								
			17760								
			17760								
			17760								
			17760								
			17760								
			17760								
			17760								
			17760								
			17760								

25% water loss (75% full)	1.350m	**25% water loss (75% full)**	-	**25% water loss (75% full)**	-
50% water loss (50% full)	1.600m	**50% water loss (50% full)**	-	**50% water loss (50% full)**	-
75% water loss (25% full)	1.850m	**75% water loss (25% full)**	-	**75% water loss (25% full)**	-
25% time (seconds)	-	**25% time (seconds)**	-	**25% time (seconds)**	-
75% time (seconds)	-	**75% time (seconds)**	-	**75% time (seconds)**	-
Vp 75-25	0.700m³	**Vp 75-25**	-	**Vp 75-25**	-
as 50 (Actual area from test)	10.040m²	**as 50 (Actual area from test)**	-	**as 50 (Actual area from test)**	-
tp 75 - 25		**tp 75 - 25**		**tp 75 - 25**	
Soil Infiltration Rate	-	**Soil Infiltration Rate**	-	**Soil Infiltration Rate**	-



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1 DAY INFILTRATION ASSESSMENT - WORKSHEET

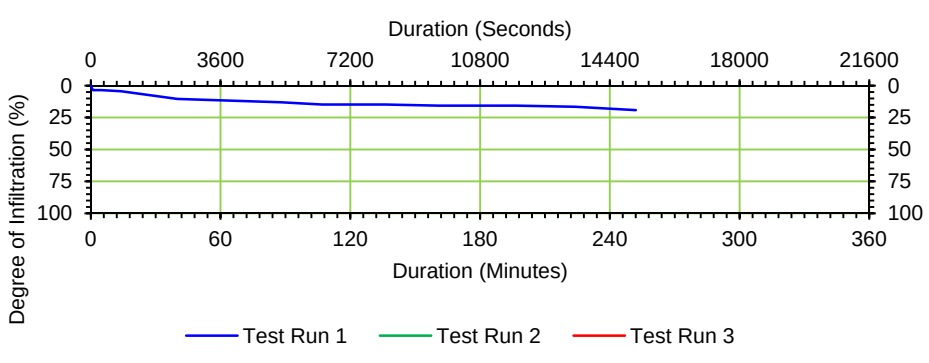
Site: Rail Central
Client: Ashfield Land
Test Location TPG030 **Date of start** 27/09/2016 **Date at end** 27/09/2016

Test Run 1		Test Run 2		Test Run 3	
Pit Dimensions (m)		**Pit Dimensions (m)**		**Pit Dimensions (m)**	
Trial Pit Length (L)	2.000m	Trial Pit Length (L)		Trial Pit Length (L)	
Trial Pit Breadth / Width (B)	0.700m	Trial Pit Breadth / Width (B)		Trial Pit Breadth / Width (B)	
Effective Depth (D)	1.900m	Effective Depth (D)		Effective Depth (D)	
Time at Start of Filling	10.57	Time at Start of Filling		Time at Start of Filling	
Time at End of Filling	11.00	Time at End of Filling		Time at End of Filling	
Depth from Surface to Water (D_{TW})	0.750m	Depth below Surface to Water (D_{TW})		Depth below Surface to Water (D_{TW})	
Water Depth (W_D)	1.150m	Water Depth (W_D)	-	Water Depth (W_D)	-
Maximum Fill Volume (V_W)	1.610m³	Maximum Fill Volume (V_W)	-	Maximum Fill Volume (V_W)	-
Gravel used to backfill Test Pit	No	Gravel used to backfill Test Pit	No	Gravel used to backfill Test Pit	No
Porosity of Gravel Backfill (P_t)	0.300	Porosity of Gravel Backfill (P_t)		Porosity of Gravel Backfill (P_t)	
Corrected Water Volume (V_{WC})	1.610m³	Corrected Water Volume (V_{WC})	-	Corrected Water Volume (V_{WC})	-

Time to soakaway

Time		Depth to water	Duration	Time		Depth to water	Duration	Time		Depth to water	Duration
Day	Time	(m bgl)	Seconds	Day	Time	(m bgl)	Seconds	Day	Time	(m bgl)	Seconds
1	11.000	0.750	0								
1	11.010	0.790	60								
1	11.050	0.790	300								
1	11.140	0.800	840								
1	11.400	0.870	2400								
1	12.280	0.900	5280								
1	12.470	0.920	6420								
1	13.160	0.920	8160								
1	13.410	0.930	9660								
1	14.170	0.930	11820								
1	14.440	0.940	13440								
1	15.120	0.970	15120								
			15120								
			15120								
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			15120								
			15120								

25% water loss (75% full)	1.038m	**25% water loss (75% full)**	-	**25% water loss (75% full)**	-
50% water loss (50% full)	1.325m	**50% water loss (50% full)**	-	**50% water loss (50% full)**	-
75% water loss (25% full)	1.613m	**75% water loss (25% full)**	-	**75% water loss (25% full)**	-
25% time (seconds)	-	**25% time (seconds)**	-	**25% time (seconds)**	-
75% time (seconds)	-	**75% time (seconds)**	-	**75% time (seconds)**	-
Vp 75-25	0.805m³	**Vp 75-25**	-	**Vp 75-25**	-
as 50 (Actual area from test)	8.555m²	**as 50 (Actual area from test)**	-	**as 50 (Actual area from test)**	-
tp 75 - 25		**tp 75 - 25**		**tp 75 - 25**	
Soil Infiltration Rate	-	**Soil Infiltration Rate**	-	**Soil Infiltration Rate**	-



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1 DAY INFILTRATION ASSESSMENT - WORKSHEET

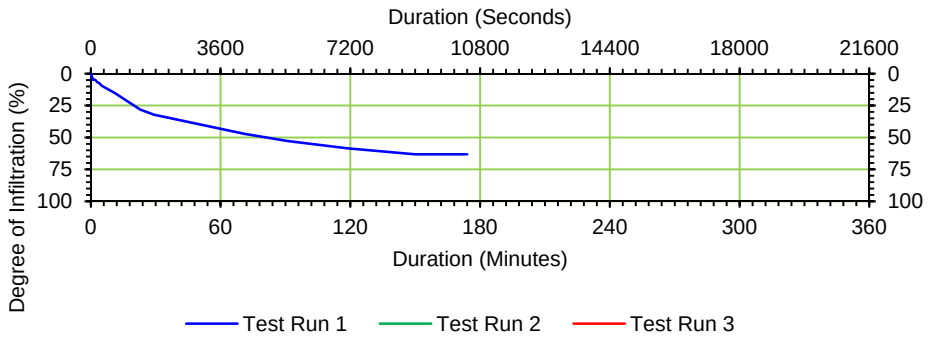
Site: Rail Central
Client: Ashfield Land
Test Location TPG038 **Date of start** 27/09/2016 **Date at end** 27/09/2016

Test Run 1		Test Run 2		Test Run 3	
Pit Dimensions (m)		**Pit Dimensions (m)**		**Pit Dimensions (m)**	
Trial Pit Length (L)	2.100m	Trial Pit Length (L)		Trial Pit Length (L)	
Trial Pit Breadth / Width (B)	0.700m	Trial Pit Breadth / Width (B)		Trial Pit Breadth / Width (B)	
Effective Depth (D)	2.200m	Effective Depth (D)		Effective Depth (D)	
Time at Start of Filling	11.16	Time at Start of Filling		Time at Start of Filling	
Time at End of Filling	11.19	Time at End of Filling		Time at End of Filling	
Depth from Surface to Water (D_{TW})	1.140m	Depth below Surface to Water (D_{TW})		Depth below Surface to Water (D_{TW})	
Water Depth (W_D)	1.060m	Water Depth (W_D)	-	Water Depth (W_D)	-
Maximum Fill Volume (V_W)	1.558m³	Maximum Fill Volume (V_W)	-	Maximum Fill Volume (V_W)	-
Gravel used to backfill Test Pit	No	Gravel used to backfill Test Pit	No	Gravel used to backfill Test Pit	No
Porosity of Gravel Backfill (P_t)	0.300	Porosity of Gravel Backfill (P_t)		Porosity of Gravel Backfill (P_t)	
Corrected Water Volume (V_{WC})	1.558m³	Corrected Water Volume (V_{WC})	-	Corrected Water Volume (V_{WC})	-

Time to soakaway

Time		Depth to water	Duration	Time		Depth to water	Duration	Time		Depth to water	Duration
Day	Time	(m bgl)	Seconds	Day	Time	(m bgl)	Seconds	Day	Time	(m bgl)	Seconds
1	11.190	1.140	0								
1	11.200	1.190	60								
1	11.210	1.190	120								
1	11.220	1.210	180								
1	11.230	1.220	240								
1	11.240	1.240	300								
1	11.250	1.250	360								
1	11.300	1.300	660								
1	11.420	1.440	1380								
1	11.480	1.480	1740								
1	12.300	1.640	4260								
1	12.500	1.700	5460								
1	13.180	1.760	7140								
1	13.490	1.810	9000								
1	14.130	1.810	10440								
			10440								
			10440								
			10440								
			10440								
			10440								
			10440								
			10440								
			10440								
			10440								

25% water loss (75% full)	1.405m	**25% water loss (75% full)**	-	**25% water loss (75% full)**	-
50% water loss (50% full)	1.670m	**50% water loss (50% full)**	-	**50% water loss (50% full)**	-
75% water loss (25% full)	1.935m	**75% water loss (25% full)**	-	**75% water loss (25% full)**	-
25% time (seconds)	1200 sec	**25% time (seconds)**	-	**25% time (seconds)**	-
75% time (seconds)	-	**75% time (seconds)**	-	**75% time (seconds)**	-
Vp 75-25	0.779m³	**Vp 75-25**	-	**Vp 75-25**	-
as 50 (Actual area from test)	10.822m²	**as 50 (Actual area from test)**	-	**as 50 (Actual area from test)**	-
tp 75 - 25		**tp 75 - 25**		**tp 75 - 25**	
Soil Infiltration Rate	-	**Soil Infiltration Rate**	-	**Soil Infiltration Rate**	-



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1 DAY INFILTRATION ASSESSMENT - WORKSHEET

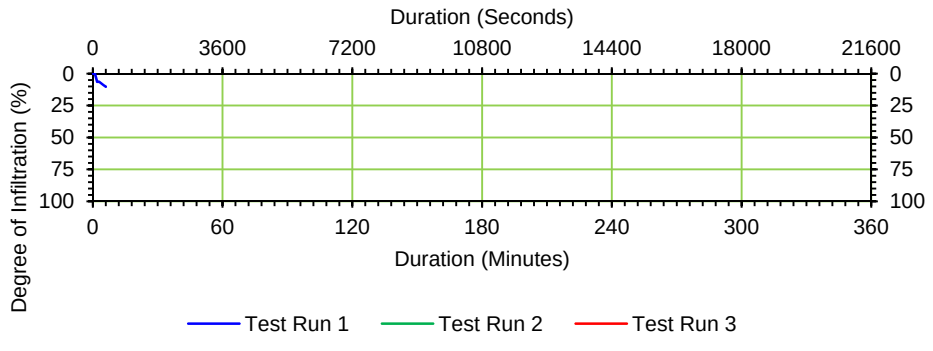
Site: Rail Central
Client: Ashfield Land
Test Location TPG039 **Date of start** 27/09/2016 **Date at end** 27/09/2016

Test Run 1		Test Run 2		Test Run 3	
Pit Dimensions (m)		**Pit Dimensions (m)**		**Pit Dimensions (m)**	
Trial Pit Length (L)	2.400m	Trial Pit Length (L)		Trial Pit Length (L)	
Trial Pit Breadth / Width (B)	0.700m	Trial Pit Breadth / Width (B)		Trial Pit Breadth / Width (B)	
Effective Depth (D)	2.100m	Effective Depth (D)		Effective Depth (D)	
Time at Start of Filling	12.00	Time at Start of Filling		Time at Start of Filling	
Time at End of Filling	12.03	Time at End of Filling		Time at End of Filling	
Depth from Surface to Water (D_{TW})	1.320m	Depth below Surface to Water (D_{TW})		Depth below Surface to Water (D_{TW})	
Water Depth (W_D)	0.780m	Water Depth (W_D)	-	Water Depth (W_D)	-
Maximum Fill Volume (V_W)	1.310m³	Maximum Fill Volume (V_W)	-	Maximum Fill Volume (V_W)	-
Gravel used to backfill Test Pit	No	Gravel used to backfill Test Pit	No	Gravel used to backfill Test Pit	No
Porosity of Gravel Backfill (P_t)	0.300	Porosity of Gravel Backfill (P_t)		Porosity of Gravel Backfill (P_t)	
Corrected Water Volume (V_{WC})	1.310m³	Corrected Water Volume (V_{WC})	-	Corrected Water Volume (V_{WC})	-

Time to soakaway

Time		Depth to water	Duration	Time		Depth to water	Duration	Time		Depth to water	Duration
Day	Time	(m bgl)	Seconds	Day	Time	(m bgl)	Seconds	Day	Time	(m bgl)	Seconds
1	12.030	1.320	0								
1	12.040	1.320	60								
1	12.050	1.370	120								
1	12.060	1.370	180								
1	12.080	1.390	300								
1	12.090	1.400	360								
			360								
			360								
			360								
			360								
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25% water loss (75% full)			1.515m	**25% water loss (75% full)**			-	**25% water loss (75% full)**			-
50% water loss (50% full)			1.710m	**50% water loss (50% full)**			-	**50% water loss (50% full)**			-
75% water loss (25% full)			1.905m	**75% water loss (25% full)**			-	**75% water loss (25% full)**			-
25% time (seconds)			-	**25% time (seconds)**			-	**25% time (seconds)**			-
75% time (seconds)			-	**75% time (seconds)**			-	**75% time (seconds)**			-
Vp 75-25			0.655m³	**Vp 75-25**			-	**Vp 75-25**			-
as 50 (Actual area from test)			12.282m²	**as 50 (Actual area from test)**			-	**as 50 (Actual area from test)**			-
tp 75 - 25				**tp 75 - 25**				**tp 75 - 25**			
Soil Infiltration Rate		-		**Soil Infiltration Rate**		-		**Soil Infiltration Rate**		-	



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1 DAY INFILTRATION ASSESSMENT - WORKSHEET

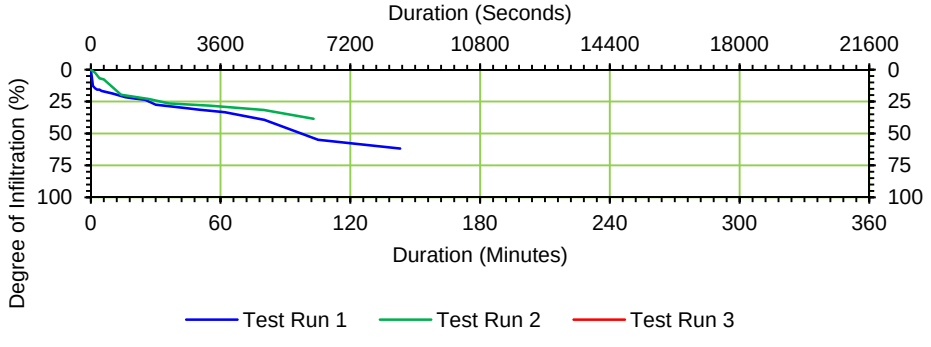
Site: Rail Central
Client: Ashfield Land
Test Location TPG040 **Date of start** 27/09/2016 **Date at end** 27/09/2016

Test Run 1		Test Run 2		Test Run 3	
Pit Dimensions (m)		**Pit Dimensions (m)**		**Pit Dimensions (m)**	
Trial Pit Length (L)	1.800m	Trial Pit Length (L)	1.800m	Trial Pit Length (L)	
Trial Pit Breadth / Width (B)	0.700m	Trial Pit Breadth / Width (B)	0.700m	Trial Pit Breadth / Width (B)	
Effective Depth (D)	2.200m	Effective Depth (D)	2.200m	Effective Depth (D)	
Time at Start of Filling	9.47	Time at Start of Filling	12.13	Time at Start of Filling	
Time at End of Filling	9.50	Time at End of Filling	12.17	Time at End of Filling	
Depth from Surface to Water (D_{TW})	1.180m	Depth below Surface to Water (D_{TW})	1.030m	Depth below Surface to Water (D_{TW})	
Water Depth (W_D)	1.020m	Water Depth (W_D)	1.170m	Water Depth (W_D)	-
Maximum Fill Volume (V_W)	1.285m³	Maximum Fill Volume (V_W)	1.474m³	Maximum Fill Volume (V_W)	-
Gravel used to backfill Test Pit	No	Gravel used to backfill Test Pit	No	Gravel used to backfill Test Pit	No
Porosity of Gravel Backfill (P_t)	0.300	Porosity of Gravel Backfill (P_t)		Porosity of Gravel Backfill (P_t)	
Corrected Water Volume (V_{WC})	1.285m³	Corrected Water Volume (V_{WC})	1.474m³	Corrected Water Volume (V_{WC})	-

Time to soakaway

Time		Depth to water	Duration	Time		Depth to water	Duration	Time		Depth to water	Duration
Day	Time	(m bgl)	Seconds	Day	Time	(m bgl)	Seconds	Day	Time	(m bgl)	Seconds
1	9.500	1.180	0	1	12.170	1.030	0				
1	9.510	1.310	60	1	12.190	1.060	120				
1	9.520	1.330	120	1	12.210	1.110	240				
1	9.530	1.340	180	1	12.230	1.120	360				
1	9.540	1.340	240	1	12.310	1.260	840				
1	9.550	1.350	300	1	12.440	1.300	1620				
1	10.000	1.370	600	1	12.530	1.340	2160				
1	10.060	1.400	960	1	13.120	1.360	3300				
1	10.100	1.410	1200	1	13.370	1.400	4800				
1	10.150	1.420	1500	1	14.000	1.480	6180				
1	10.200	1.460	1800				6180				
1	10.350	1.490	2700				6180				
1	10.400	1.500	3000				6180				
1	10.520	1.520	3720				6180				
1	11.100	1.580	4800				6180				
1	11.350	1.740	6300				6180				
1	12.130	1.810	8580				6180				
			8580				6180				
			8580				6180				
			8580				6180				
			8580				6180				
			8580				6180				
			8580				6180				
			8580				6180				

25% water loss (75% full)	1.435m	**25% water loss (75% full)**	1.323m	**25% water loss (75% full)**	-
50% water loss (50% full)	1.690m	**50% water loss (50% full)**	1.615m	**50% water loss (50% full)**	-
75% water loss (25% full)	1.945m	**75% water loss (25% full)**	1.908m	**75% water loss (25% full)**	-
25% time (seconds)	1613 sec	**25% time (seconds)**	1924 sec	**25% time (seconds)**	-
75% time (seconds)	-	**75% time (seconds)**	-	**75% time (seconds)**	-
Vp 75-25	0.643m³	**Vp 75-25**	0.737m³	**Vp 75-25**	-
as 50 (Actual area from test)	9.710m²	**as 50 (Actual area from test)**	9.335m²	**as 50 (Actual area from test)**	-
tp 75 - 25		**tp 75 - 25**		**tp 75 - 25**	
Soil Infiltration Rate	-	**Soil Infiltration Rate**	-	**Soil Infiltration Rate**	-



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	DATE	16/01/2017
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	DATE	16/01/2017

1 DAY INFILTRATION ASSESSMENT - WORKSHEET

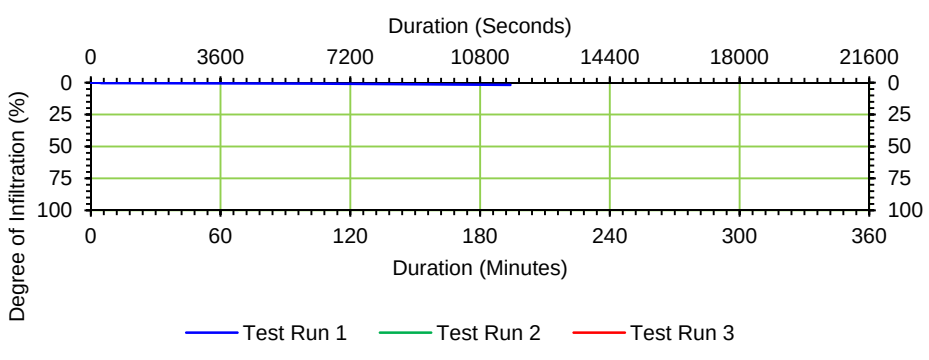
Site: Rail Central
Client: Ashfield Land
Test Location TPG061 **Date of start** 15/09/2016 **Date at end** 15/09/2016

Test Run 1		Test Run 2		Test Run 3	
Pit Dimensions (m)		**Pit Dimensions (m)**		**Pit Dimensions (m)**	
Trial Pit Length (L)	1.900m	Trial Pit Length (L)		Trial Pit Length (L)	
Trial Pit Breadth / Width (B)	0.600m	Trial Pit Breadth / Width (B)		Trial Pit Breadth / Width (B)	
Effective Depth (D)	2.100m	Effective Depth (D)		Effective Depth (D)	
Time at Start of Filling	12.09	Time at Start of Filling		Time at Start of Filling	
Time at End of Filling	12.13	Time at End of Filling		Time at End of Filling	
Depth from Surface to Water (D_{TW})	1.225m	Depth below Surface to Water (D_{TW})		Depth below Surface to Water (D_{TW})	
Water Depth (W_D)	0.875m	Water Depth (W_D)	-	Water Depth (W_D)	-
Maximum Fill Volume (V_W)	0.998m³	Maximum Fill Volume (V_W)	-	Maximum Fill Volume (V_W)	-
Gravel used to backfill Test Pit	No	Gravel used to backfill Test Pit	No	Gravel used to backfill Test Pit	No
Porosity of Gravel Backfill (P_t)	0.300	Porosity of Gravel Backfill (P_t)		Porosity of Gravel Backfill (P_t)	
Corrected Water Volume (V_{WC})	0.998m³	Corrected Water Volume (V_{WC})	-	Corrected Water Volume (V_{WC})	-

Time to soakaway

Time		Depth to water	Duration	Time		Depth to water	Duration	Time		Depth to water	Duration
Day	Time	(m bgl)	Seconds	Day	Time	(m bgl)	Seconds	Day	Time	(m bgl)	Seconds
1	12.130	1.225	0								
1	12.170	1.226	240								
1	12.180	1.228	300								
1	12.280	1.228	900								
1	13.570	1.232	6240								
1	15.270	1.240	11640								
			11640								
			11640								
			11640								
			11640								
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			11640								

25% water loss (75% full)			1.444m	**25% water loss (75% full)**			-	**25% water loss (75% full)**			-
50% water loss (50% full)			1.663m	**50% water loss (50% full)**			-	**50% water loss (50% full)**			-
75% water loss (25% full)			1.881m	**75% water loss (25% full)**			-	**75% water loss (25% full)**			-
25% time (seconds)			-	**25% time (seconds)**			-	**25% time (seconds)**			-
75% time (seconds)			-	**75% time (seconds)**			-	**75% time (seconds)**			-
Vp 75-25			0.499m³	**Vp 75-25**			-	**Vp 75-25**			-
as 50 (Actual area from test)			9.453m²	**as 50 (Actual area from test)**			-	**as 50 (Actual area from test)**			-
tp 75 - 25				**tp 75 - 25**				**tp 75 - 25**			
Soil Infiltration Rate		-		**Soil Infiltration Rate**		-		**Soil Infiltration Rate**		-	



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	DATE	16/01/2017
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	DATE	16/01/2017

1 DAY INFILTRATION ASSESSMENT - WORKSHEET

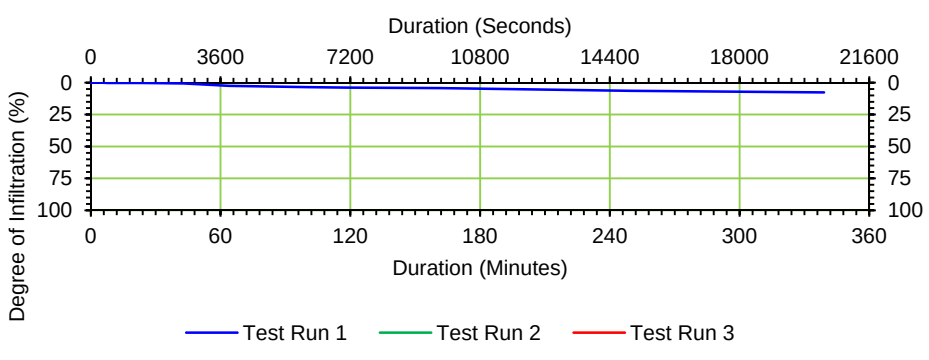
Site: Rail Central
Client: Ashfield Land
Test Location TPG065 **Date of start** 15/09/2016 **Date at end** 15/09/2016

Test Run 1		Test Run 2		Test Run 3	
Pit Dimensions (m)		**Pit Dimensions (m)**		**Pit Dimensions (m)**	
Trial Pit Length (L)	1.500m	Trial Pit Length (L)		Trial Pit Length (L)	
Trial Pit Breadth / Width (B)	0.600m	Trial Pit Breadth / Width (B)		Trial Pit Breadth / Width (B)	
Effective Depth (D)	1.800m	Effective Depth (D)		Effective Depth (D)	
Time at Start of Filling	9.37	Time at Start of Filling		Time at Start of Filling	
Time at End of Filling	9.42	Time at End of Filling		Time at End of Filling	
Depth from Surface to Water (D_{TW})	1.080m	Depth below Surface to Water (D_{TW})		Depth below Surface to Water (D_{TW})	
Water Depth (W_D)	0.720m	Water Depth (W_D)	-	Water Depth (W_D)	-
Maximum Fill Volume (V_W)	0.648m³	Maximum Fill Volume (V_W)	-	Maximum Fill Volume (V_W)	-
Gravel used to backfill Test Pit	No	Gravel used to backfill Test Pit	No	Gravel used to backfill Test Pit	No
Porosity of Gravel Backfill (P_t)	0.300	Porosity of Gravel Backfill (P_t)		Porosity of Gravel Backfill (P_t)	
Corrected Water Volume (V_{WC})	0.648m³	Corrected Water Volume (V_{WC})	-	Corrected Water Volume (V_{WC})	-

Time to soakaway

Time		Depth to water	Duration	Time		Depth to water	Duration	Time		Depth to water	Duration
Day	Time	(m bgl)	Seconds	Day	Time	(m bgl)	Seconds	Day	Time	(m bgl)	Seconds
1	9.420	1.080	0								
1	9.430	1.080	60								
1	9.440	1.080	120								
1	9.450	1.080	180								
1	9.460	1.080	240								
1	9.470	1.080	300								
1	9.500	1.082	480								
1	9.520	1.082	600								
1	10.060	1.082	1440								
1	10.250	1.085	2580								
1	10.460	1.098	3840								
1	11.220	1.105	6000								
1	11.400	1.108	7080								
1	12.230	1.111	9660								
1	13.510	1.126	14940								
1	15.210	1.135	20340								
			20340								
			20340								
			20340								
			20340								
			20340								
			20340								
			20340								
			20340								

25% water loss (75% full)	1.260m	**25% water loss (75% full)**	-	**25% water loss (75% full)**	-
50% water loss (50% full)	1.440m	**50% water loss (50% full)**	-	**50% water loss (50% full)**	-
75% water loss (25% full)	1.620m	**75% water loss (25% full)**	-	**75% water loss (25% full)**	-
25% time (seconds)	-	**25% time (seconds)**	-	**25% time (seconds)**	-
75% time (seconds)	-	**75% time (seconds)**	-	**75% time (seconds)**	-
Vp 75-25	0.324m³	**Vp 75-25**	-	**Vp 75-25**	-
as 50 (Actual area from test)	6.948m²	**as 50 (Actual area from test)**	-	**as 50 (Actual area from test)**	-
tp 75 - 25		**tp 75 - 25**		**tp 75 - 25**	
Soil Infiltration Rate	-	**Soil Infiltration Rate**	-	**Soil Infiltration Rate**	-



Form completed by		
Tested By	PRINT	RB
	SIGN	
	DATE	15/09/2016
Calculated By	PRINT	RB
	SIGN	
	DATE	16/01/2017
Checked by	PRINT	IG
	SIGN	
	DATE	16/01/2017

Appendix C

Geotechnical Test Results, SPT Depth Plots and Undrained Shear Strength Depth Plots

TEST CERTIFICATE

Determination of California Bearing Ratio

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

4041

Tested in Accordance with BS 1377-4: 1990: Clause 7

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	07/09/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

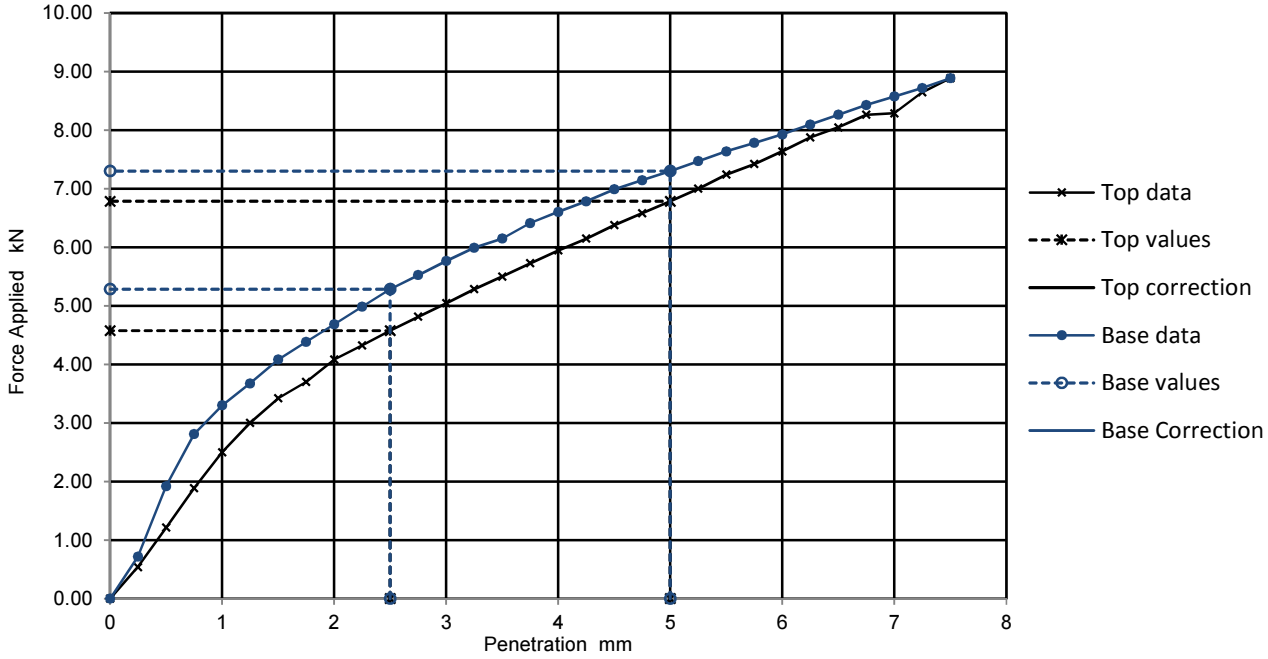
Test Results:

Laboratory Reference:	628122	Depth Top [m]:	0.5
Hole No.:	TPL010	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B

Specimen Preparation

Condition	Remoulded			Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer			Period of soaking	days
				Time to surface	days
Sample Description:	Brown slightly clayey SAND with rootlets			Amount of swell recorded	mm
Material retained on 20mm sieve removed		0	%	Dry density after soaking	Mg/m3
Initial Specimen details	Bulk density	1.99	Mg/m3	Surcharge applied	8 kg
	Dry density	1.85	Mg/m3		4.8 kPa
	Moisture content	7.6	%		

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	35.0	34.0	35.0	37.0	7.5
BASE	No	40.0	37.0	40.0		7.1

Remarks:

Test/ Specimen specific remarks:

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Geotechnical Manager

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of California Bearing Ratio

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

Tested in Accordance with BS 1377-4: 1990: Clause 7

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	31/08/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

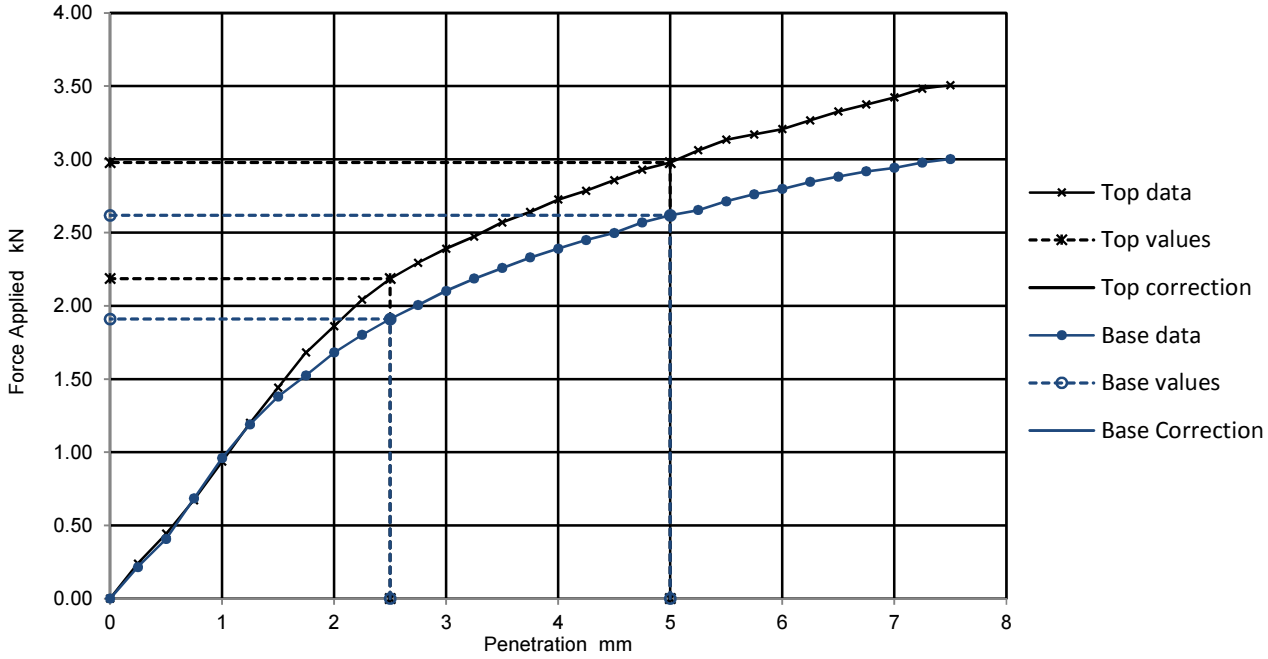
Test Results:

Laboratory Reference:	628131	Depth Top [m]:	1.5
Hole No.:	TPT022	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B

Specimen Preparation

Condition	Remoulded			Soaking details	Not soaked	
Details	Recompacted with specified standard effort using 2.5kg rammer			Period of soaking		days
				Time to surface		days
Sample Description:	Dark brown gravelly clayey SAND			Amount of swell recorded		mm
Material retained on 20mm sieve removed		2	%	Dry density after soaking		Mg/m3
Initial Specimen details	Bulk density	1.91	Mg/m3	Surcharge applied	8	kg
	Dry density	1.54	Mg/m3		4.9	kPa
	Moisture content	24.0	%			

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	17.0	15.0	17.0	16.0	27.7
BASE	No	14.0	13.0	14.0		29.1

Remarks:

Test/ Specimen specific remarks:

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Geotechnical Manager

Date Reported: 29/09/2016

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Determination of California Bearing Ratio

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

4041

Tested in Accordance with BS 1377-4: 1990: Clause 7

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	05/09/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

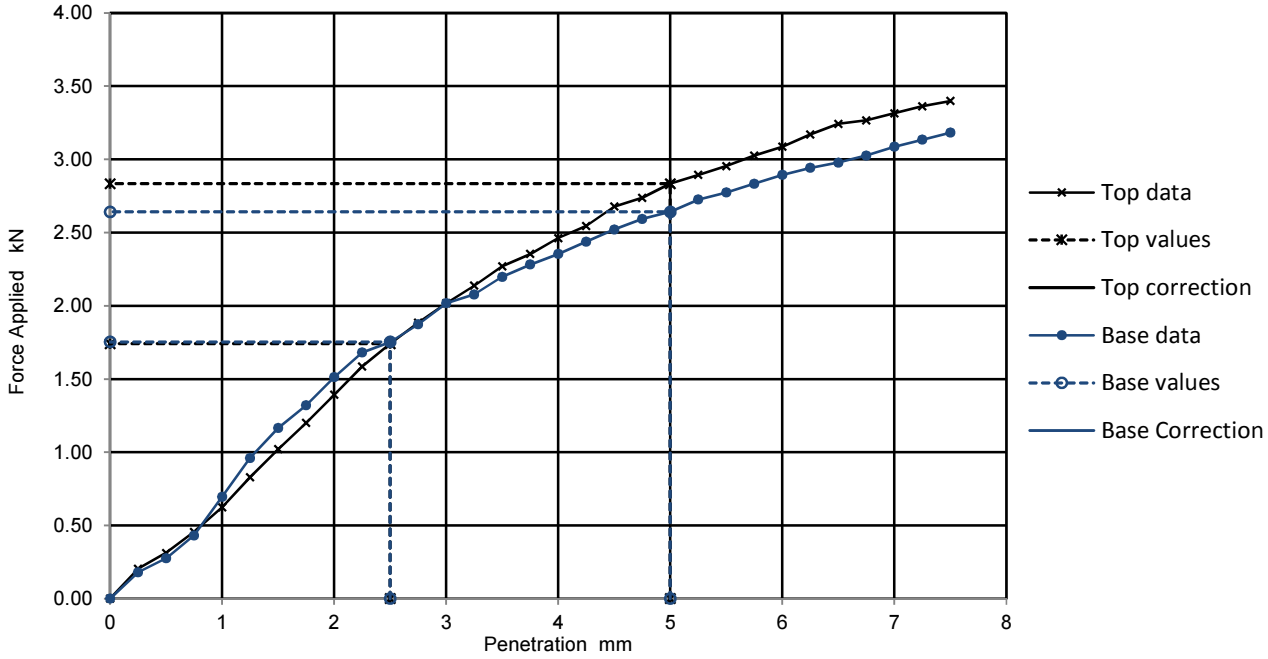
Test Results:

Laboratory Reference:	628135	Depth Top [m]:	0.6
Hole No.:	TPA004	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B

Specimen Preparation

Condition	Remoulded			Soaking details	Not soaked	
Details	Recompacted with specified standard effort using 2.5kg rammer			Period of soaking		days
				Time to surface		days
Sample Description:	Yellowish brown gravelly sandy CLAY with rootlets			Amount of swell recorded		mm
Material retained on 20mm sieve removed		15	%	Dry density after soaking		Mg/m3
Initial Specimen details	Bulk density	2.31	Mg/m3	Surcharge applied	8	kg
	Dry density	2.02	Mg/m3		4.8	kPa
	Moisture content	14.1	%			

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	13.0	14.0	14.0	14.0	13.9
BASE	No	13.0	13.0	13.0		14.3

Remarks:

Test/ Specimen specific remarks:

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Geotechnical Manager

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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Determination of California Bearing Ratio

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

4041

Tested in Accordance with BS 1377-4: 1990: Clause 7

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	04/09/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

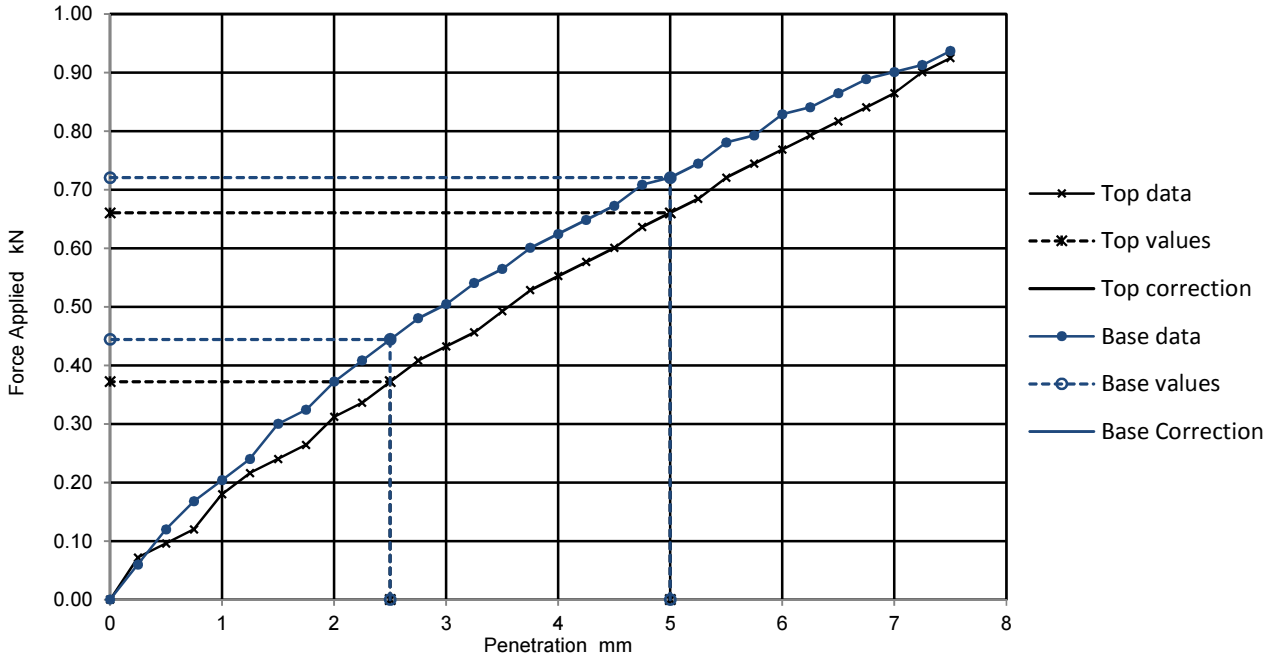
Test Results:

Laboratory Reference:	628140	Depth Top [m]:	0.6
Hole No.:	TPA024	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B

Specimen Preparation

Condition	Remoulded			Soaking details	Not soaked	
Details	Recompacted with specified standard effort using 2.5kg rammer			Period of soaking		days
				Time to surface		days
Sample Description:	Yellowish brown gravelly clayey SAND with rootlets			Amount of swell recorded		mm
Material retained on 20mm sieve removed		12	%	Dry density after soaking		Mg/m3
Initial Specimen details	Bulk density	2.06	Mg/m3	Surcharge applied	8	kg
	Dry density	1.75	Mg/m3		4.8	kPa
	Moisture content	17.8	%			

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	2.8	3.3	3.3	3.5	17.7
BASE	No	3.4	3.6	3.6		17.8

Remarks:

Test/ Specimen specific remarks:

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Geotechnical Manager

Date Reported: 29/09/2016

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Watford Herts WD18 8YS

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Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	04/09/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

Test Results:

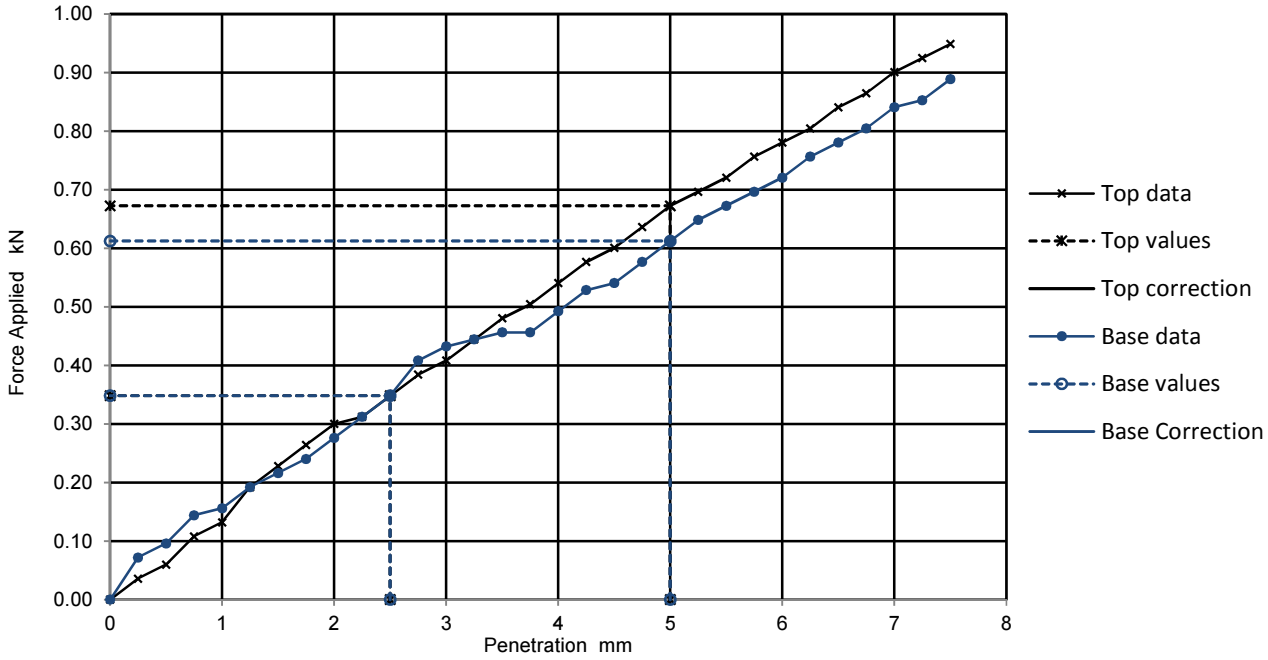
Laboratory Reference:	628142	Depth Top [m]:	1.3
Hole No.:	TPA028	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B

Specimen Preparation

Condition	Remoulded	Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer	Period of soaking	days
		Time to surface	days
Sample Description:	Brown slightly gravelly clayey fine to coarse SAND	Amount of swell recorded	mm
Material retained on 20mm sieve removed	0 %	Dry density after soaking	Mg/m3

Initial Specimen details	Bulk density	2.14	Mg/m3	Surcharge applied	8 kg
	Dry density	1.83	Mg/m3		4.9 kPa
	Moisture content	17.2	%		

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	2.6	3.4	3.4	3.2	16.4
BASE	No	2.6	3.1	3.1		16.6

Remarks:

Test/ Specimen specific remarks:

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Geotechnical Manager

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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i2 Analytical Ltd
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Croxley Green Business Park
Watford Herts WD18 8YS

4041

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Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	25/08/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

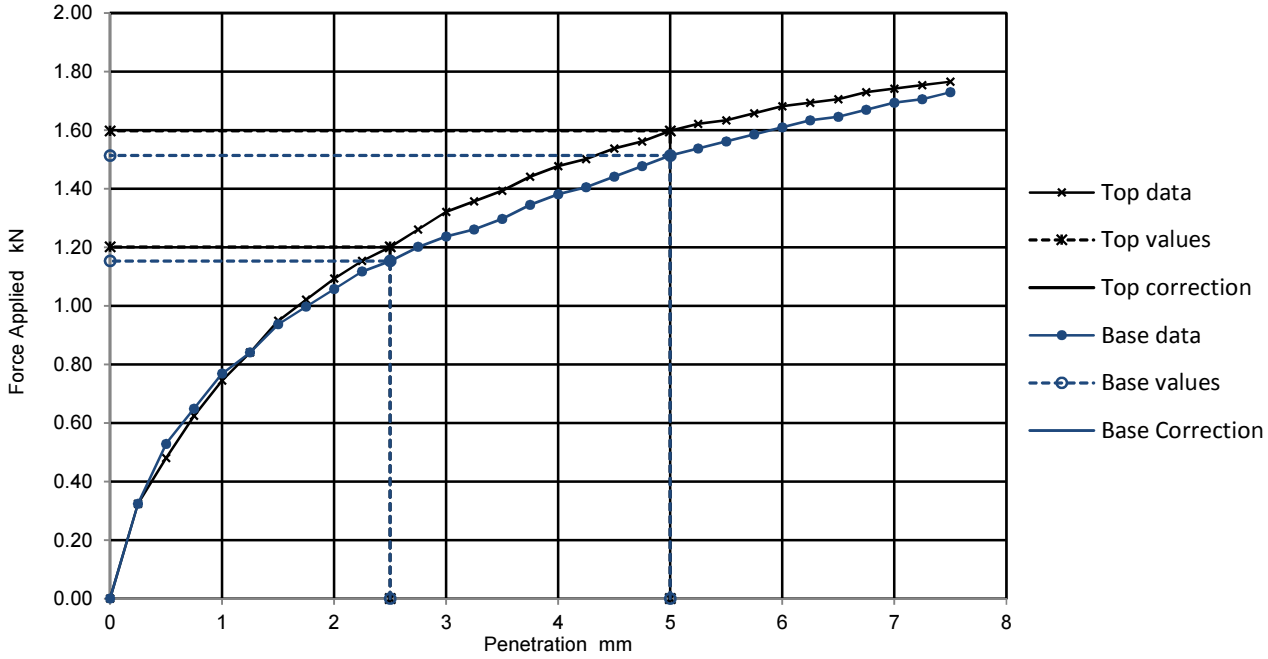
Test Results:

Laboratory Reference:	628151	Depth Top [m]:	1
Hole No.:	TPG062	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B

Specimen Preparation

Condition	Remoulded			Soaking details	Not soaked	
Details	Recompacted with specified standard effort using 2.5kg rammer			Period of soaking		days
				Time to surface		days
Sample Description:	Greyish brown slightly gravelly sandy CLAY			Amount of swell recorded		mm
Material retained on 20mm sieve removed		0	%	Dry density after soaking		Mg/m3
Initial Specimen details	Bulk density	2.04	Mg/m3	Surcharge applied	8	kg
	Dry density	1.67	Mg/m3		4.9	kPa
	Moisture content	22.3	%			

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	9.1	8.0	9.1	8.9	21.1
BASE	No	8.7	7.6	8.7		20.9

Remarks:

Test/ Specimen specific remarks:

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Geotechnical Manager

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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Determination of California Bearing Ratio

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

Tested in Accordance with BS 1377-4: 1990: Clause 7

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number: Date Sampled: Date Received:	16-27560 09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

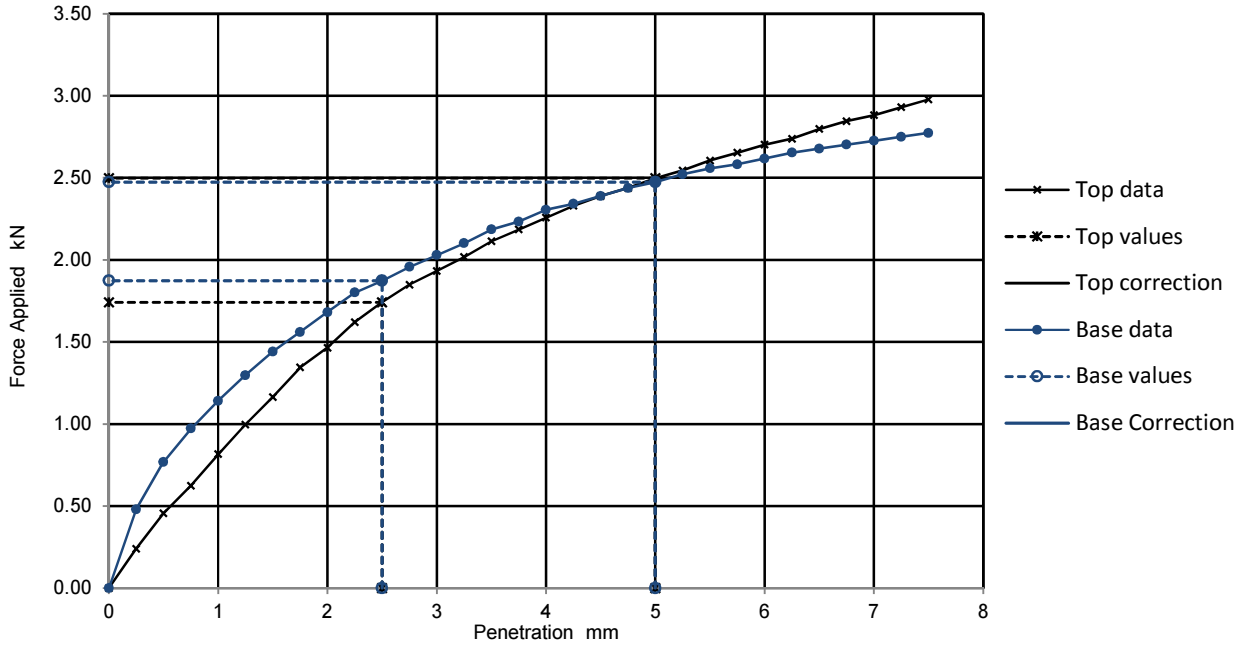
Test Results:

Laboratory Reference:	628164	Depth Top [m]:	0.7
Hole No.:	TPG056	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B

Specimen Preparation

Condition	Remoulded			Soaking details	Not soaked	
Details	Recompacted with specified standard effort using 2.5kg rammer			Period of soaking		days
				Time to surface		days
Sample Description:	Yellowish brown slightly gravelly sandy CLAY with rootlets			Amount of swell recorded		mm
Material retained on 20mm sieve removed		0	%	Dry density after soaking		Mg/m3
Initial Specimen details	Bulk density	2.01	Mg/m3	Surcharge applied	8	kg
	Dry density	1.66	Mg/m3		4.9	kPa
	Moisture content	21.4	%			

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	13.0	12.0	13.0	14.0	20.6
BASE	No	14.0	12.0	14.0		20.4

Remarks:

Test/ Specimen specific remarks:

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Geotechnical Manager

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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Determination of California Bearing Ratio

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

4041

Tested in Accordance with BS 1377-4: 1990: Clause 7

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number: Date Sampled: Date Received:	16-27560 09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

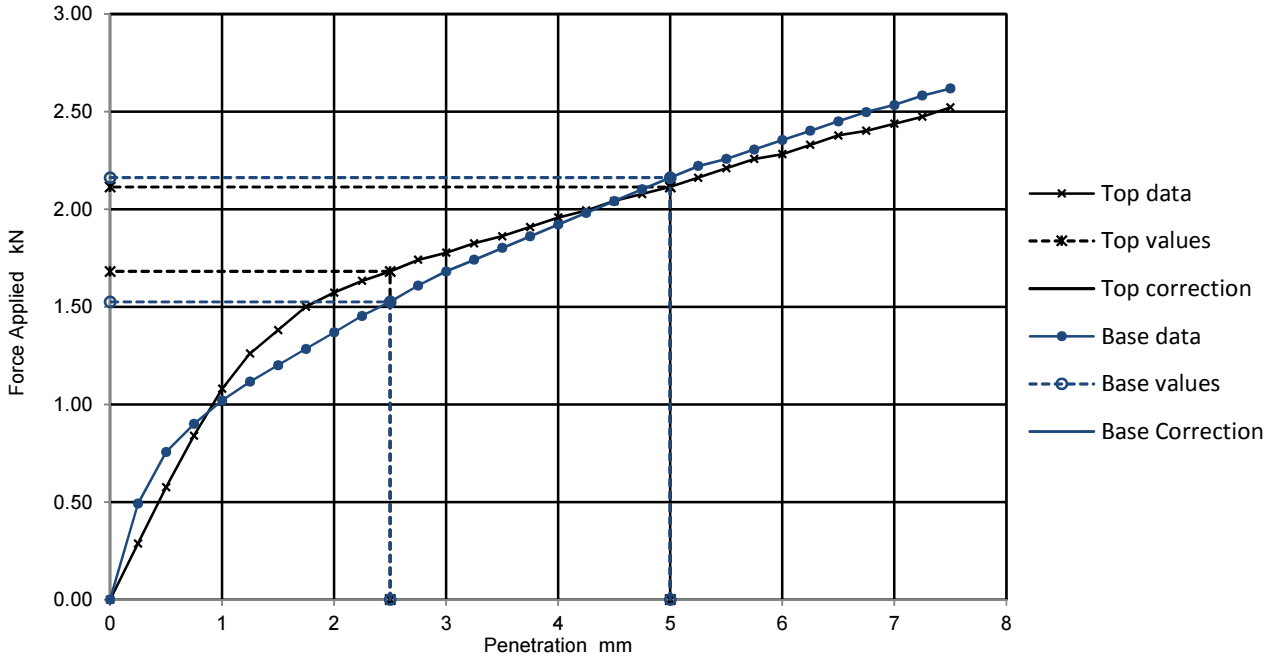
Test Results:

Laboratory Reference:	628169	Depth Top [m]:	0.75
Hole No.:	TPRT003	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B

Specimen Preparation

Condition	Remoulded			Soaking details	Not soaked	
Details	Recompacted with specified standard effort using 2.5kg rammer			Period of soaking		days
				Time to surface		days
Sample Description:	Greyish brown sandy CLAY			Amount of swell recorded		mm
Material retained on 20mm sieve removed		0	%	Dry density after soaking		Mg/m3
Initial Specimen details	Bulk density	1.82	Mg/m3	Surcharge applied	8	kg
	Dry density	1.49	Mg/m3		4.9	kPa
	Moisture content	22.4	%			

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	13.0	11.0	13.0	12.0	21.8
BASE	No	12.0	11.0	12.0		22.1

Remarks:

Test/ Specimen specific remarks:

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Geotechnical Manager

Date Reported: 29/09/2016

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Determination of California Bearing Ratio

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

4041

Tested in Accordance with BS 1377-4: 1990: Clause 7

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	07/09/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

Test Results:

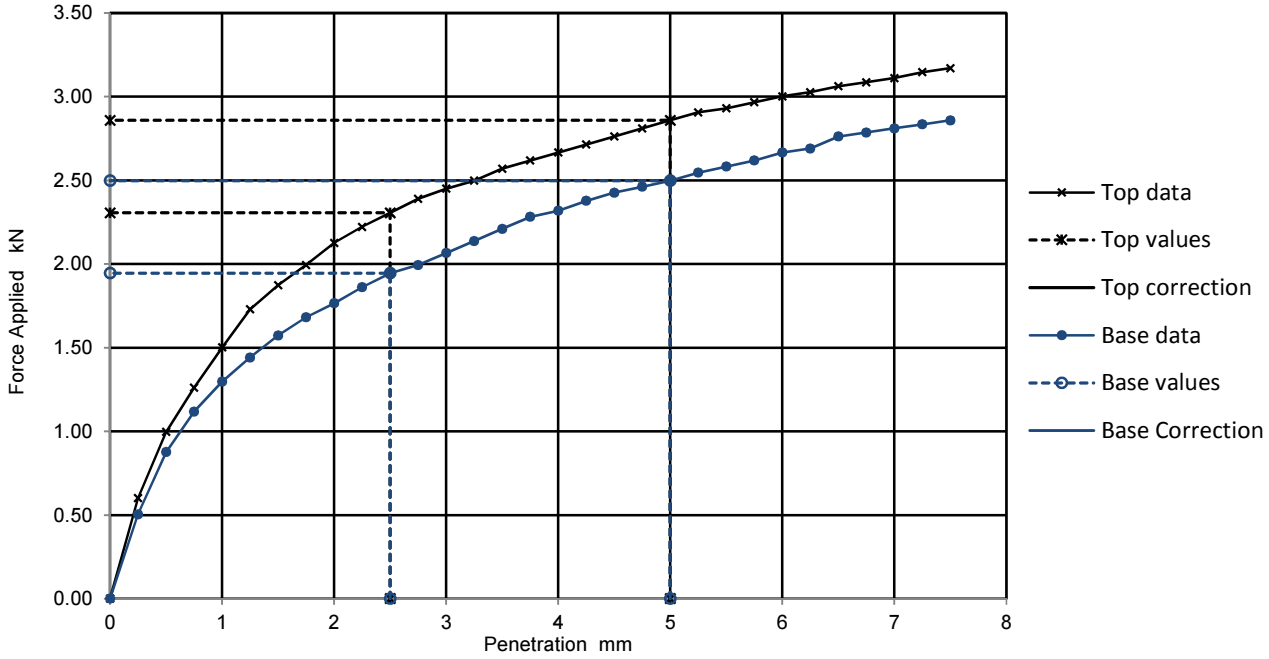
Laboratory Reference:	628179	Depth Top [m]:	1.2
Hole No.:	TPL006	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B

Specimen Preparation

Condition	Remoulded	Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer	Period of soaking	days
		Time to surface	days
Sample Description:	Yellowish brown slightly sandy CLAY with rootlets	Amount of swell recorded	mm
Material retained on 20mm sieve removed	0 %	Dry density after soaking	Mg/m3

Initial Specimen details	Bulk density	1.84	Mg/m3	Surcharge applied	8 kg
	Dry density	1.46	Mg/m3		4.9 kPa
	Moisture content	26.1	%		

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	17.0	14.0	17.0	16.0	26.2
BASE	No	15.0	12.0	15.0		26.1

Remarks:

Test/ Specimen specific remarks:

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Geotechnical Manager

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland."

TEST CERTIFICATE

Determination of California Bearing Ratio

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

4041

Tested in Accordance with BS 1377-4: 1990: Clause 7

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	07/09/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

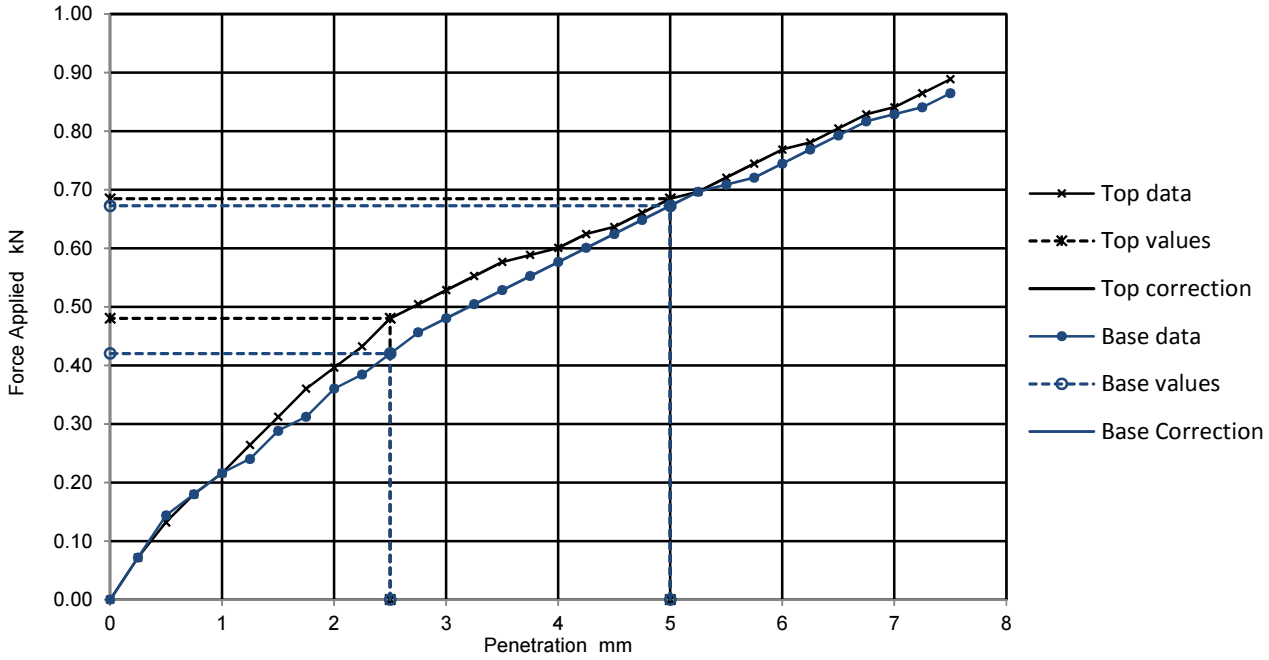
Test Results:

Laboratory Reference:	628182	Depth Top [m]:	3.1
Hole No.:	TPA024	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B

Specimen Preparation

Condition	Remoulded			Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer			Period of soaking	days
				Time to surface	days
Sample Description:	Dark grey sandy CLAY			Amount of swell recorded	mm
Material retained on 20mm sieve removed		0	%	Dry density after soaking	Mg/m3
Initial Specimen details	Bulk density	2.00	Mg/m3	Surcharge applied	kg
	Dry density	1.63	Mg/m3		kPa
	Moisture content	22.4	%		

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	3.6	3.4	3.6	3.5	22.3
BASE	No	3.2	3.4	3.4		22.3

Remarks:

Test/ Specimen specific remarks:

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Geotechnical Manager

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Light Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

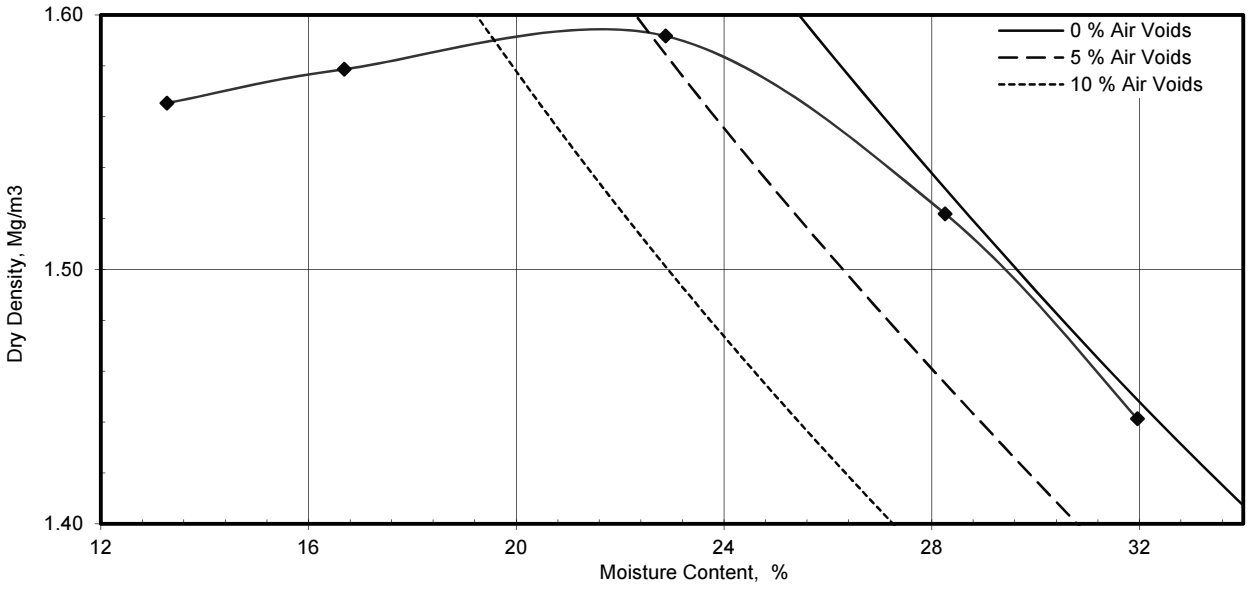
UKAS TESTING 4041

Tested in accordance with BS 1377-4:1990: Clause 3.3 using 2.5kg[light] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	30/08/2016
		Date Received:	09/09/2016
		Date Tested:	22/09/2016
Contact:	Richard Brown	Sampled By:	RB/AO/WS
Site Name:	Rail Centre		
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference:	628130		
Hole No.:	TPT021	Depth Top [m]:	1.8
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Greyish brown slightly sandy gravelly CLAY	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	2
Particle Density - Measured using gas jar	Mg/m³	2.70

Maximum Dry Density	Mg/m³	**1.59**

Optimum Moisture Content	%	**22**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Light Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

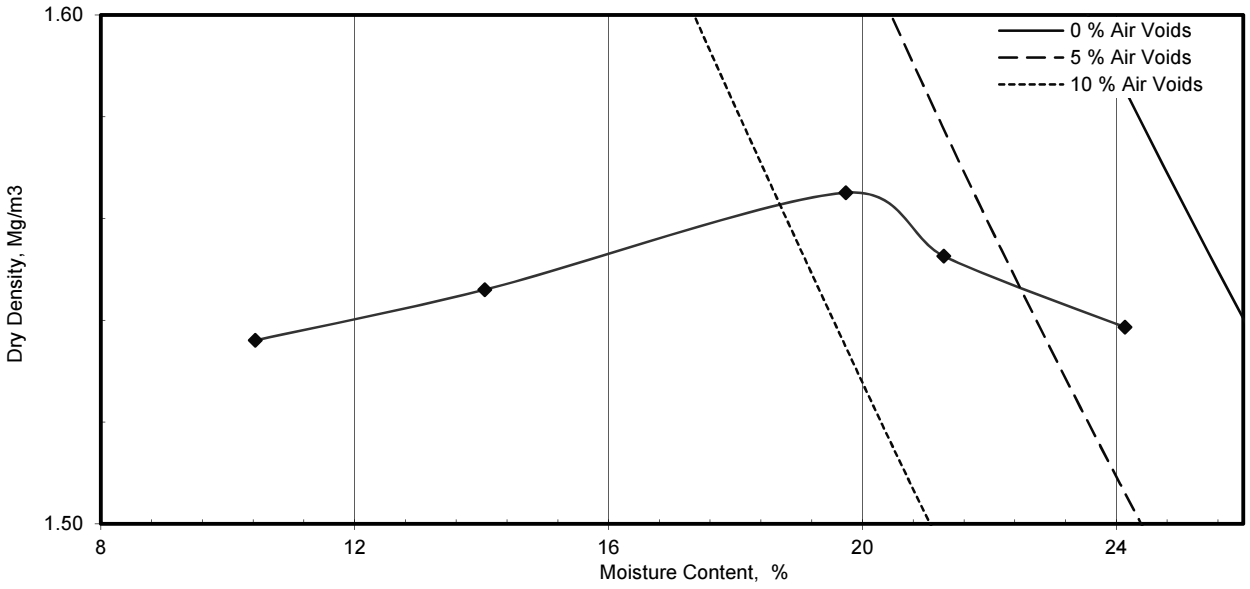
UKAS TESTING 4041

Tested in accordance with BS 1377-4:1990: Clause 3.3 using 2.5kg[light] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	23/08/2016
		Date Received:	09/09/2016
		Date Tested:	22/09/2016
Contact:	Richard Brown	Sampled By:	RB/AO/WS
Site Name:	Rail Centre		
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference:	628137		
Hole No.:	TPA008	Depth Top [m]:	0.35
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Brown slightly gravelly slightly sandy CLAY	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	2.57

Maximum Dry Density	Mg/m³	**1.57**

Optimum Moisture Content	%	**20**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Light Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

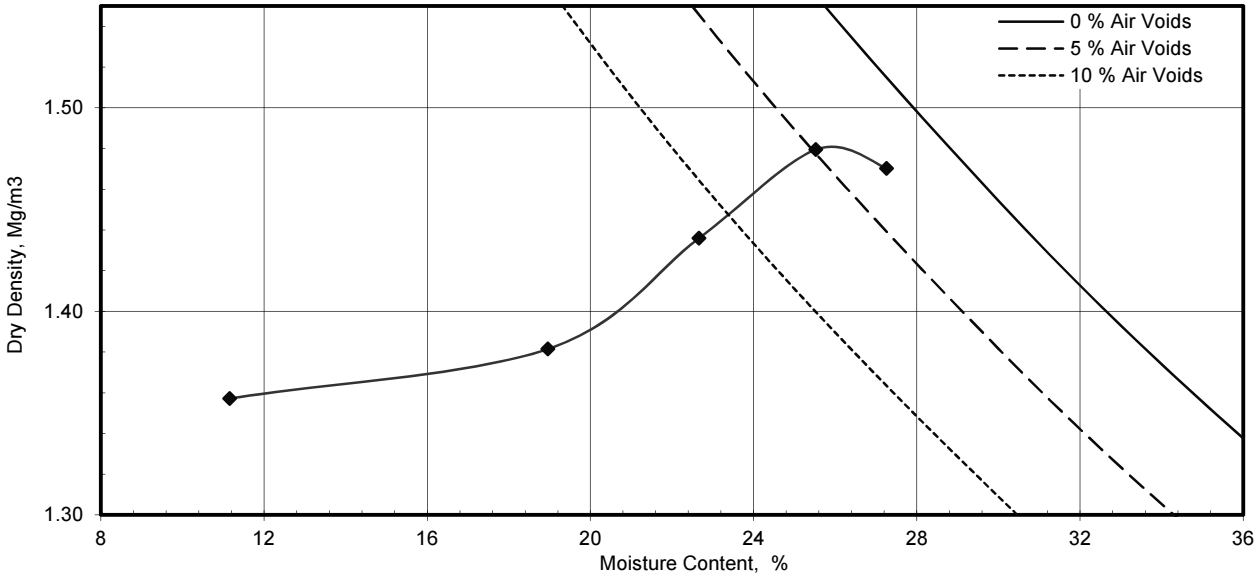
UKAS TESTING 4041

Tested in accordance with BS 1377-4:1990: Clause 3.3 using 2.5kg[light] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	26/08/2016
		Date Received:	09/09/2016
		Date Tested:	22/09/2016
Contact:	Richard Brown	Sampled By:	RB/AO/WS
Site Name:	Rail Centre		
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference:	628145		
Hole No.:	TPR003	Depth Top [m]:	1.1
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Grey sandy CLAY with rootlets	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	2.58

Maximum Dry Density	Mg/m³	**1.48**

Optimum Moisture Content	%	**26**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Light Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

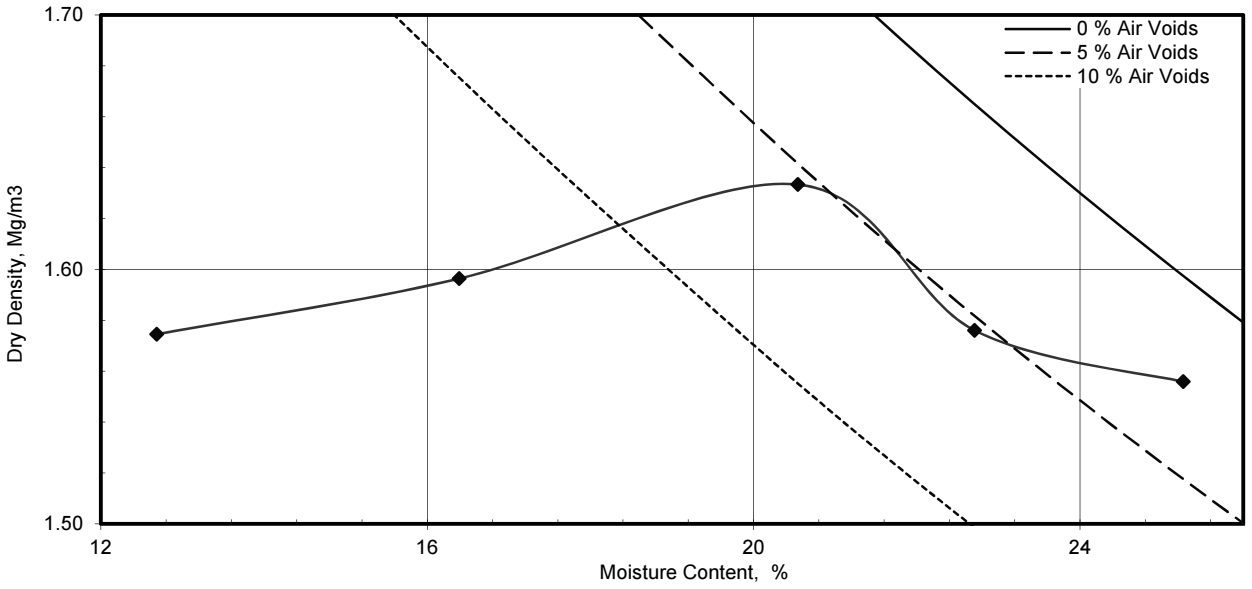
UKAS TESTING 4041

Tested in accordance with BS 1377-4:1990: Clause 3.3 using 2.5kg[light] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	Not Given
		Date Received:	09/09/2016
		Date Tested:	23/09/2016
Contact:	Richard Brown	Sampled By:	RB/AO/WS
Site Name:	Rail Centre		
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference:	628160		
Hole No.:	TPA012	Depth Top [m]:	1.8
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Greyish brown sandy CLAY	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	2.68

Maximum Dry Density	Mg/m³	**1.63**

Optimum Moisture Content	%	**21**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Light Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

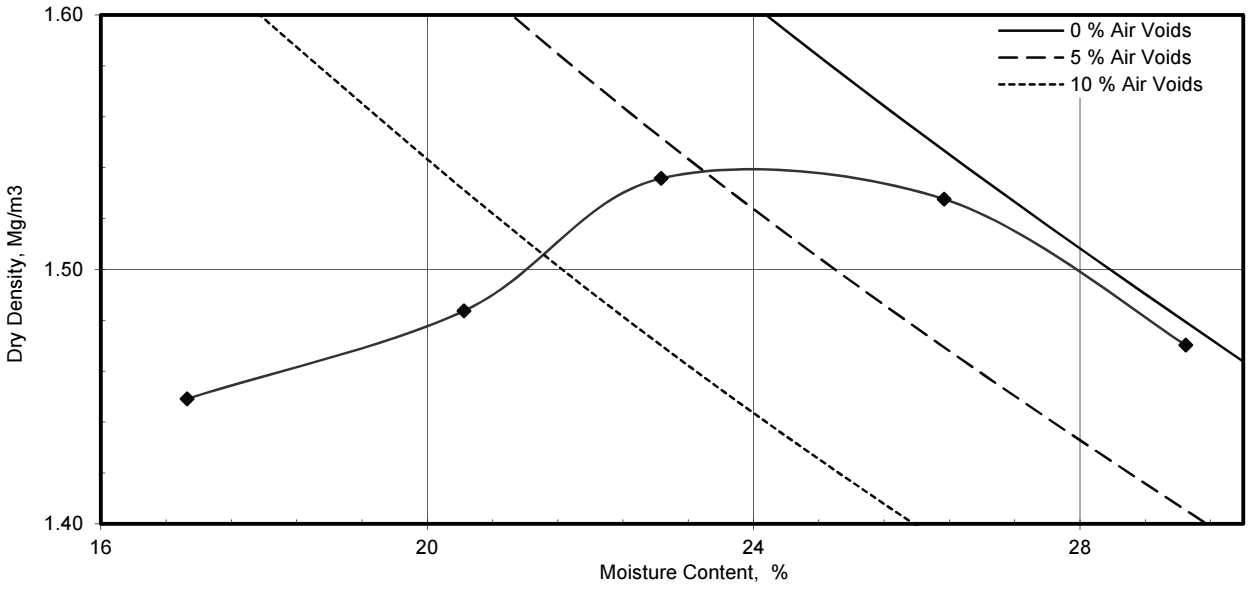
UKAS TESTING 4041

Tested in accordance with BS 1377-4:1990: Clause 3.3 using 2.5kg[light] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	Not Given
		Date Received:	09/09/2016
		Date Tested:	23/09/2016
Contact:	Richard Brown	Sampled By:	RB/AO/WS
Site Name:	Rail Centre		
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference:	628166		
Hole No.:	TPT002	Depth Top [m]:	2.8
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Greyish brown sandy CLAY	Sample Type:	B



Preparation		-2146826273
Mould Type		1 Litre
Samples Used		
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	2.61

Maximum Dry Density	Mg/m³	**1.54**

Optimum Moisture Content	%	**24**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Light Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

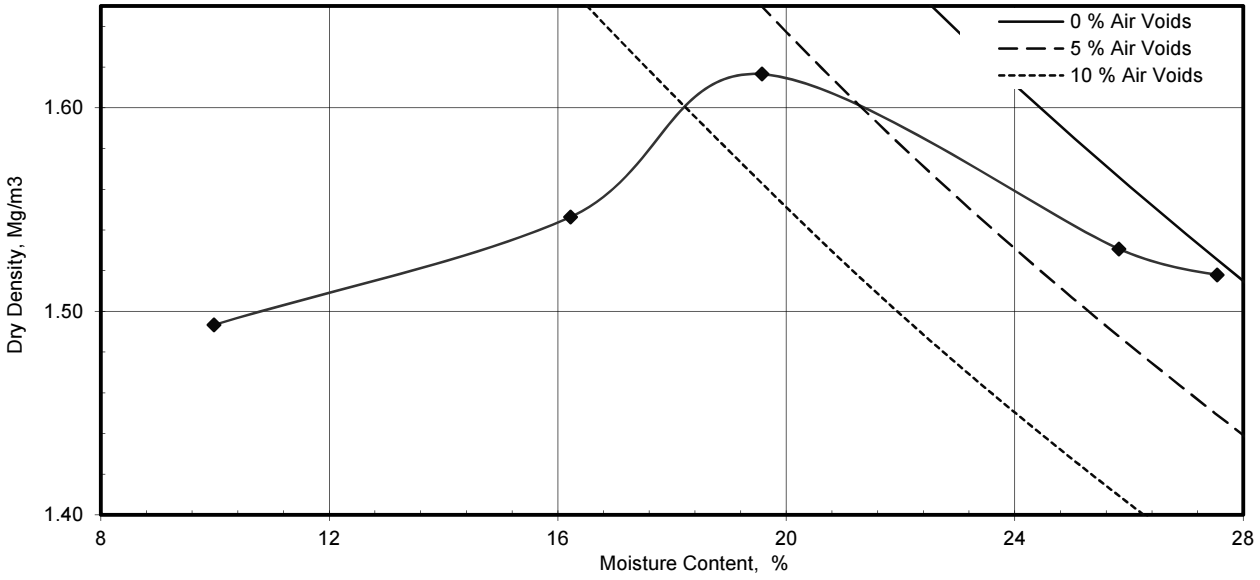
UKAS TESTING 4041

Tested in accordance with BS 1377-4:1990: Clause 3.3 using 2.5kg[light] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	Not Given
		Date Received:	09/09/2016
		Date Tested:	23/09/2016
Contact:	Richard Brown	Sampled By:	RB/AO/WS
Site Name:	Rail Centre		
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference:	628172		
Hole No.:	TPG011	Depth Top [m]:	2.8
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Greyish brown sandy CLAY	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	2.63

Maximum Dry Density	Mg/m³	**1.62**

Optimum Moisture Content	%	**20**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Heavy Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

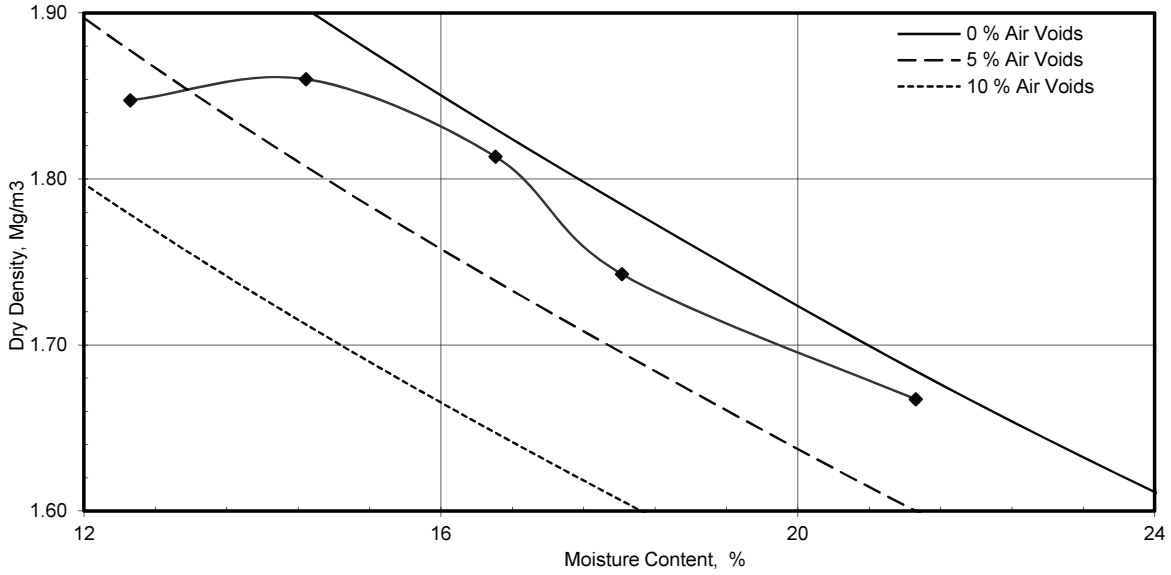
UKAS TESTING 4041

Tested in accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	07/09/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST REPORTS

Laboratory Reference:	628121		
Hole No.:	TPL008	Depth Top [m]:	2.5
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Brownish grey slightly gravwelly slightly sandy CLAY with fragments of chalk	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	1
Particle Density - Measured using gas jar	Mg/m³	2.63

Maximum Dry Density	Mg/m³	**1.86**

Optimum Moisture Content	%	**14**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Heavy Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

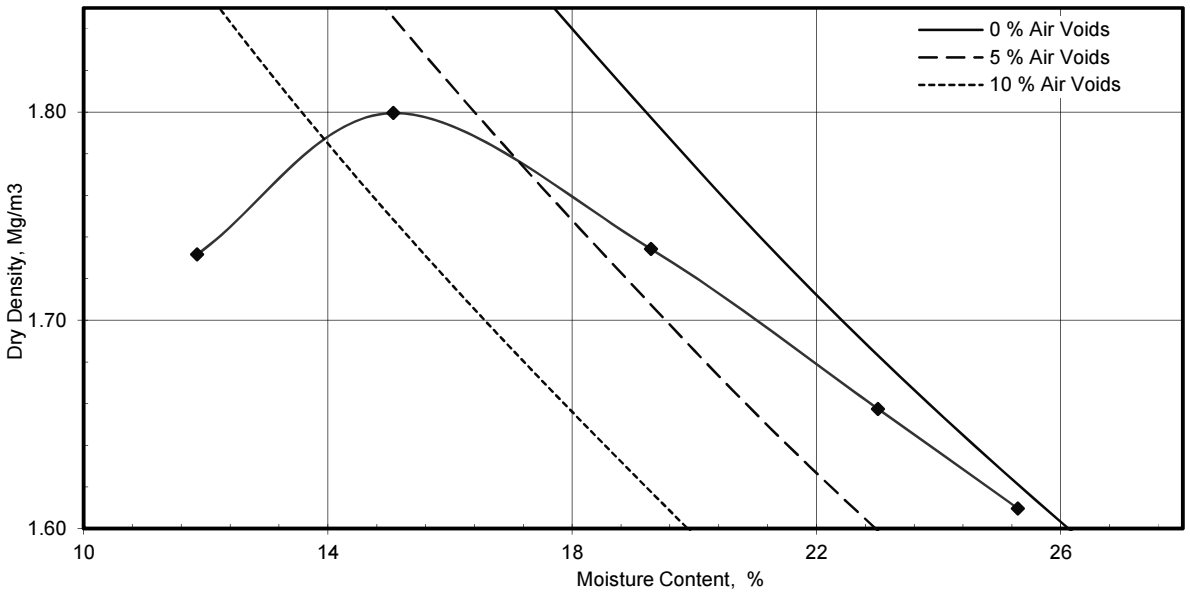
Environmental Science

Tested in accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	01/09/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	26/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST REPORTS

Laboratory Reference:	628128		
Hole No.:	TPT019	Depth Top [m]:	1.5
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Multicolour slightly sandy CLAY	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	3
Particle Density - Measured using gas jar	Mg/m³	2.75

Maximum Dry Density	Mg/m³	**1.80**

Optimum Moisture Content	%	**15**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Heavy Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

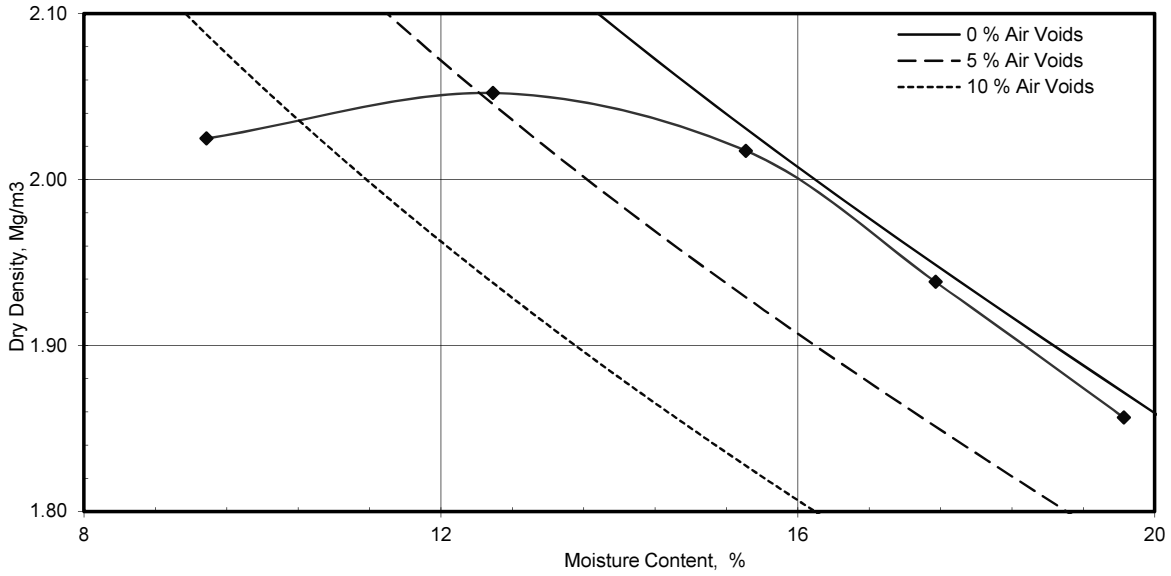
UKAS TESTING 4041

Tested in accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	22/08/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	26/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST REPORTS

Laboratory Reference:	628136		
Hole No.:	TPA007	Depth Top [m]:	1.4
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Light grey CLAY with thick laminae of yellowish brown gravelly sand	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	1
Particle Density - Measured using gas jar	Mg/m³	2.96

Maximum Dry Density	Mg/m³	**2.05**

Optimum Moisture Content	%	**13**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Heavy Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

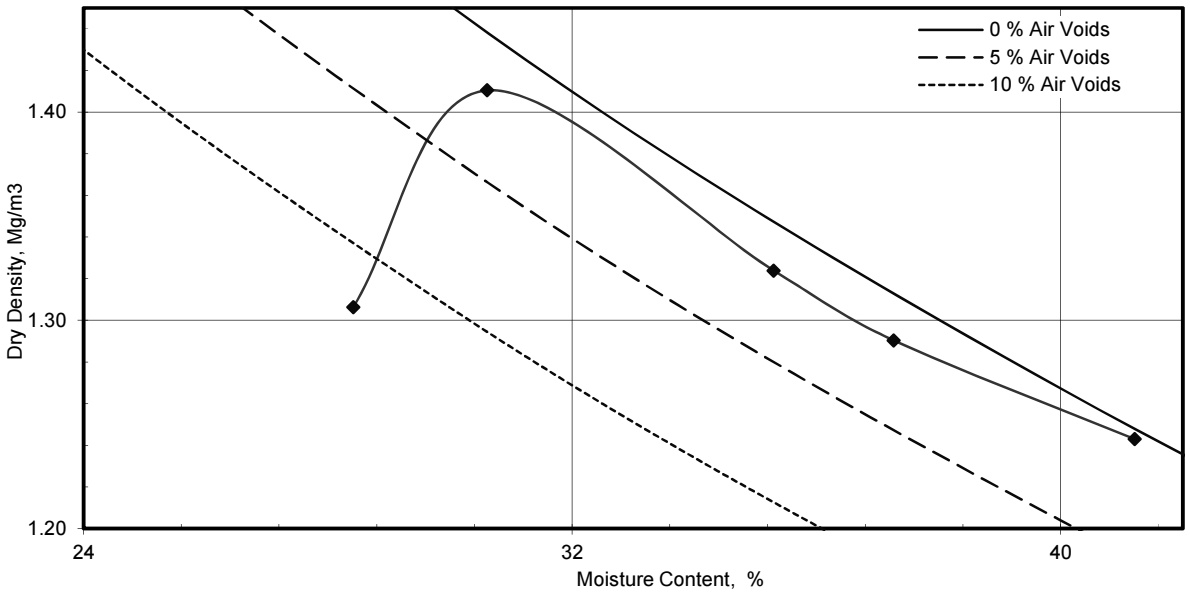
Environmental Science

Tested in accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	04/09/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	27/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST REPORTS

Laboratory Reference:	628141		
Hole No.:	TPA025	Depth Top [m]:	0.8
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Yellowish brown CLAY	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	2.57

Maximum Dry Density	Mg/m³	**1.41**

Optimum Moisture Content	%	**31**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Heavy Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

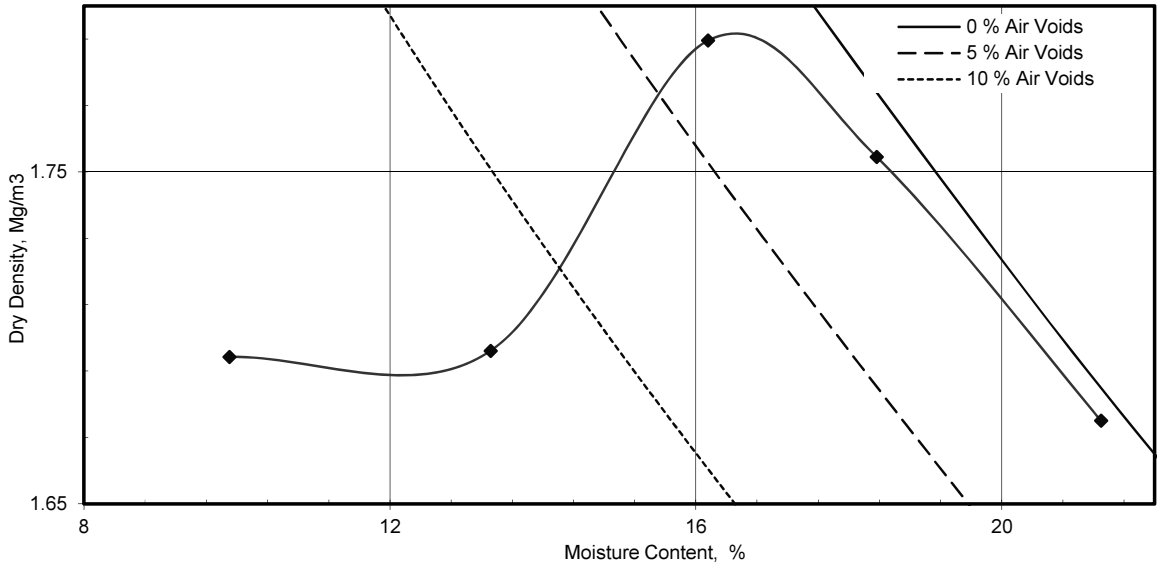
UKAS TESTING 4041

Tested in accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	26/08/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST REPORTS

Laboratory Reference:	628146		
Hole No.:	TPR004	Depth Top [m]:	1.6
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Yellowish brown to grey slightly gravelly CLAY with fragments of chalk	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	2
Particle Density - Measured using gas jar	Mg/m³	2.63

Maximum Dry Density	Mg/m³	**1.79**

Optimum Moisture Content	%	**16**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Heavy Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

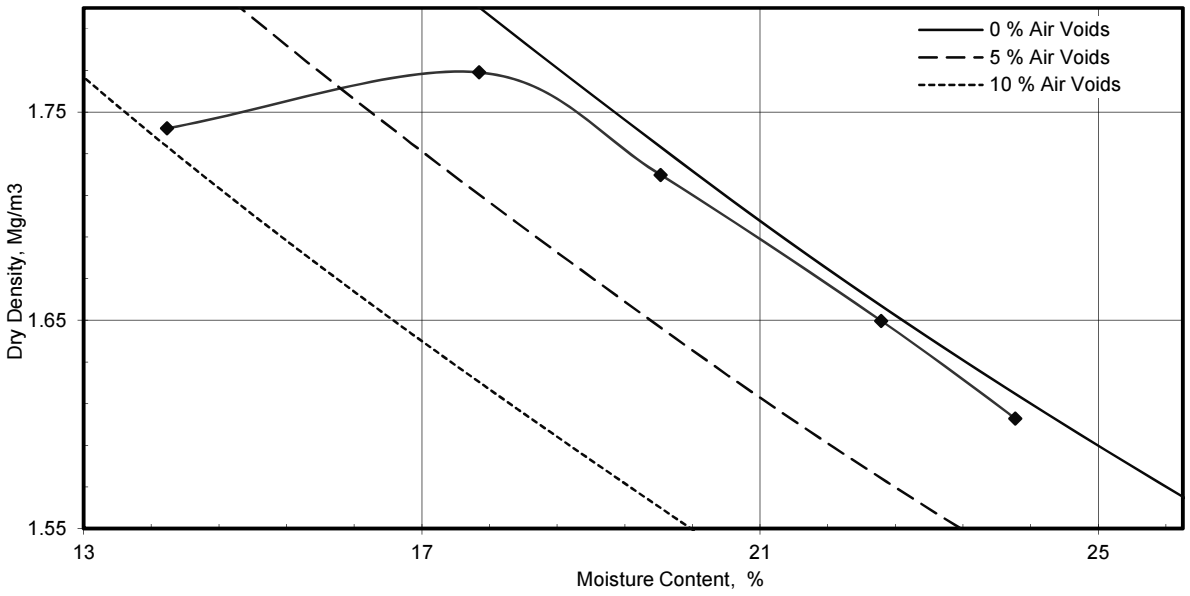
Environmental Science

Tested in accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	26/08/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	27/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST REPORTS

Laboratory Reference:	628149		
Hole No.:	TPG033	Depth Top [m]:	2.7
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Grey CLAY	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	2.64

Maximum Dry Density	Mg/m³	**1.77**

Optimum Moisture Content	%	**18**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Heavy Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

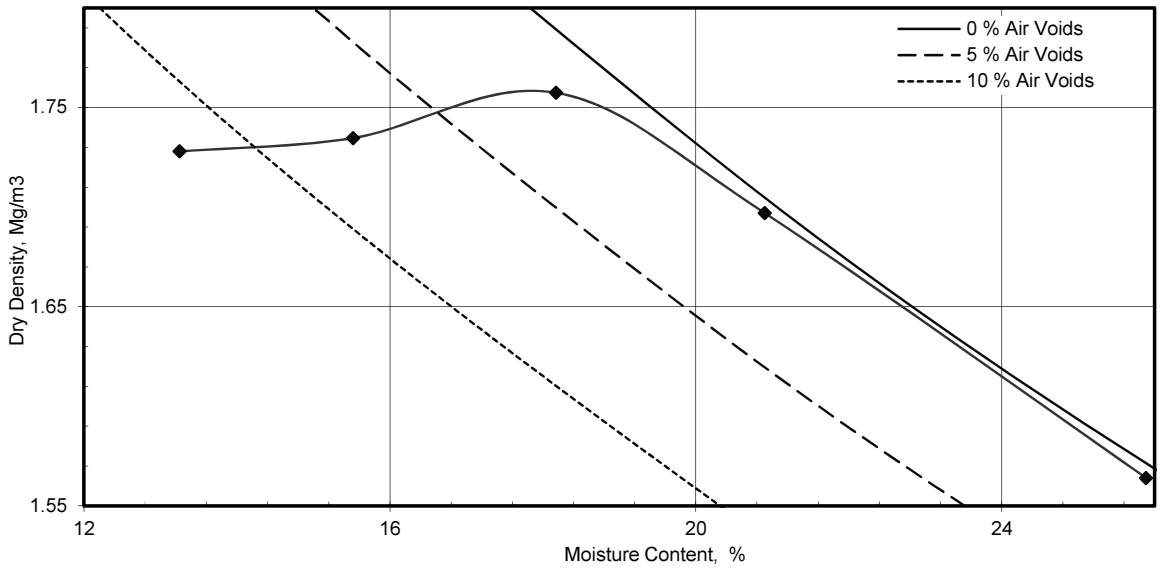
4041

Tested in accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	Not Given
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	27/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST REPORTS

Laboratory Reference:	628157		
Hole No.:	TPG025	Depth Top [m]:	2.3
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Grey to brownish grey CLAY with fragments of gypsum crystals	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	1
Particle Density - Measured using gas jar	Mg/m³	2.65

Maximum Dry Density	Mg/m³	**1.76**

Optimum Moisture Content	%	**18**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Heavy Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

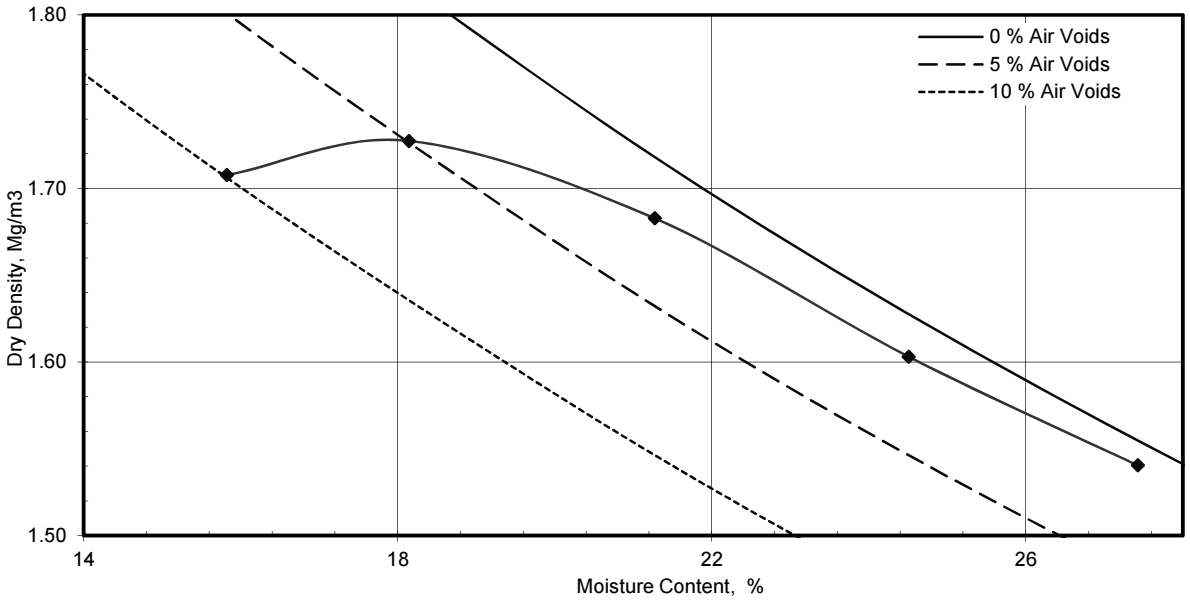
Environmental Science

Tested in accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	Not Given
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	27/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST REPORTS

Laboratory Reference:	628158		
Hole No.:	TPT008	Depth Top [m]:	1.6
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Grey to brownish grey CLAY	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	2.71

Maximum Dry Density	Mg/m³	**1.73**

Optimum Moisture Content	%	**18**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Heavy Compaction

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7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

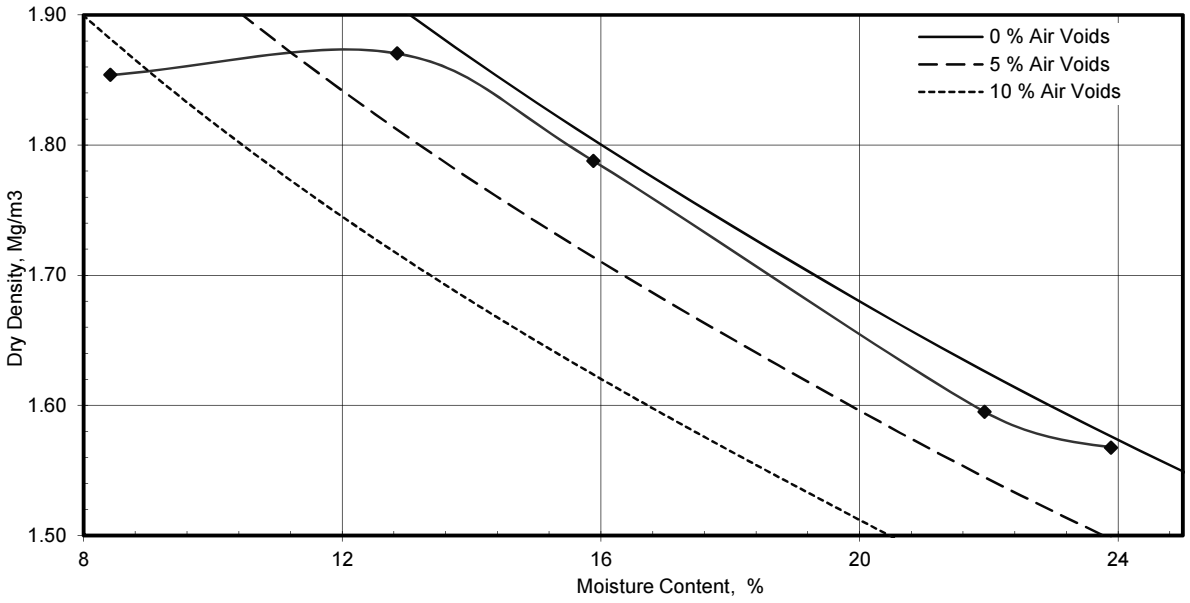
Environmental Science

Tested in accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	Not Given
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	27/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST REPORTS

Laboratory Reference:	628165		
Hole No.:	TPL002	Depth Top [m]:	0.7
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Yellowish brown CLAY with grass	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	2
Particle Density - Measured using gas jar	Mg/m³	2.53

Maximum Dry Density	Mg/m³	**1.87**

Optimum Moisture Content	%	**12**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Heavy Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

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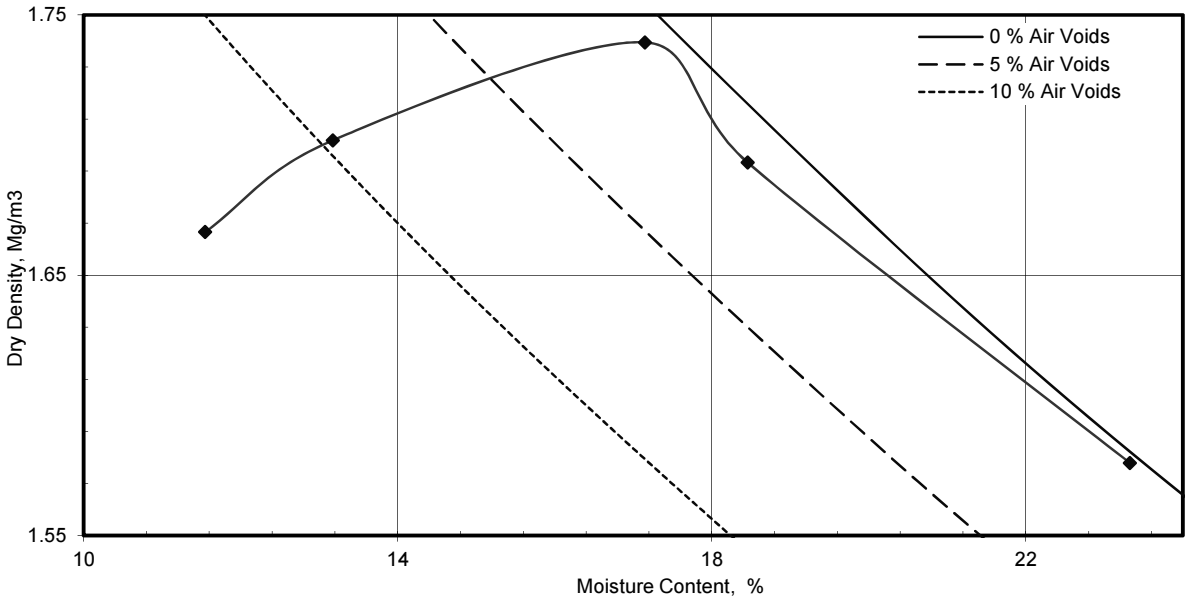
Environmental Science

Tested in accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	Not Given
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST REPORTS

Laboratory Reference:	628168		
Hole No.:	TPRT002	Depth Top [m]:	0.9
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Grey to brownish grey CLAY	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	1
Particle Density - Measured using gas jar	Mg/m³	2.51

Maximum Dry Density	Mg/m³	**1.74**

Optimum Moisture Content	%	**17**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Heavy Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

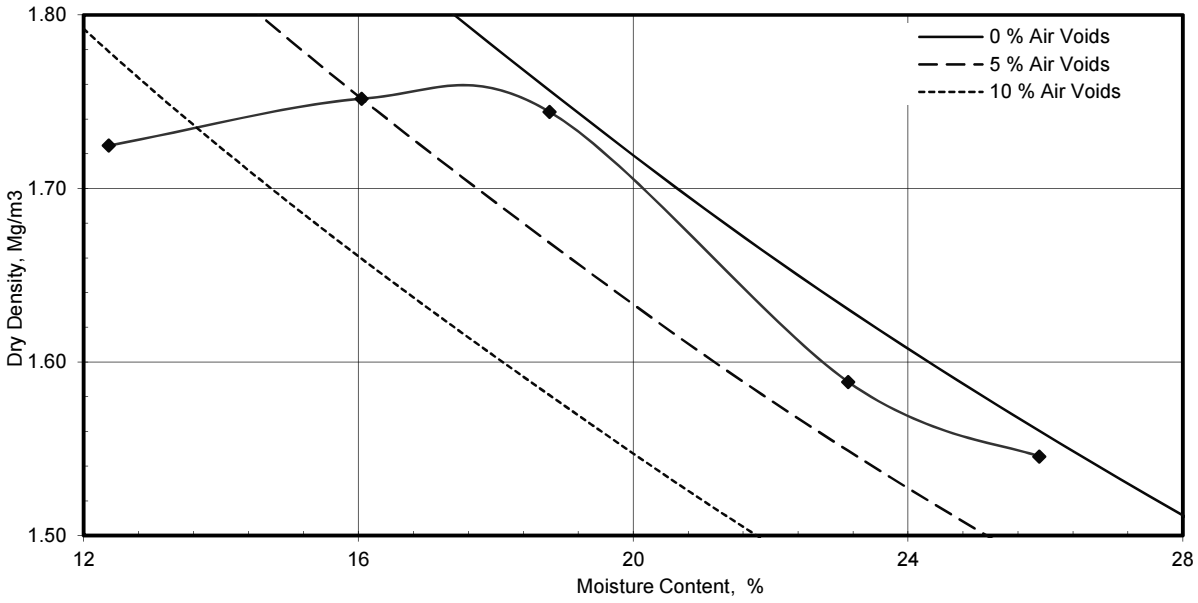
Environmental Science

Tested in accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	Not Given
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	27/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST REPORTS

Laboratory Reference:	628171		
Hole No.:	TPRT002	Depth Top [m]:	2.9
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Grey CLAY	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	2.62

Maximum Dry Density	Mg/m³	**1.75**

Optimum Moisture Content	%	**18**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Heavy Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

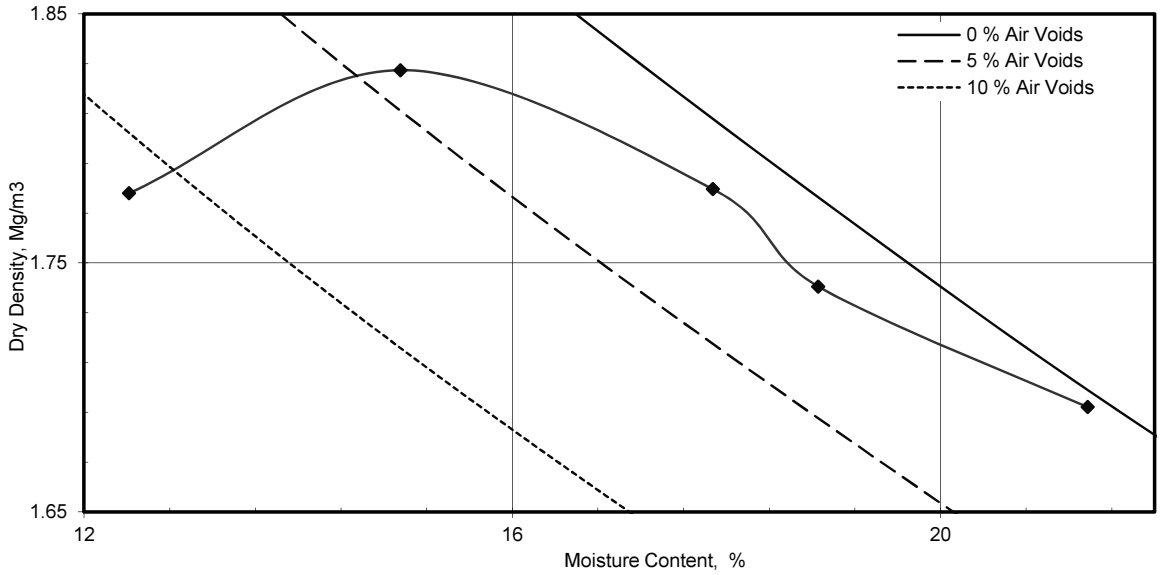
UKAS TESTING 4041

Tested in accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	Not Given
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	27/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST REPORTS

Laboratory Reference:	628176		
Hole No.:	TPG020	Depth Top [m]:	1.3
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Grey slightly gravelly CLAY with thick lamiane of yellowish brown slightly gravelly sand	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	2.67

Maximum Dry Density	Mg/m³	**1.83**

Optimum Moisture Content	%	**15**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Heavy Compaction

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7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

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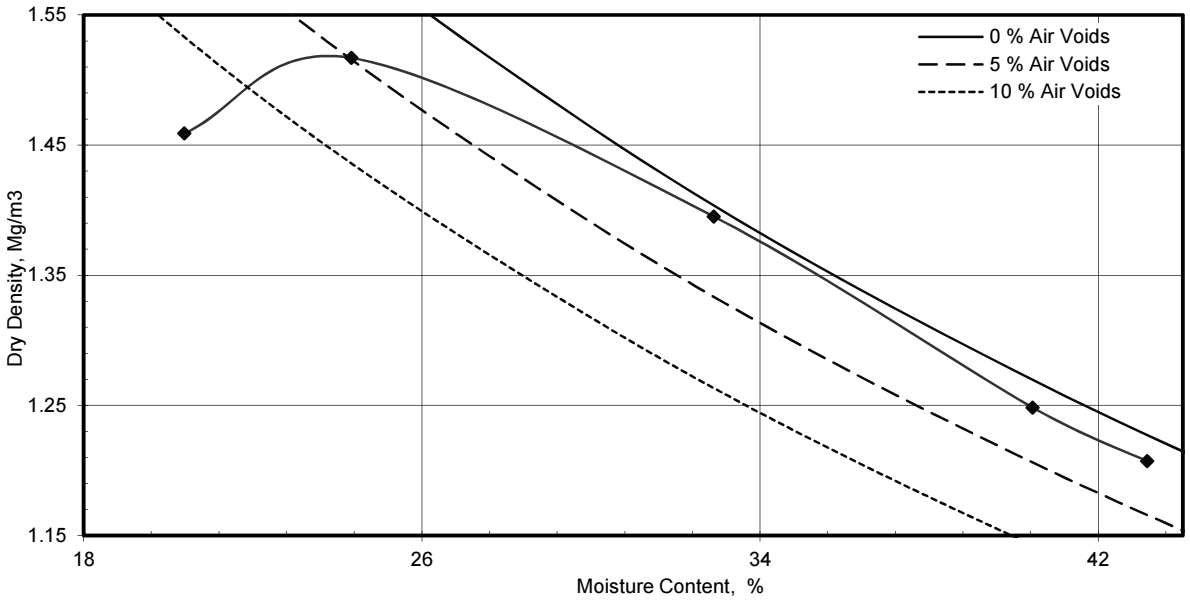
Environmental Science

Tested in accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	07/09/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	27/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST REPORTS

Laboratory Reference:	628180		
Hole No.:	TPL006	Depth Top [m]:	2.2
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Yellowish brown slightly gravelly CLAY	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	1
Particle Density - Measured using gas jar	Mg/m³	2.61

Maximum Dry Density	Mg/m³	**1.52**

Optimum Moisture Content	%	**24**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Heavy Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

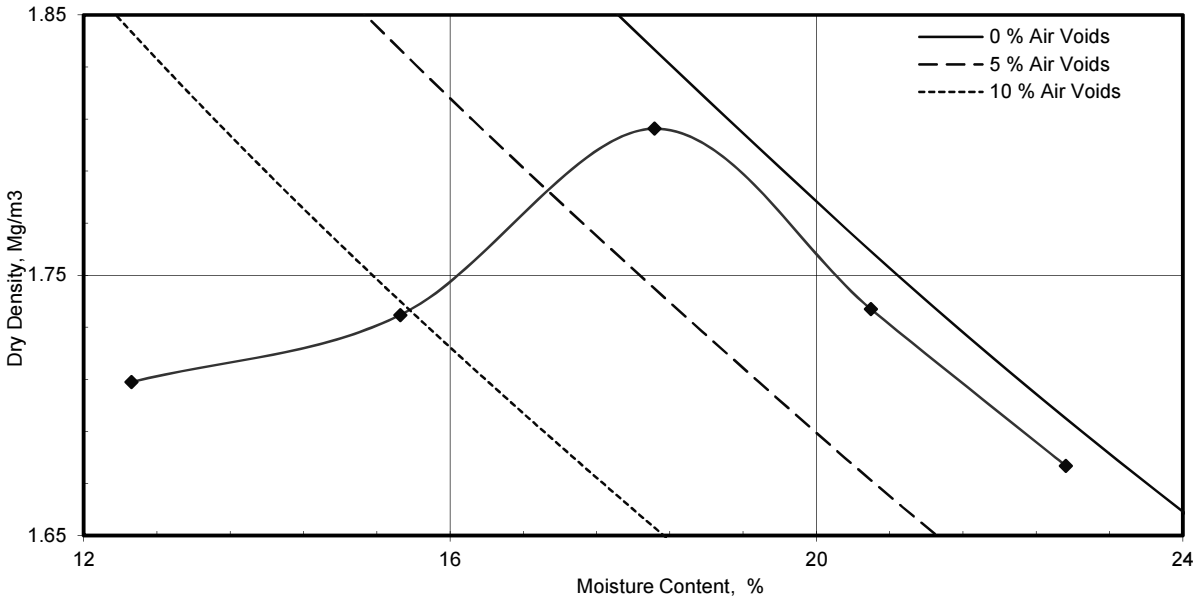
Environmental Science

Tested in accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	06/09/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	27/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST REPORTS

Laboratory Reference:	628184		
Hole No.:	TPL003	Depth Top [m]:	2.7
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Grey CLAY	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	2.76

Maximum Dry Density	Mg/m³	**1.81**

Optimum Moisture Content	%	**18**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of California Bearing Ratio

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

4041

Tested in Accordance with BS 1377-4: 1990: Clause 7

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	07/09/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

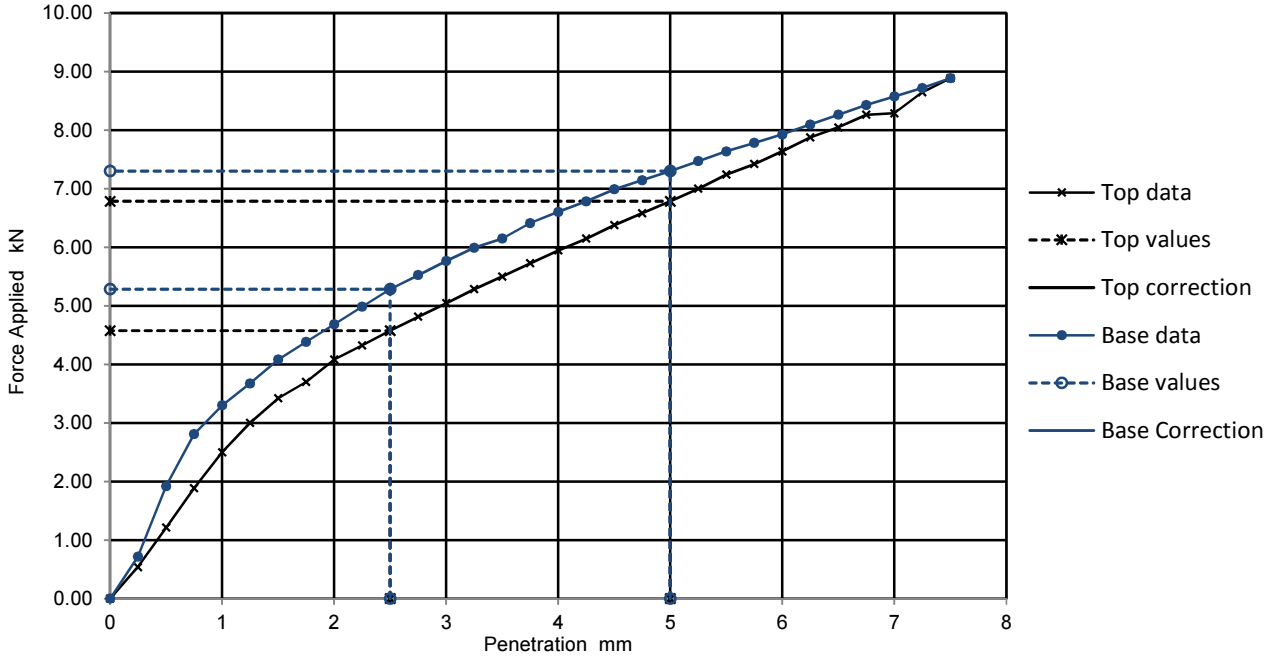
Test Results:

Laboratory Reference:	628122	Depth Top [m]:	0.5
Hole No.:	TPL010	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B

Specimen Preparation

Condition	Remoulded			Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer			Period of soaking	days
				Time to surface	days
Sample Description:	Brown slightly clayey SAND with rootlets			Amount of swell recorded	mm
Material retained on 20mm sieve removed		0	%	Dry density after soaking	Mg/m3
Initial Specimen details	Bulk density	1.99	Mg/m3	Surcharge applied	8 kg
	Dry density	1.85	Mg/m3		4.8 kPa
	Moisture content	7.6	%		

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	35.0	34.0	35.0	37.0	7.5
BASE	No	40.0	37.0	40.0		7.1

Remarks:

Test/ Specimen specific remarks:

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Geotechnical Manager

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of California Bearing Ratio

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

Tested in Accordance with BS 1377-4: 1990: Clause 7

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	31/08/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

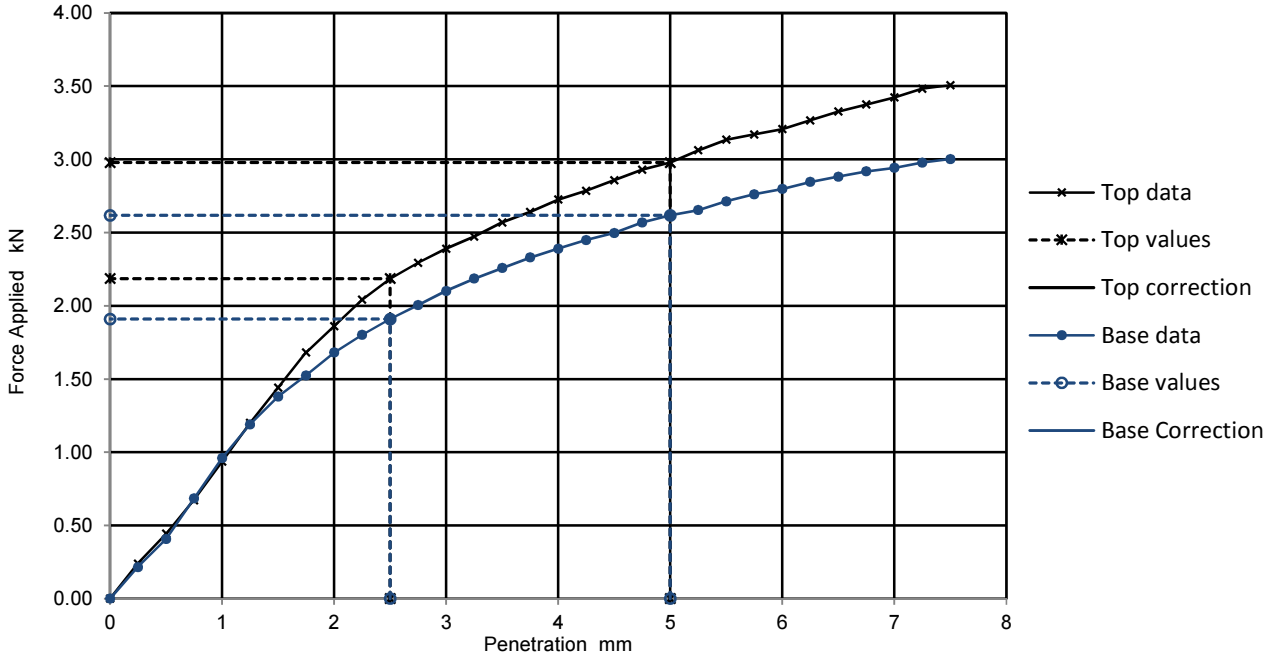
Test Results:

Laboratory Reference:	628131	Depth Top [m]:	1.5
Hole No.:	TPT022	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B

Specimen Preparation

Condition	Remoulded			Soaking details	Not soaked	
Details	Recompacted with specified standard effort using 2.5kg rammer			Period of soaking		days
				Time to surface		days
Sample Description:	Dark brown gravelly clayey SAND			Amount of swell recorded		mm
Material retained on 20mm sieve removed		2	%	Dry density after soaking		Mg/m3
Initial Specimen details	Bulk density	1.91	Mg/m3	Surcharge applied	8	kg
	Dry density	1.54	Mg/m3		4.9	kPa
	Moisture content	24.0	%			

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	17.0	15.0	17.0	16.0	27.7
BASE	No	14.0	13.0	14.0		29.1

Remarks:

Test/ Specimen specific remarks:

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Geotechnical Manager

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of California Bearing Ratio

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

4041

Tested in Accordance with BS 1377-4: 1990: Clause 7

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	05/09/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

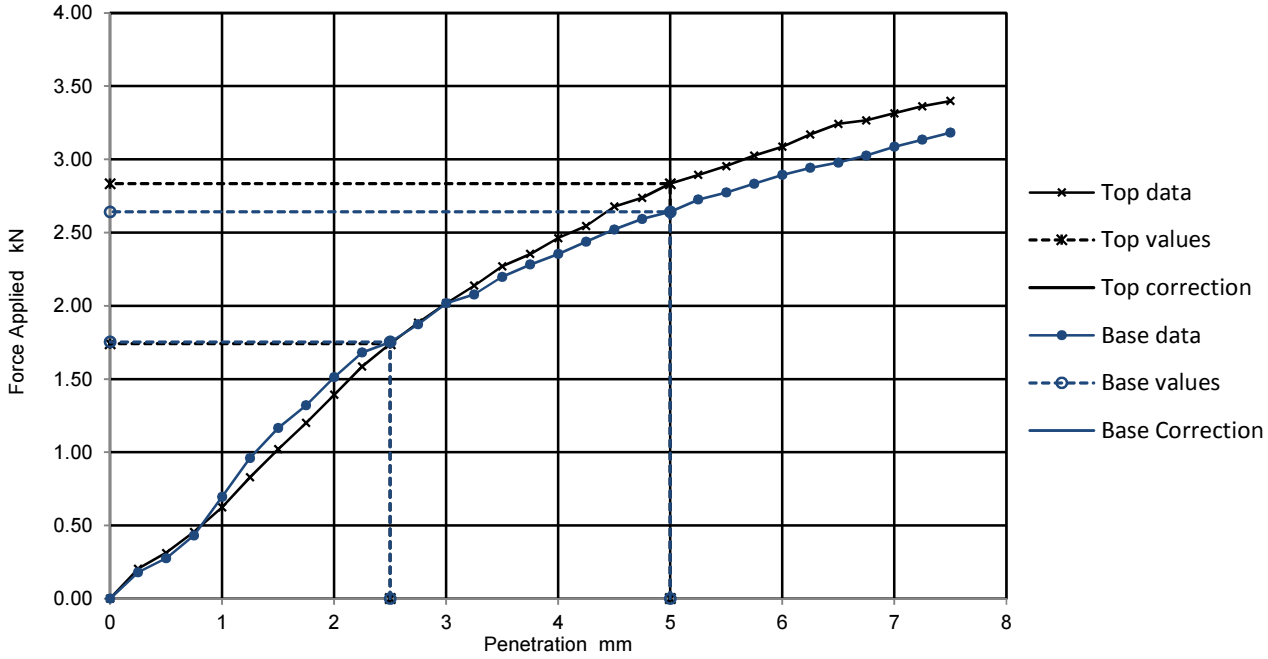
Test Results:

Laboratory Reference:	628135	Depth Top [m]:	0.6
Hole No.:	TPA004	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B

Specimen Preparation

Condition	Remoulded			Soaking details	Not soaked	
Details	Recompacted with specified standard effort using 2.5kg rammer			Period of soaking		days
				Time to surface		days
Sample Description:	Yellowish brown gravelly sandy CLAY with rootlets			Amount of swell recorded		mm
Material retained on 20mm sieve removed		15	%	Dry density after soaking		Mg/m3
Initial Specimen details	Bulk density	2.31	Mg/m3	Surcharge applied	8	kg
	Dry density	2.02	Mg/m3		4.8	kPa
	Moisture content	14.1	%			

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	13.0	14.0	14.0	14.0	13.9
BASE	No	13.0	13.0	13.0		14.3

Remarks:

Test/ Specimen specific remarks:

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Geotechnical Manager

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of California Bearing Ratio

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

4041

Tested in Accordance with BS 1377-4: 1990: Clause 7

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	04/09/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

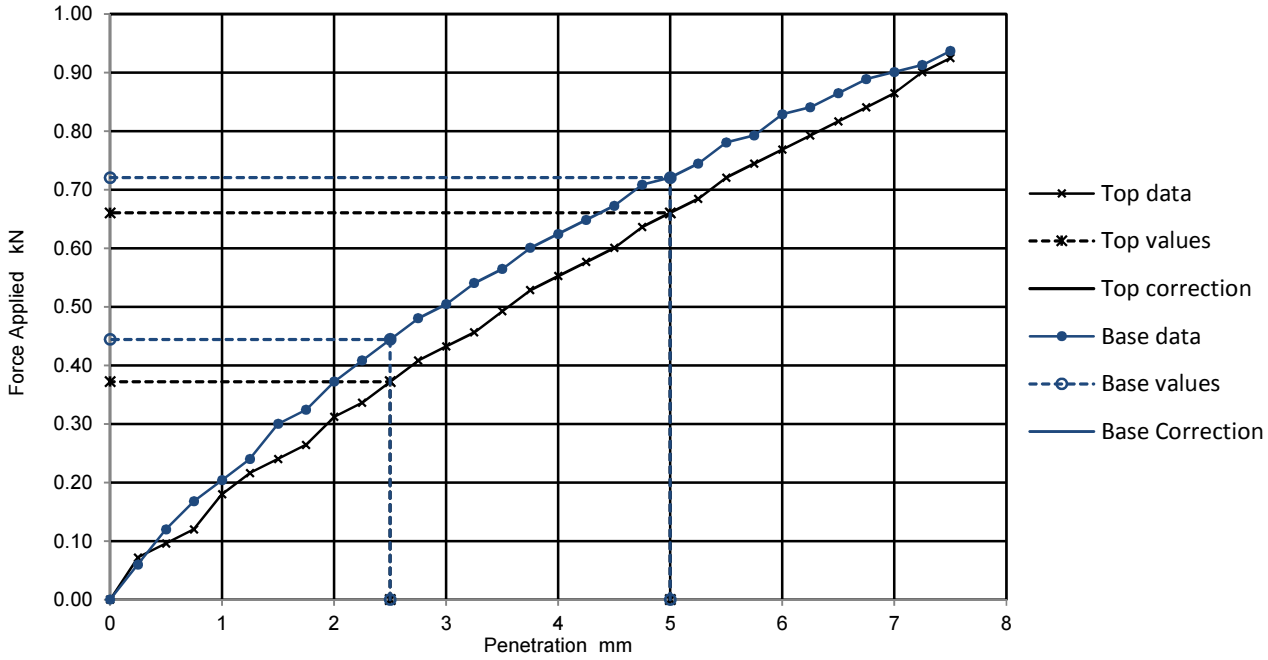
Test Results:

Laboratory Reference:	628140	Depth Top [m]:	0.6
Hole No.:	TPA024	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B

Specimen Preparation

Condition	Remoulded			Soaking details	Not soaked	
Details	Recompacted with specified standard effort using 2.5kg rammer			Period of soaking		days
				Time to surface		days
Sample Description:	Yellowish brown gravelly clayey SAND with rootlets			Amount of swell recorded		mm
Material retained on 20mm sieve removed		12	%	Dry density after soaking		Mg/m3
Initial Specimen details	Bulk density	2.06	Mg/m3	Surcharge applied	8	kg
	Dry density	1.75	Mg/m3		4.8	kPa
	Moisture content	17.8	%			

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	2.8	3.3	3.3	3.5	17.7
BASE	No	3.4	3.6	3.6		17.8

Remarks:

Test/ Specimen specific remarks:

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Geotechnical Manager

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of California Bearing Ratio

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

4041

Tested in Accordance with BS 1377-4: 1990: Clause 7

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	04/09/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

Test Results:

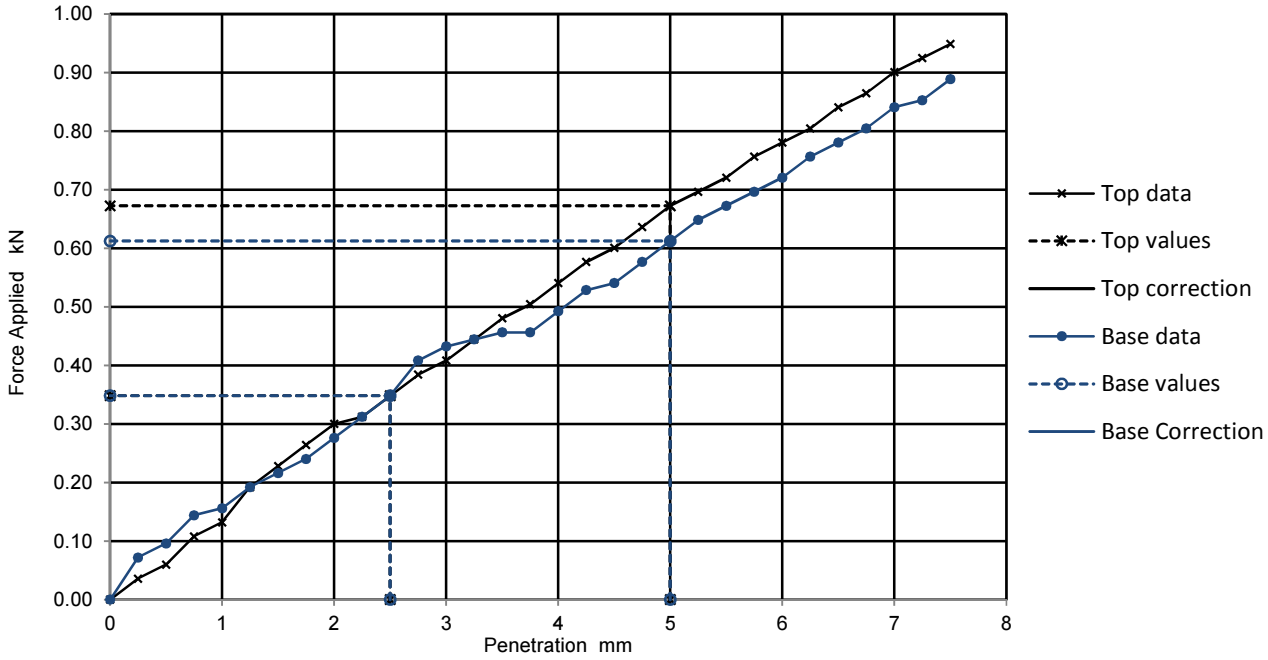
Laboratory Reference:	628142	Depth Top [m]:	1.3
Hole No.:	TPA028	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B

Specimen Preparation

Condition	Remoulded	Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer	Period of soaking	days
		Time to surface	days
Sample Description:	Brown slightly gravelly clayey fine to coarse SAND	Amount of swell recorded	mm
Material retained on 20mm sieve removed	0 %	Dry density after soaking	Mg/m3

Initial Specimen details	Bulk density	2.14	Mg/m3	Surcharge applied	8 kg
	Dry density	1.83	Mg/m3		4.9 kPa
	Moisture content	17.2	%		

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	2.6	3.4	3.4	3.2	16.4
BASE	No	2.6	3.1	3.1		16.6

Remarks:

Test/ Specimen specific remarks:

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Geotechnical Manager

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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Determination of California Bearing Ratio

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

4041

Tested in Accordance with BS 1377-4: 1990: Clause 7

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	25/08/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

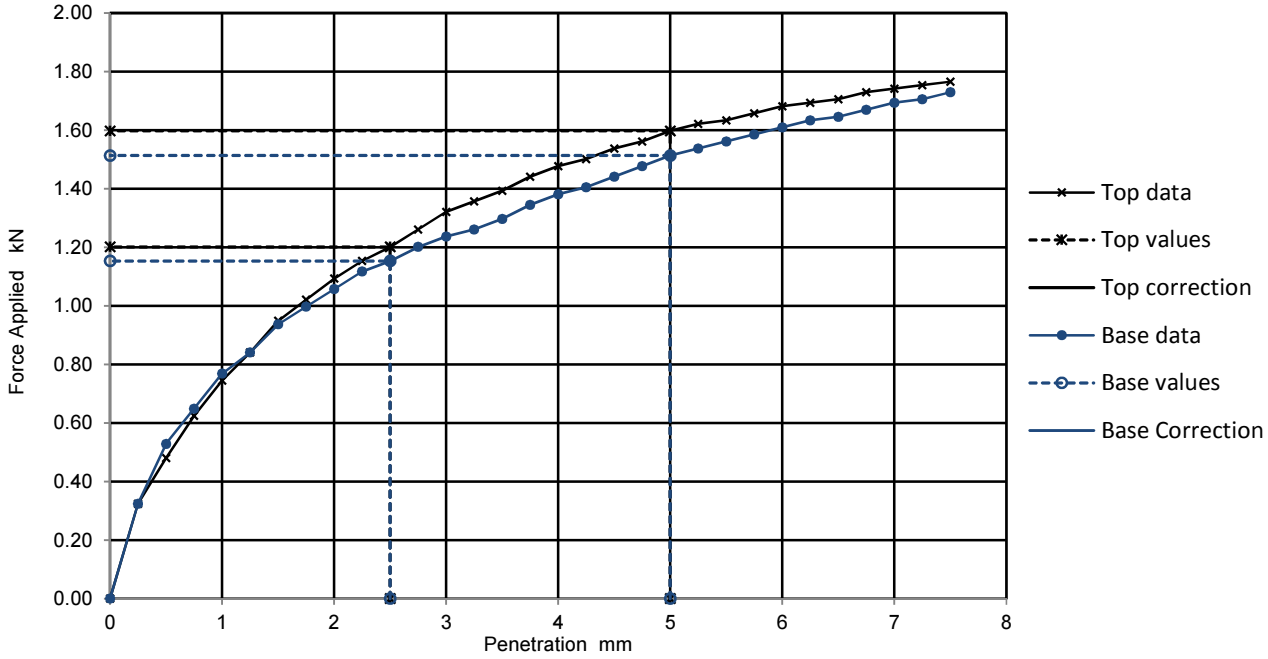
Test Results:

Laboratory Reference:	628151	Depth Top [m]:	1
Hole No.:	TPG062	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B

Specimen Preparation

Condition	Remoulded			Soaking details	Not soaked	
Details	Recompacted with specified standard effort using 2.5kg rammer			Period of soaking		days
				Time to surface		days
Sample Description:	Greyish brown slightly gravelly sandy CLAY			Amount of swell recorded		mm
Material retained on 20mm sieve removed		0	%	Dry density after soaking		Mg/m3
Initial Specimen details	Bulk density	2.04	Mg/m3	Surcharge applied	8	kg
	Dry density	1.67	Mg/m3		4.9	kPa
	Moisture content	22.3	%			

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	9.1	8.0	9.1	8.9	21.1
BASE	No	8.7	7.6	8.7		20.9

Remarks:

Test/ Specimen specific remarks:

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Geotechnical Manager

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of California Bearing Ratio

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

Tested in Accordance with BS 1377-4: 1990: Clause 7

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number: Date Sampled: Date Received:	16-27560 09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

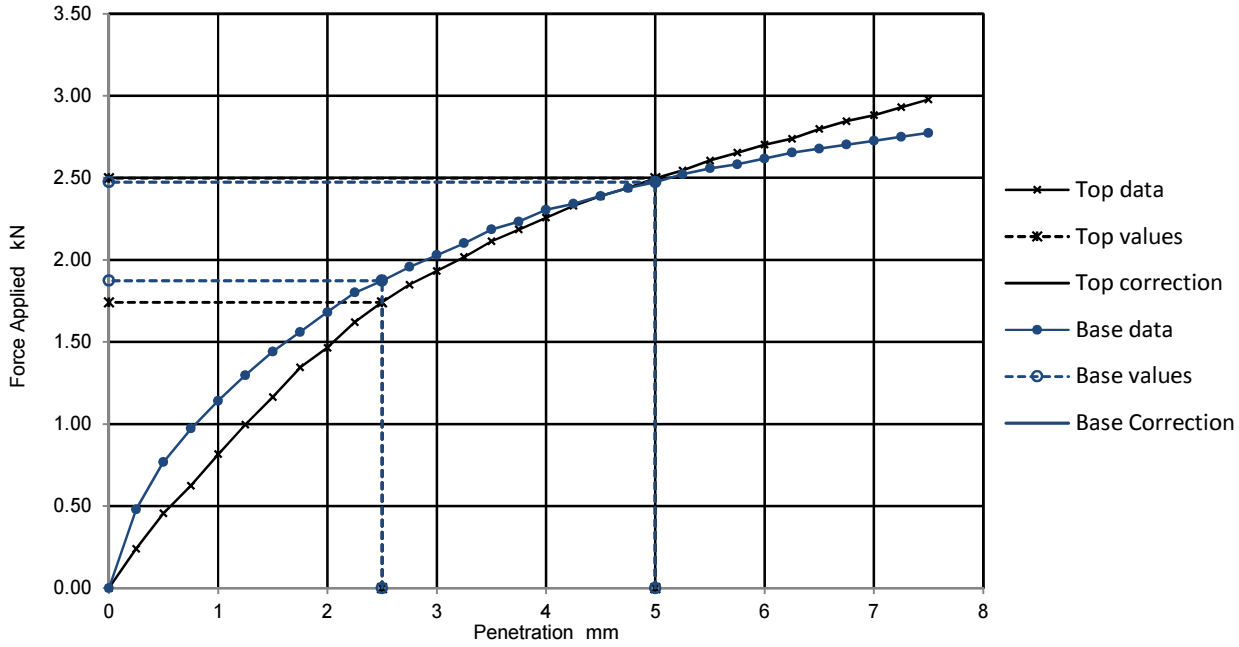
Test Results:

Laboratory Reference:	628164	Depth Top [m]:	0.7
Hole No.:	TPG056	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B

Specimen Preparation

Condition	Remoulded			Soaking details	Not soaked	
Details	Recompacted with specified standard effort using 2.5kg rammer			Period of soaking		days
				Time to surface		days
Sample Description:	Yellowish brown slightly gravelly sandy CLAY with rootlets			Amount of swell recorded		mm
Material retained on 20mm sieve removed		0	%	Dry density after soaking		Mg/m3
Initial Specimen details	Bulk density	2.01	Mg/m3	Surcharge applied	8	kg
	Dry density	1.66	Mg/m3		4.9	kPa
	Moisture content	21.4	%			

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	13.0	12.0	13.0	14.0	20.6
BASE	No	14.0	12.0	14.0		20.4

Remarks:

Test/ Specimen specific remarks:

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Geotechnical Manager

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of California Bearing Ratio

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

4041

Tested in Accordance with BS 1377-4: 1990: Clause 7

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number: Date Sampled: Date Received:	16-27560 09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

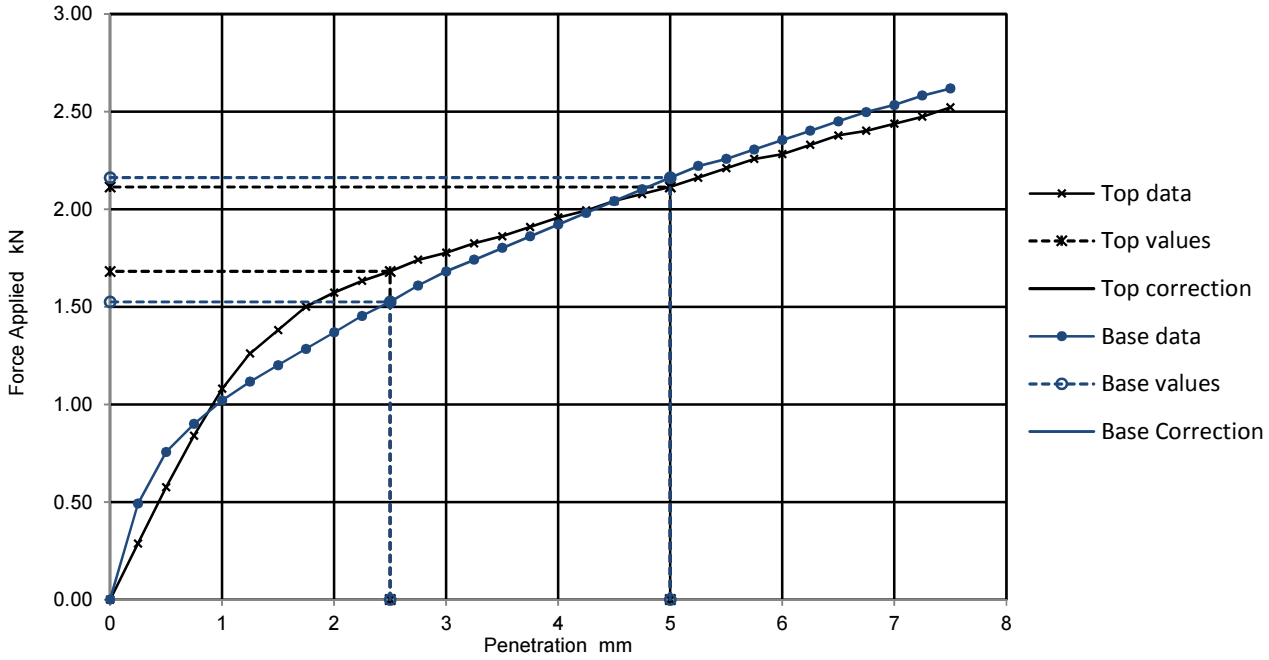
Test Results:

Laboratory Reference:	628169	Depth Top [m]:	0.75
Hole No.:	TPRT003	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B

Specimen Preparation

Condition	Remoulded			Soaking details	Not soaked	
Details	Recompacted with specified standard effort using 2.5kg rammer			Period of soaking		days
				Time to surface		days
Sample Description:	Greyish brown sandy CLAY			Amount of swell recorded		mm
Material retained on 20mm sieve removed		0	%	Dry density after soaking		Mg/m3
Initial Specimen details	Bulk density	1.82	Mg/m3	Surcharge applied	8	kg
	Dry density	1.49	Mg/m3		4.9	kPa
	Moisture content	22.4	%			

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	13.0	11.0	13.0	12.0	21.8
BASE	No	12.0	11.0	12.0		22.1

Remarks:

Test/ Specimen specific remarks:

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Geotechnical Manager

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of California Bearing Ratio

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

4041

Tested in Accordance with BS 1377-4: 1990: Clause 7

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	07/09/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

Test Results:

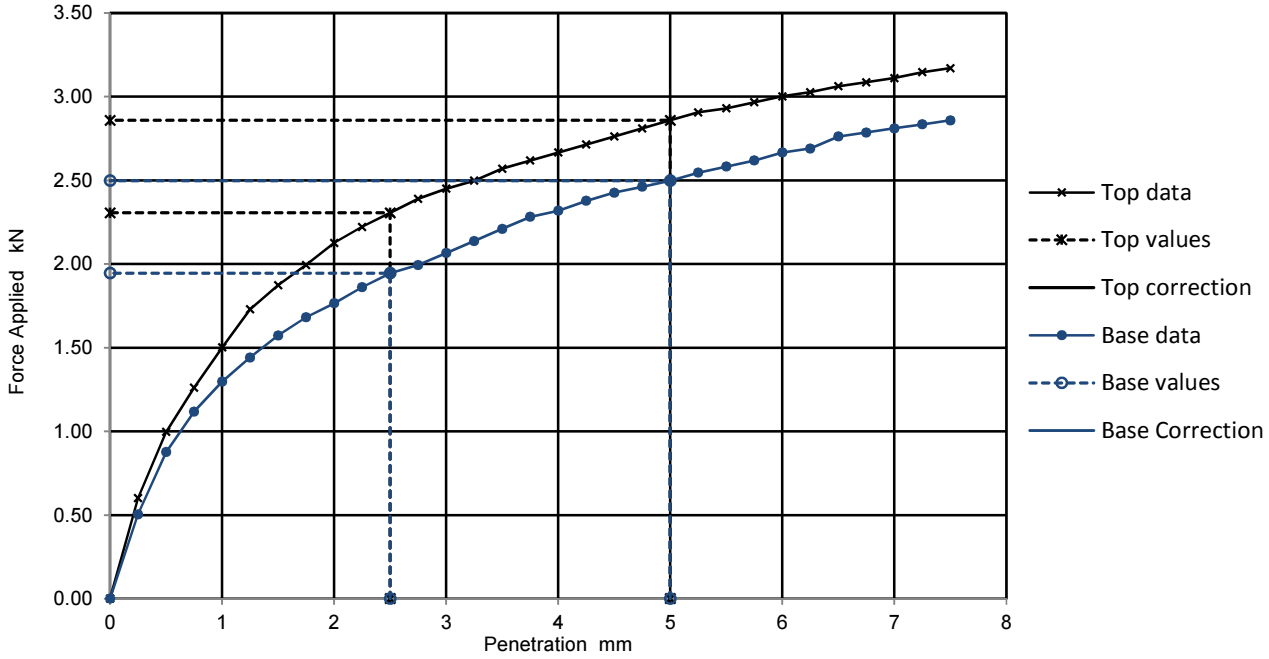
Laboratory Reference:	628179	Depth Top [m]:	1.2
Hole No.:	TPL006	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B

Specimen Preparation

Condition	Remoulded	Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer	Period of soaking	days
		Time to surface	days
Sample Description:	Yellowish brown slightly sandy CLAY with rootlets	Amount of swell recorded	mm
Material retained on 20mm sieve removed	0 %	Dry density after soaking	Mg/m3

Initial Specimen details	Bulk density	1.84	Mg/m3	Surcharge applied	8 kg
	Dry density	1.46	Mg/m3		4.9 kPa
	Moisture content	26.1	%		

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	17.0	14.0	17.0	16.0	26.2
BASE	No	15.0	12.0	15.0		26.1

Remarks:

Test/ Specimen specific remarks:

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Geotechnical Manager

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of California Bearing Ratio

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

4041

Tested in Accordance with BS 1377-4: 1990: Clause 7

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	07/09/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

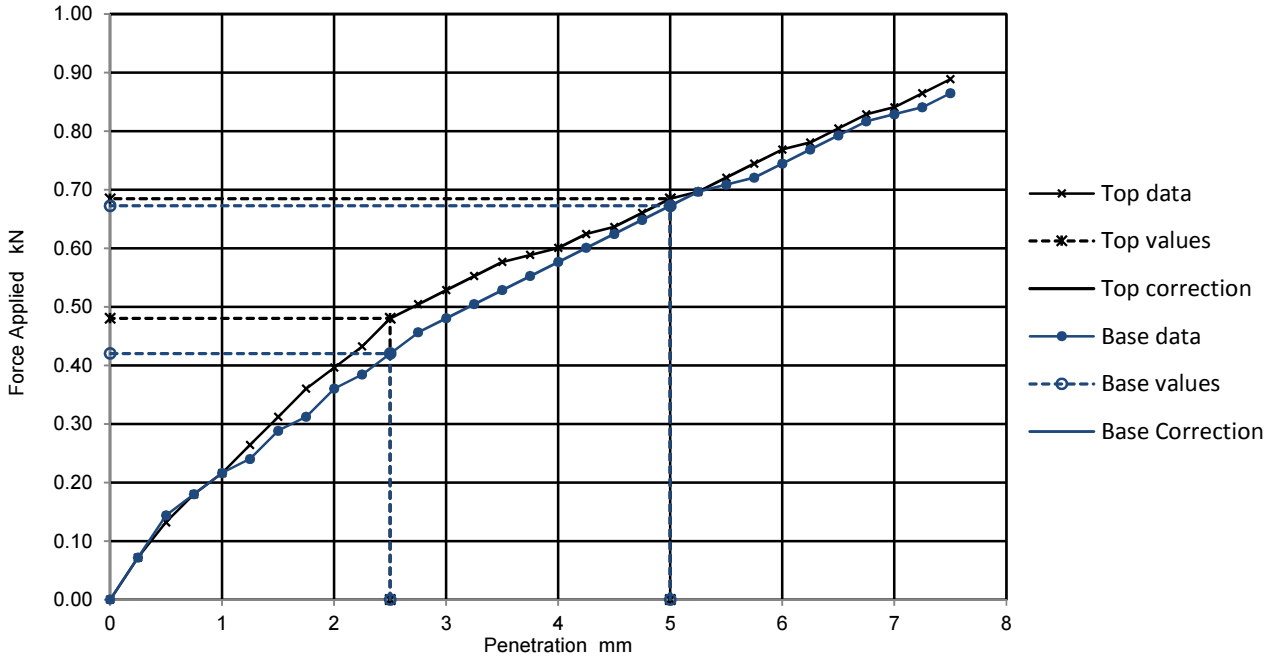
Test Results:

Laboratory Reference:	628182	Depth Top [m]:	3.1
Hole No.:	TPA024	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B

Specimen Preparation

Condition	Remoulded			Soaking details	Not soaked
Details	Recompacted with specified standard effort using 2.5kg rammer			Period of soaking	days
				Time to surface	days
Sample Description:	Dark grey sandy CLAY			Amount of swell recorded	mm
Material retained on 20mm sieve removed		0	%	Dry density after soaking	Mg/m3
Initial Specimen details	Bulk density	2.00	Mg/m3	Surcharge applied	kg
	Dry density	1.63	Mg/m3		kPa
	Moisture content	22.4	%		

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	3.6	3.4	3.6	3.5	22.3
BASE	No	3.2	3.4	3.4		22.3

Remarks:

Test/ Specimen specific remarks:

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Geotechnical Manager

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Light Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

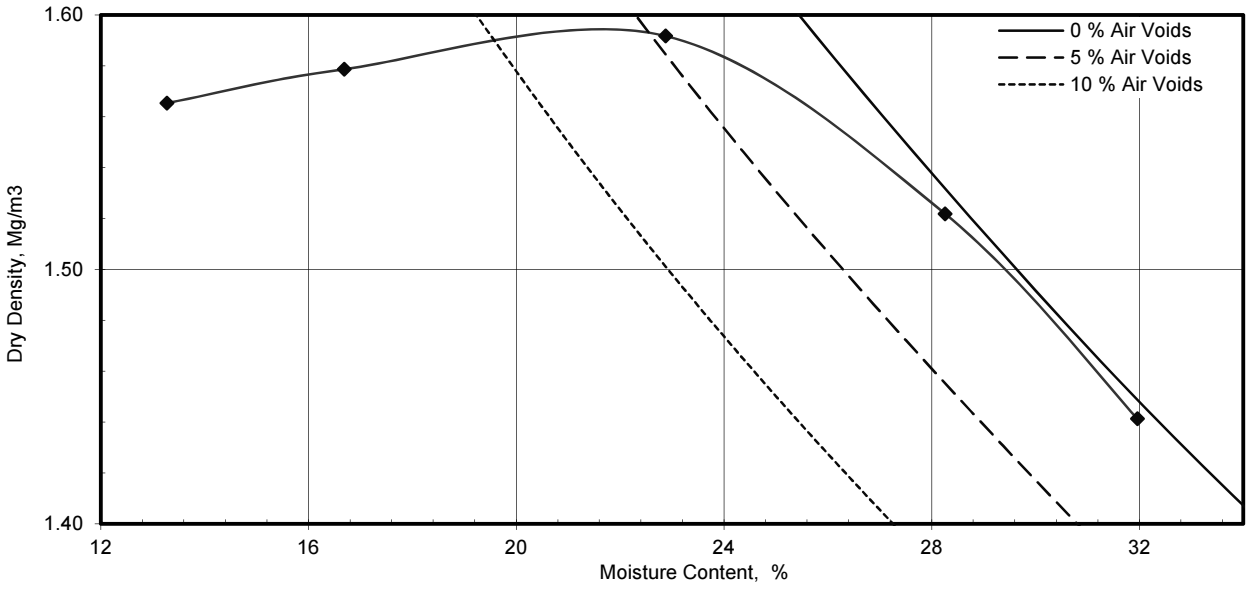
UKAS TESTING 4041

Tested in accordance with BS 1377-4:1990: Clause 3.3 using 2.5kg[light] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	30/08/2016
		Date Received:	09/09/2016
		Date Tested:	22/09/2016
Contact:	Richard Brown	Sampled By:	RB/AO/WS
Site Name:	Rail Centre		
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference:	628130		
Hole No.:	TPT021	Depth Top [m]:	1.8
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Greyish brown slightly sandy gravelly CLAY	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	2
Particle Density - Measured using gas jar	Mg/m³	2.70

Maximum Dry Density	Mg/m³	**1.59**

Optimum Moisture Content	%	**22**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland."

TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Light Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

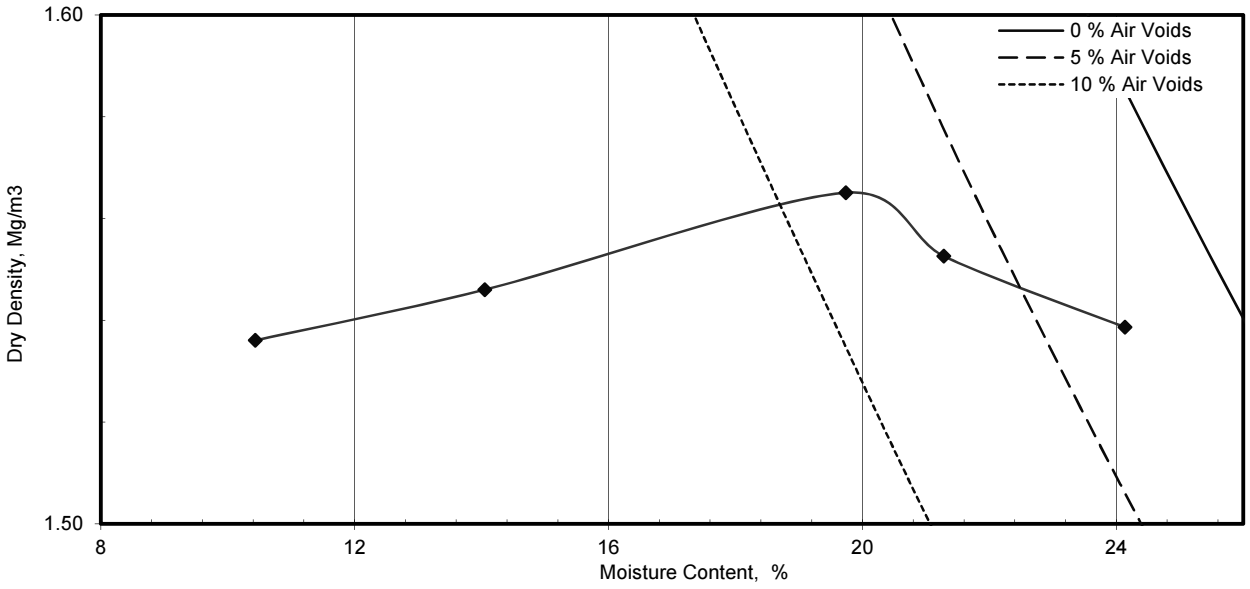
UKAS TESTING 4041

Tested in accordance with BS 1377-4:1990: Clause 3.3 using 2.5kg[light] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	23/08/2016
		Date Received:	09/09/2016
		Date Tested:	22/09/2016
Contact:	Richard Brown	Sampled By:	RB/AO/WS
Site Name:	Rail Centre		
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference:	628137		
Hole No.:	TPA008	Depth Top [m]:	0.35
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Brown slightly gravelly slightly sandy CLAY	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	2.57

Maximum Dry Density	Mg/m³	**1.57**

Optimum Moisture Content	%	**20**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Light Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

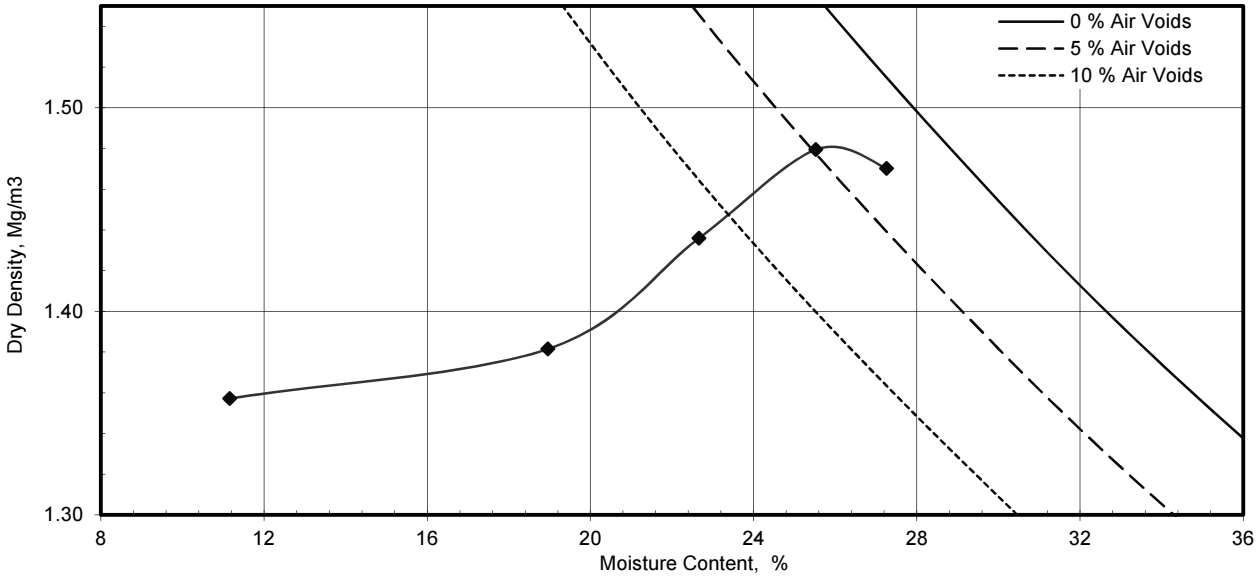
UKAS TESTING 4041

Tested in accordance with BS 1377-4:1990: Clause 3.3 using 2.5kg[light] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	26/08/2016
		Date Received:	09/09/2016
		Date Tested:	22/09/2016
Contact:	Richard Brown	Sampled By:	RB/AO/WS
Site Name:	Rail Centre		
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference:	628145		
Hole No.:	TPR003	Depth Top [m]:	1.1
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Grey sandy CLAY with rootlets	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	2.58

Maximum Dry Density	Mg/m³	**1.48**

Optimum Moisture Content	%	**26**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Light Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

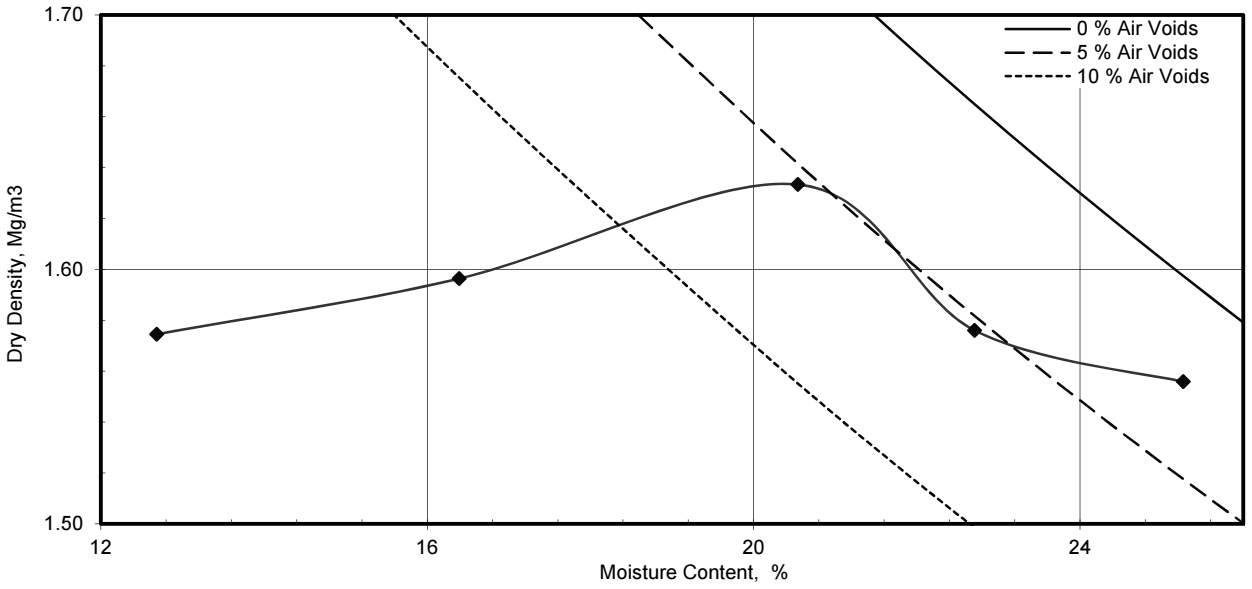
UKAS TESTING 4041

Tested in accordance with BS 1377-4:1990: Clause 3.3 using 2.5kg[light] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	Not Given
		Date Received:	09/09/2016
		Date Tested:	23/09/2016
Contact:	Richard Brown	Sampled By:	RB/AO/WS
Site Name:	Rail Centre		
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference:	628160		
Hole No.:	TPA012	Depth Top [m]:	1.8
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Greyish brown sandy CLAY	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	2.68

Maximum Dry Density	Mg/m³	**1.63**

Optimum Moisture Content	%	**21**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Light Compaction

i2 Analytical Ltd
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Croxley Green Business Park
Watford Herts WD18 8YS

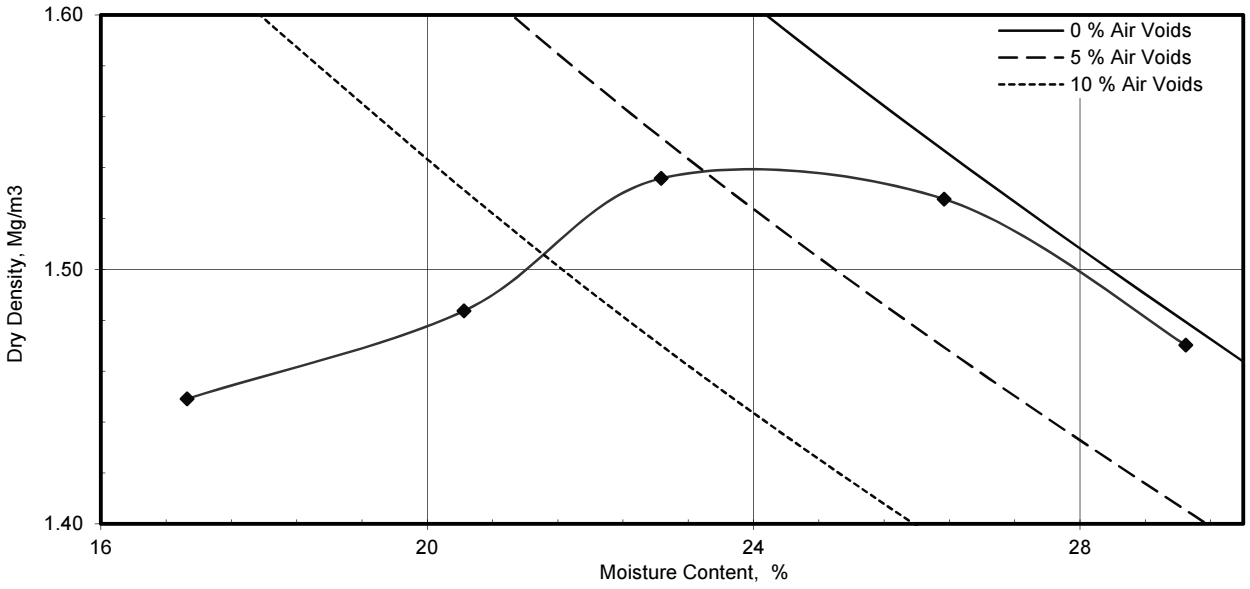
UKAS TESTING 4041

Tested in accordance with BS 1377-4:1990: Clause 3.3 using 2.5kg[light] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	Not Given
		Date Received:	09/09/2016
		Date Tested:	23/09/2016
Contact:	Richard Brown	Sampled By:	RB/AO/WS
Site Name:	Rail Centre		
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference:	628166		
Hole No.:	TPT002	Depth Top [m]:	2.8
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Greyish brown sandy CLAY	Sample Type:	B



Preparation		-2146826273
Mould Type		1 Litre
Samples Used		
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	2.61

Maximum Dry Density	Mg/m³	**1.54**

Optimum Moisture Content	%	**24**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Light Compaction

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Watford Herts WD18 8YS

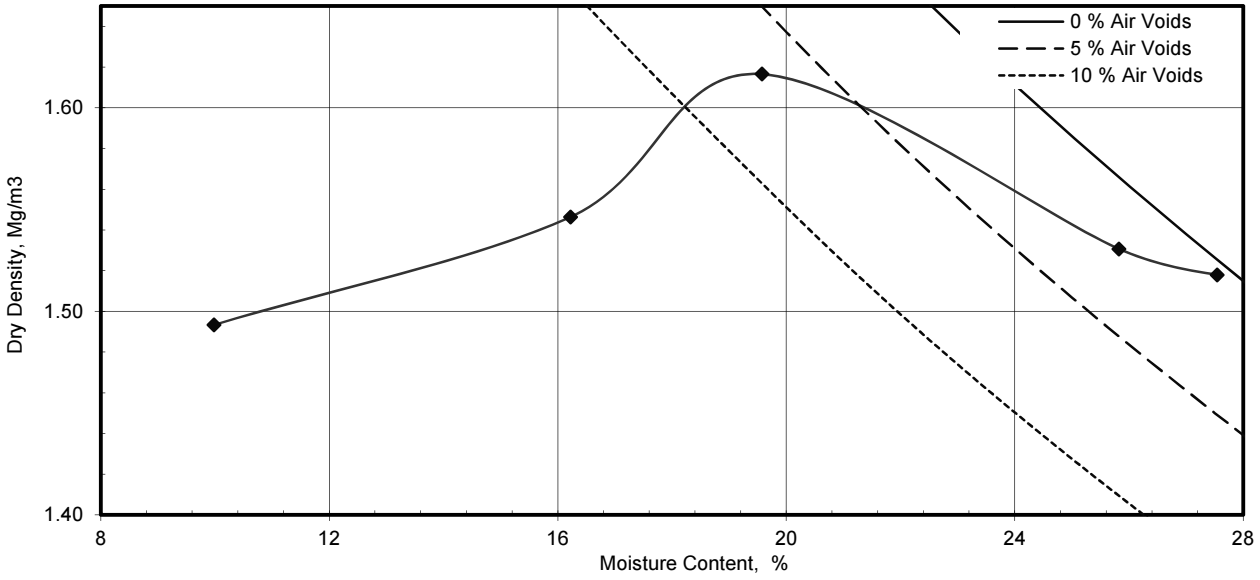
UKAS TESTING 4041

Tested in accordance with BS 1377-4:1990: Clause 3.3 using 2.5kg[light] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	Not Given
		Date Received:	09/09/2016
		Date Tested:	23/09/2016
Contact:	Richard Brown	Sampled By:	RB/AO/WS
Site Name:	Rail Centre		
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference:	628172		
Hole No.:	TPG011	Depth Top [m]:	2.8
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Greyish brown sandy CLAY	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	2.63

Maximum Dry Density	Mg/m³	**1.62**

Optimum Moisture Content	%	**20**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Heavy Compaction

i2 Analytical Ltd
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Croxley Green Business Park
Watford Herts WD18 8YS

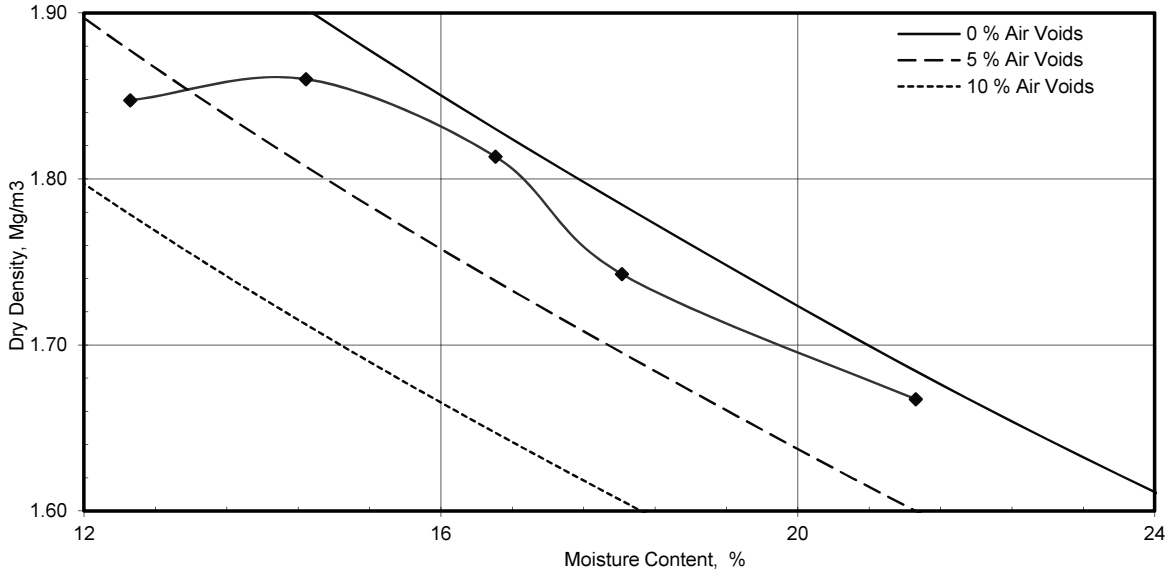
UKAS TESTING 4041

Tested in accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	07/09/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST REPORTS

Laboratory Reference:	628121		
Hole No.:	TPL008	Depth Top [m]:	2.5
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Brownish grey slightly gravwelly slightly sandy CLAY with fragments of chalk	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	1
Particle Density - Measured using gas jar	Mg/m³	2.63

Maximum Dry Density	Mg/m³	**1.86**

Optimum Moisture Content	%	**14**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Heavy Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

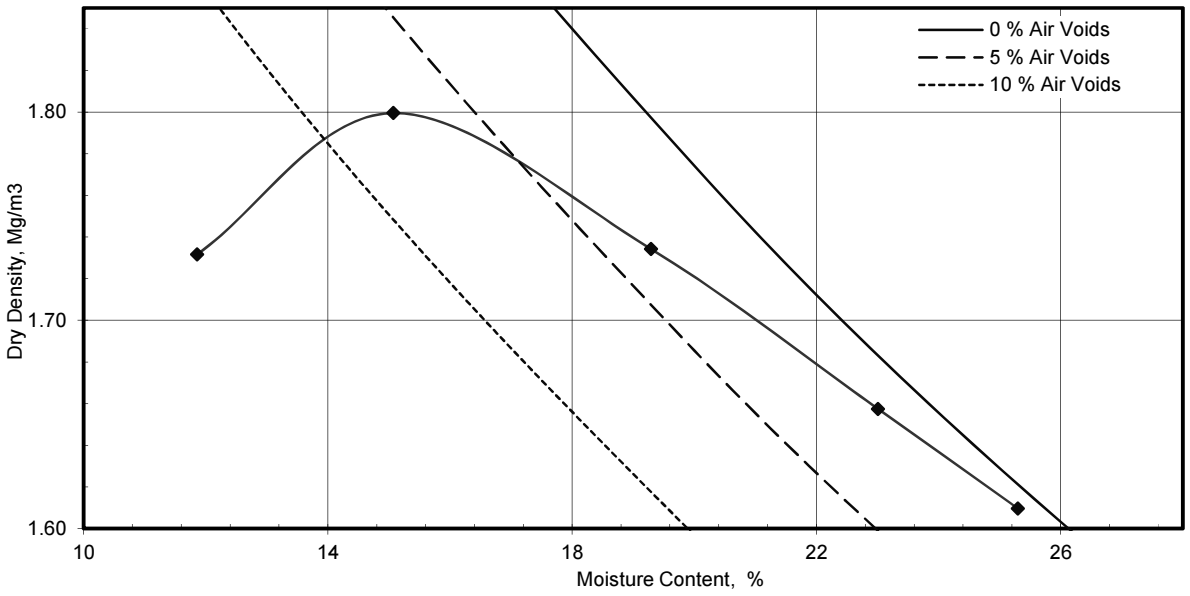
Environmental Science

Tested in accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	01/09/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	26/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST REPORTS

Laboratory Reference:	628128		
Hole No.:	TPT019	Depth Top [m]:	1.5
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Multicolour slightly sandy CLAY	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	3
Particle Density - Measured using gas jar	Mg/m³	2.75

Maximum Dry Density	Mg/m³	**1.80**

Optimum Moisture Content	%	**15**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Heavy Compaction

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7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

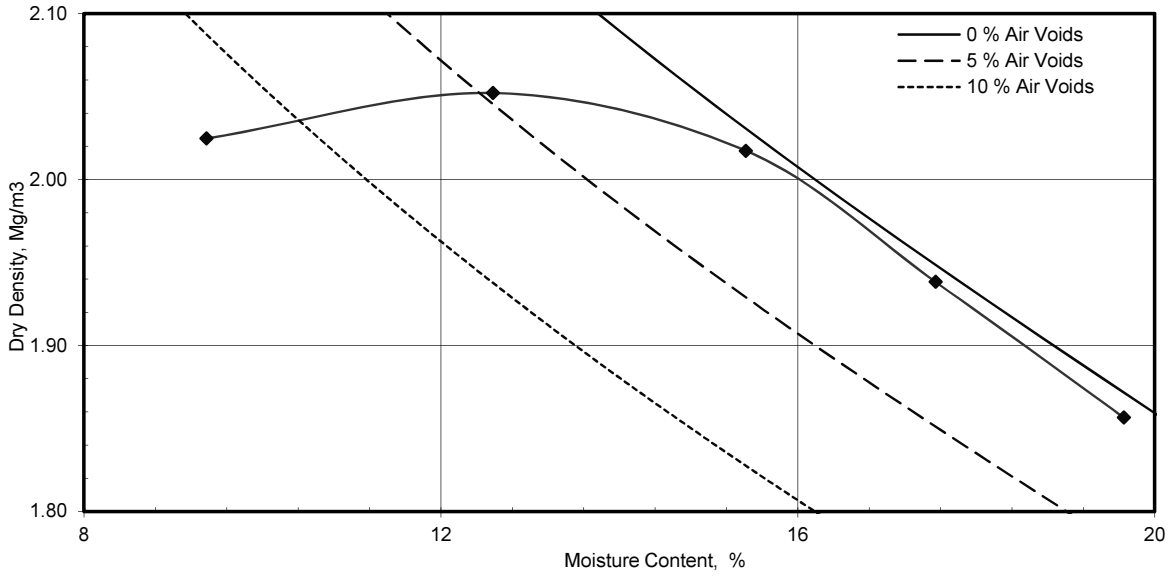
UKAS TESTING 4041

Tested in accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	22/08/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	26/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST REPORTS

Laboratory Reference:	628136		
Hole No.:	TPA007	Depth Top [m]:	1.4
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Light grey CLAY with thick laminae of yellowish brown gravelly sand	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	1
Particle Density - Measured using gas jar	Mg/m³	2.96

Maximum Dry Density	Mg/m³	**2.05**

Optimum Moisture Content	%	**13**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Heavy Compaction

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Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

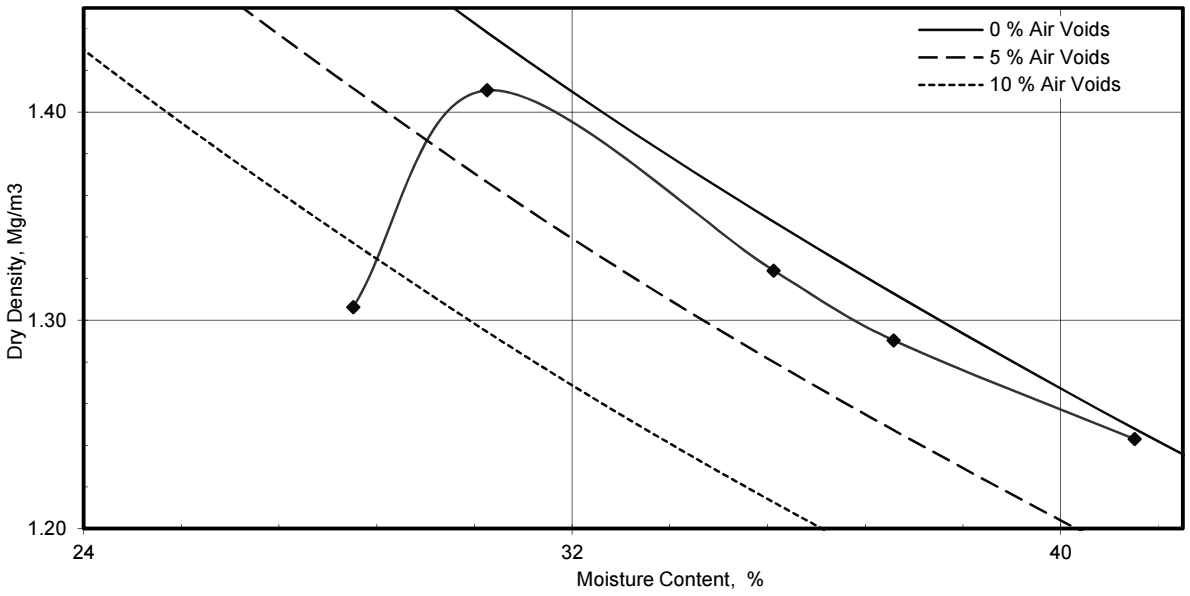
Environmental Science

Tested in accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	04/09/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	27/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST REPORTS

Laboratory Reference:	628141		
Hole No.:	TPA025	Depth Top [m]:	0.8
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Yellowish brown CLAY	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	2.57

Maximum Dry Density	Mg/m³	**1.41**

Optimum Moisture Content	%	**31**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Heavy Compaction

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Croxley Green Business Park
Watford Herts WD18 8YS

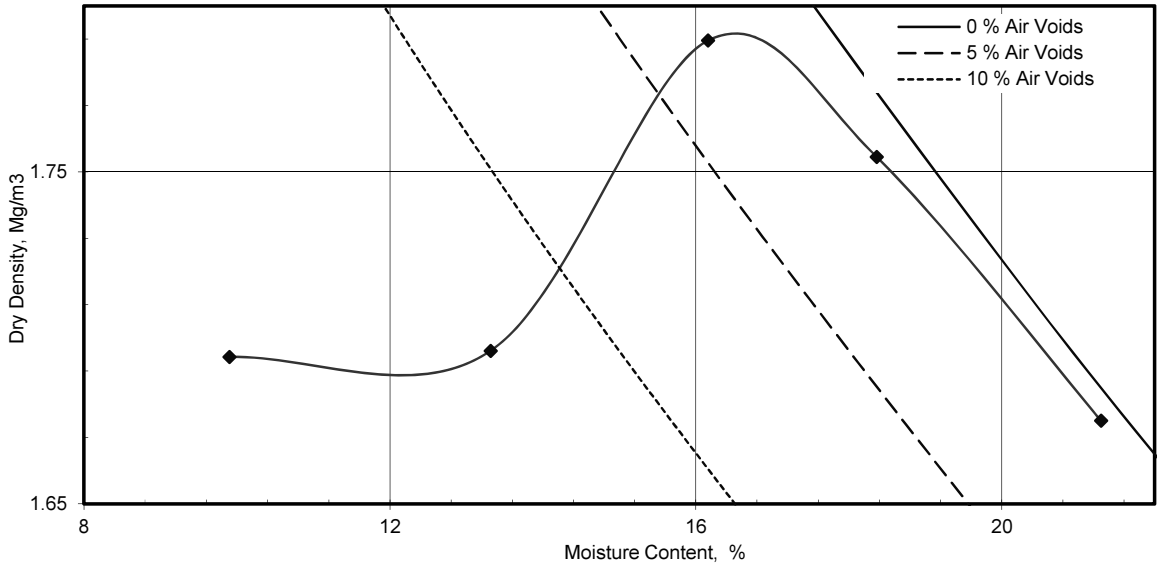
UKAS TESTING 4041

Tested in accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	26/08/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST REPORTS

Laboratory Reference:	628146		
Hole No.:	TPR004	Depth Top [m]:	1.6
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Yellowish brown to grey slightly gravelly CLAY with fragments of chalk	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	2
Particle Density - Measured using gas jar	Mg/m³	2.63

Maximum Dry Density	Mg/m³	**1.79**

Optimum Moisture Content	%	**16**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Heavy Compaction

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7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

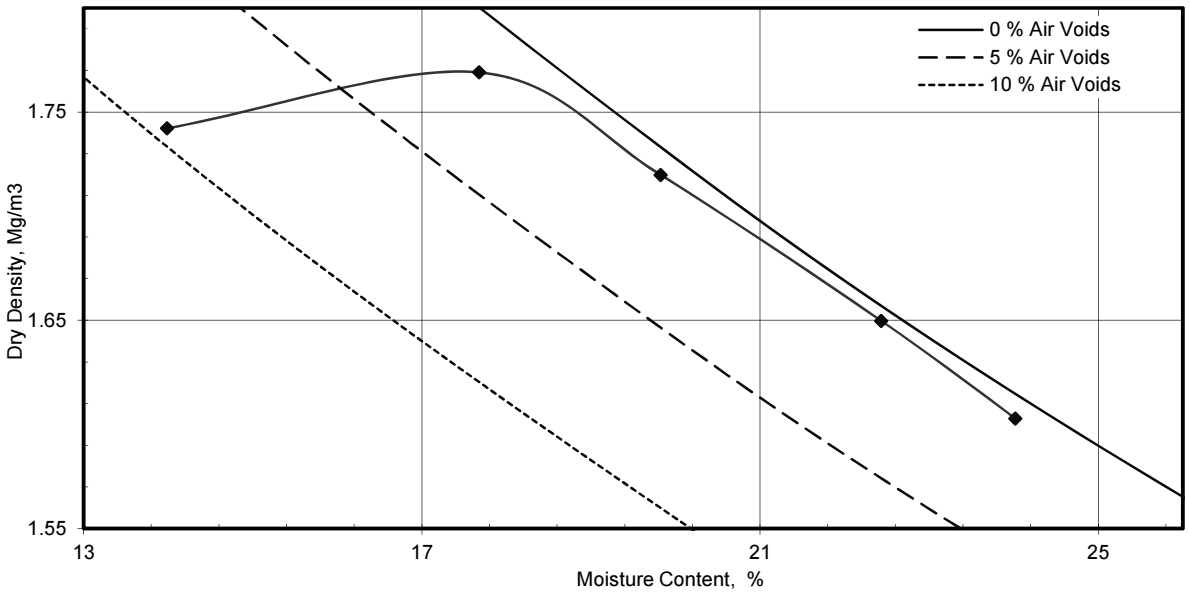
Environmental Science

Tested in accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	26/08/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	27/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST REPORTS

Laboratory Reference:	628149		
Hole No.:	TPG033	Depth Top [m]:	2.7
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Grey CLAY	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	2.64

Maximum Dry Density	Mg/m³	**1.77**

Optimum Moisture Content	%	**18**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Heavy Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

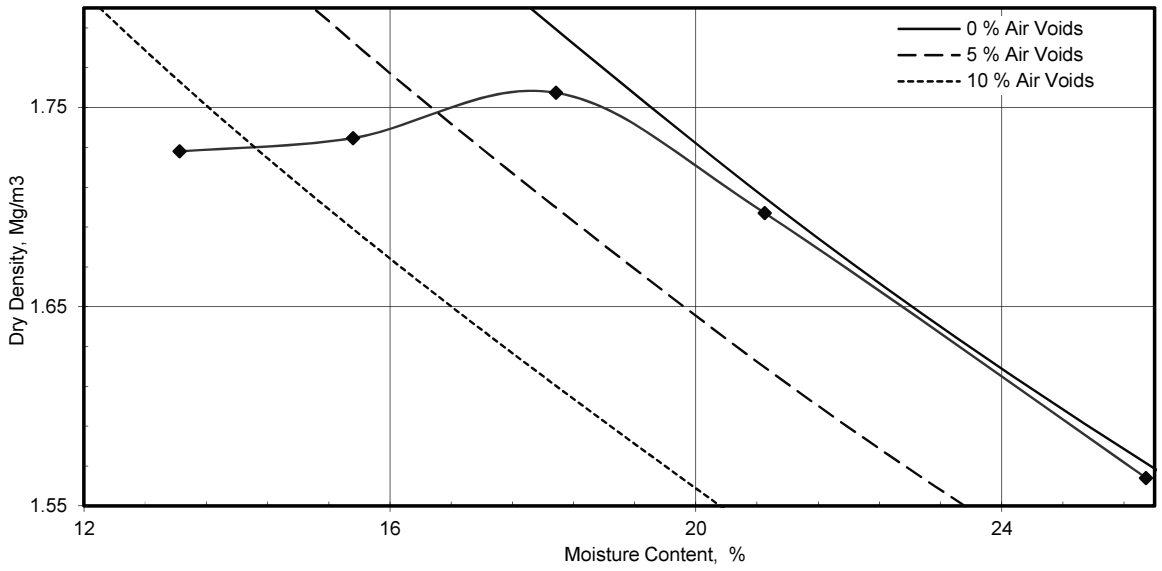
4041

Tested in accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	Not Given
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	27/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST REPORTS

Laboratory Reference:	628157		
Hole No.:	TPG025	Depth Top [m]:	2.3
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Grey to brownish grey CLAY with fragments of gypsum crystals	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	1
Particle Density - Measured using gas jar	Mg/m³	2.65

Maximum Dry Density	Mg/m³	**1.76**

Optimum Moisture Content	%	**18**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Heavy Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

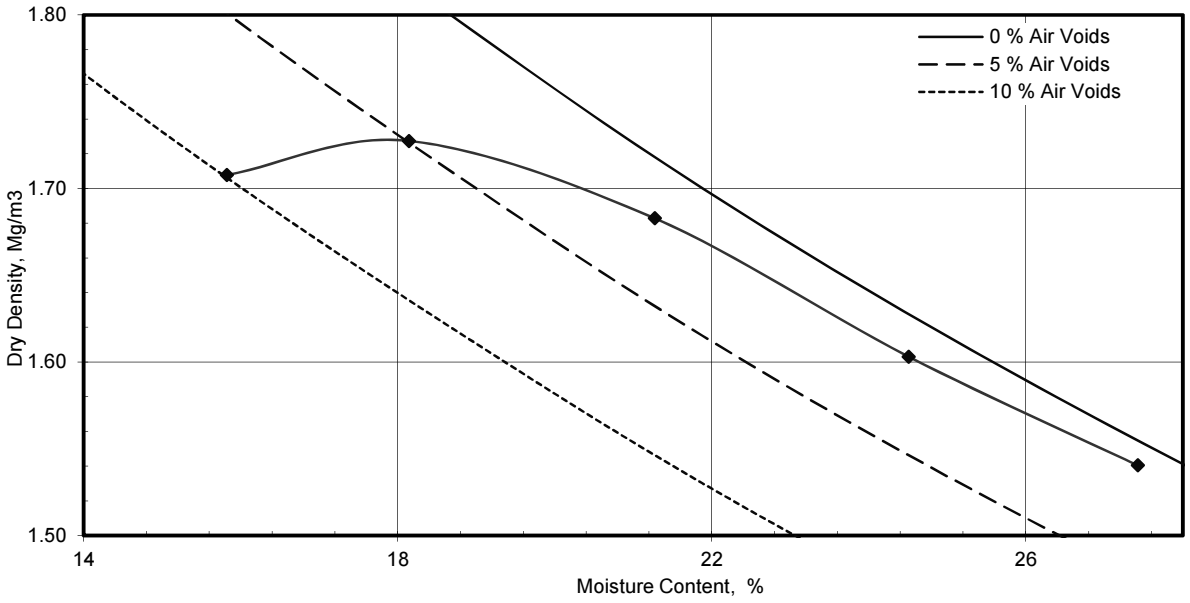
Environmental Science

Tested in accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	Not Given
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	27/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST REPORTS

Laboratory Reference:	628158		
Hole No.:	TPT008	Depth Top [m]:	1.6
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Grey to brownish grey CLAY	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	2.71

Maximum Dry Density	Mg/m³	**1.73**

Optimum Moisture Content	%	**18**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Heavy Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

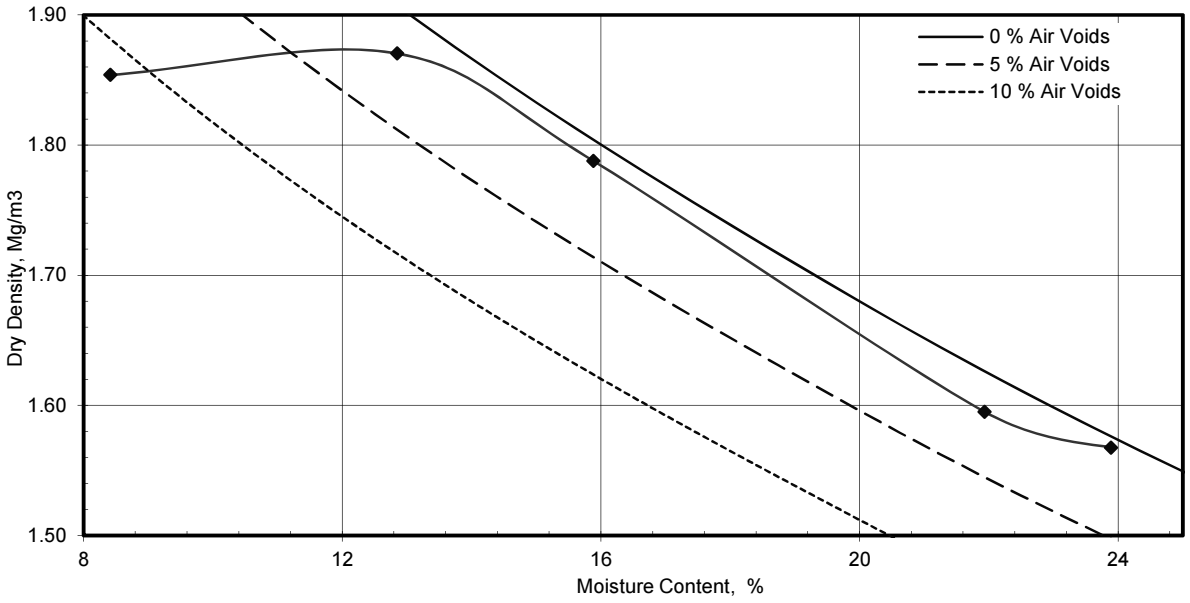
Environmental Science

Tested in accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	Not Given
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	27/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST REPORTS

Laboratory Reference:	628165		
Hole No.:	TPL002	Depth Top [m]:	0.7
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Yellowish brown CLAY with grass	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	2
Particle Density - Measured using gas jar	Mg/m³	2.53

Maximum Dry Density	Mg/m³	**1.87**

Optimum Moisture Content	%	**12**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Heavy Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

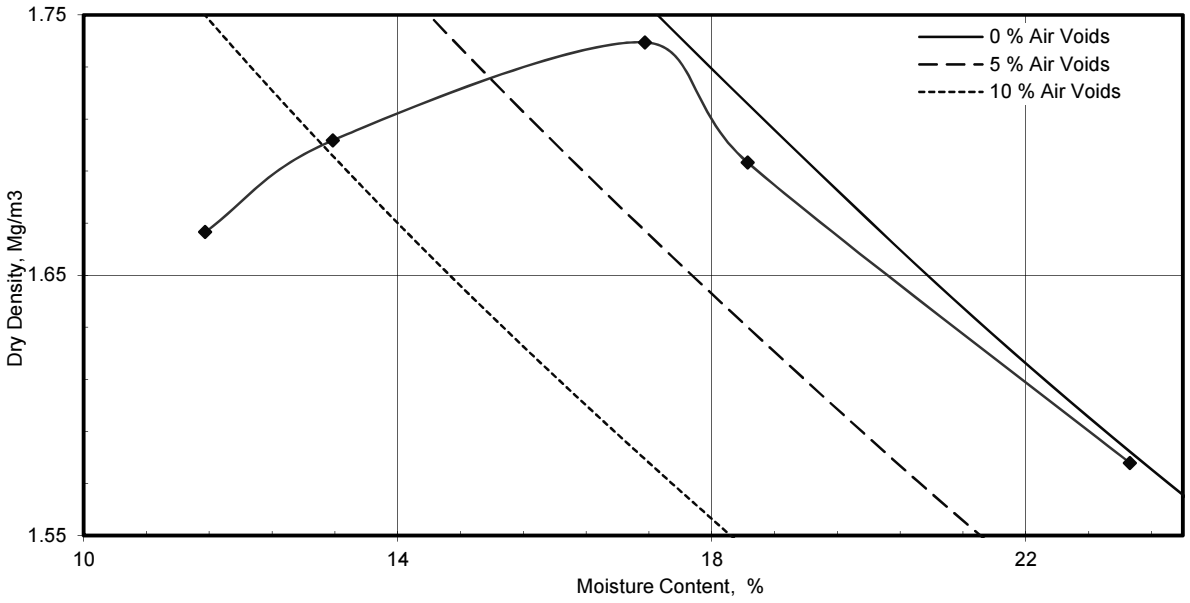
Environmental Science

Tested in accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	Not Given
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST REPORTS

Laboratory Reference:	628168		
Hole No.:	TPRT002	Depth Top [m]:	0.9
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Grey to brownish grey CLAY	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	1
Particle Density - Measured using gas jar	Mg/m³	2.51

Maximum Dry Density	Mg/m³	**1.74**

Optimum Moisture Content	%	**17**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Heavy Compaction

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7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

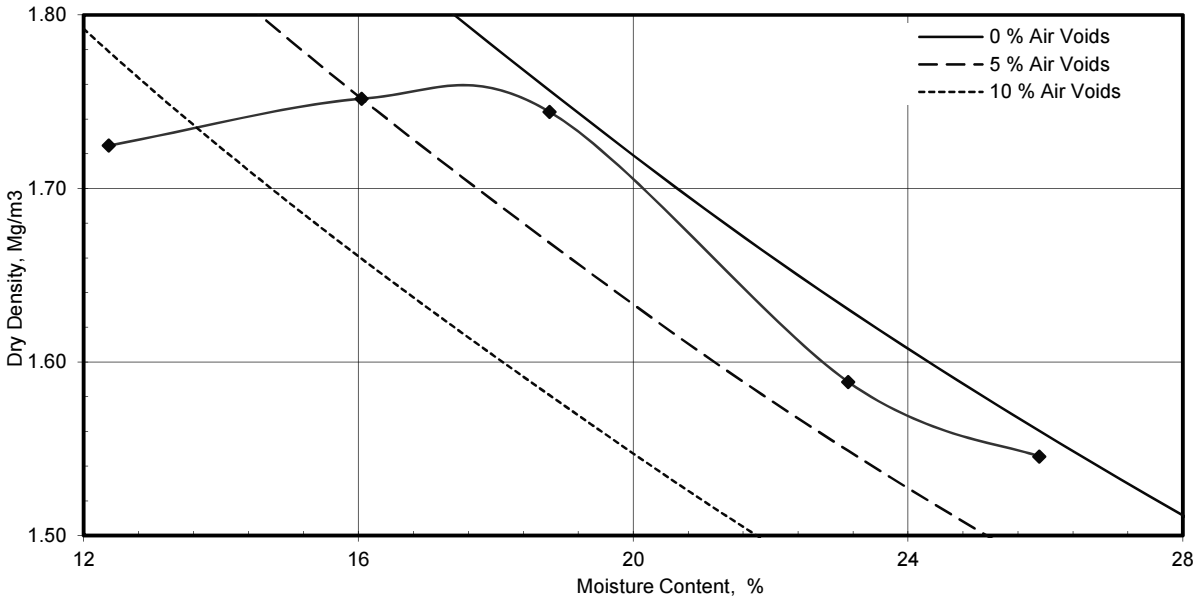
Environmental Science

Tested in accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	Not Given
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	27/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST REPORTS

Laboratory Reference:	628171		
Hole No.:	TPRT002	Depth Top [m]:	2.9
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Grey CLAY	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	2.62

Maximum Dry Density	Mg/m³	**1.75**

Optimum Moisture Content	%	**18**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Heavy Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

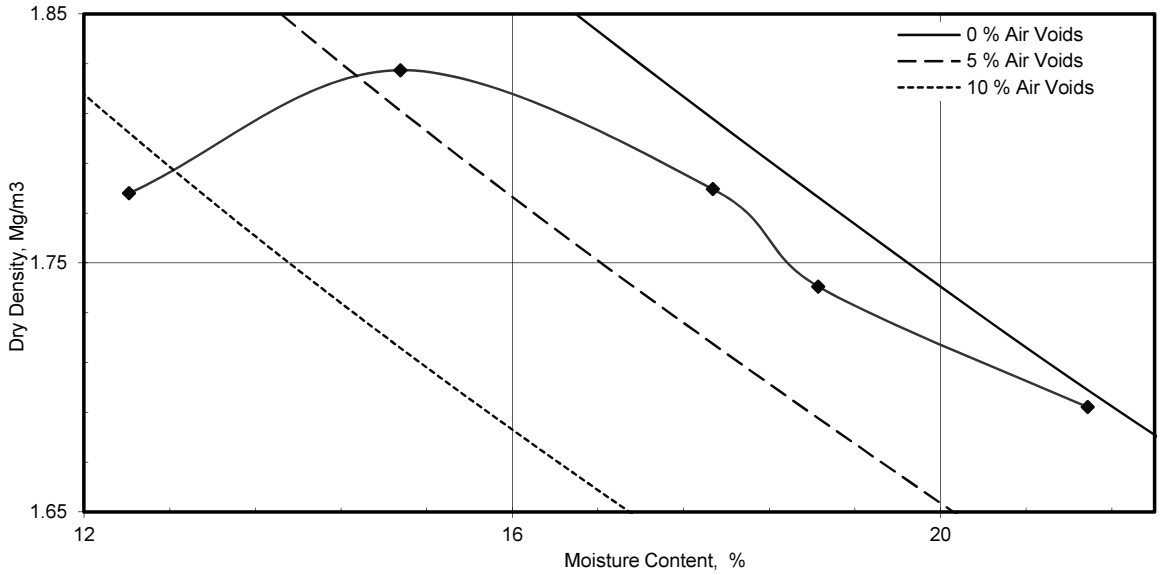
UKAS TESTING 4041

Tested in accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	Not Given
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	27/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST REPORTS

Laboratory Reference:	628176		
Hole No.:	TPG020	Depth Top [m]:	1.3
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Grey slightly gravelly CLAY with thick lamiane of yellowish brown slightly gravelly sand	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	2.67

Maximum Dry Density	Mg/m³	**1.83**

Optimum Moisture Content	%	**15**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Heavy Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

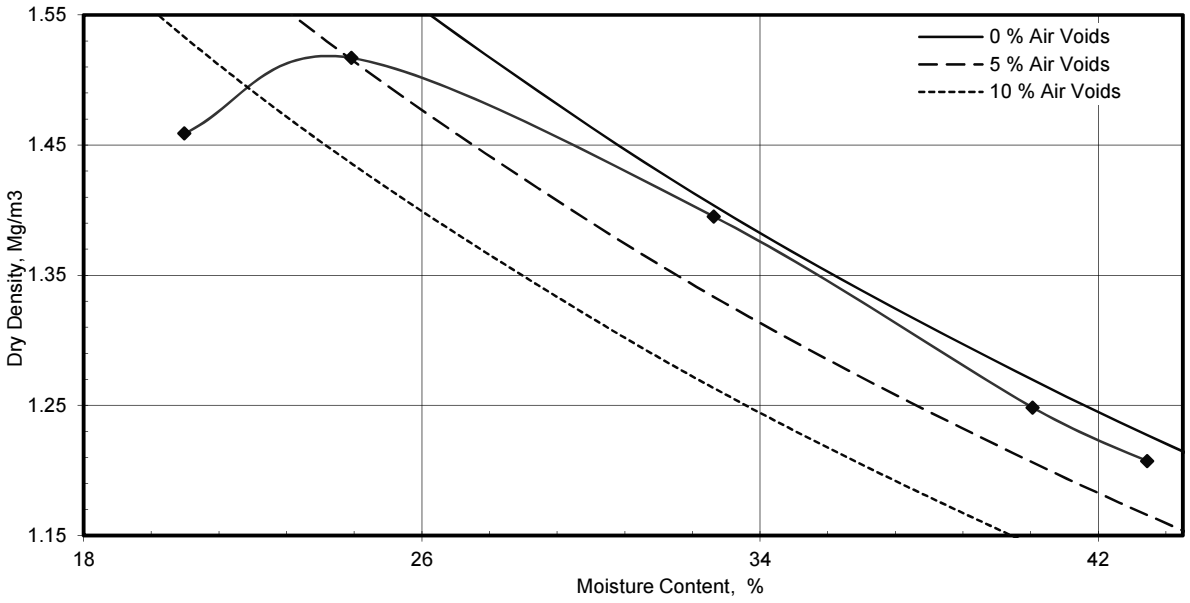
Environmental Science

Tested in accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	07/09/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	27/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST REPORTS

Laboratory Reference:	628180		
Hole No.:	TPL006	Depth Top [m]:	2.2
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Yellowish brown slightly gravelly CLAY	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	1
Particle Density - Measured using gas jar	Mg/m³	2.61

Maximum Dry Density	Mg/m³	**1.52**

Optimum Moisture Content	%	**24**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Heavy Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

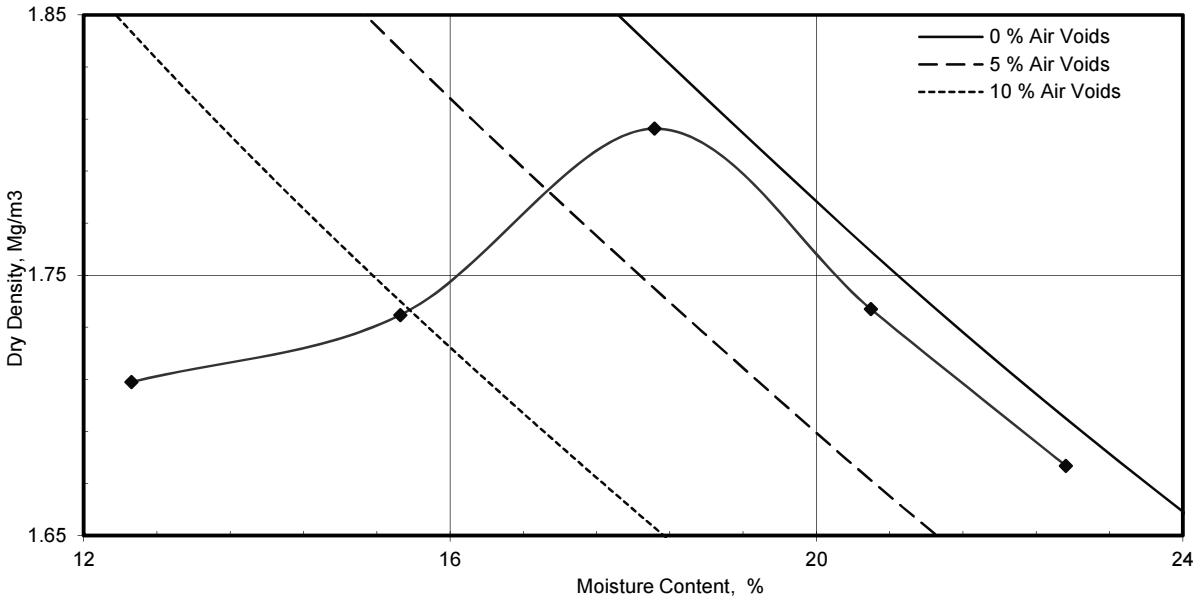
Environmental Science

Tested in accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	06/09/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	27/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST REPORTS

Laboratory Reference:	628184		
Hole No.:	TPL003	Depth Top [m]:	2.7
Sample Reference:	Not Given	Depth Base [m]:	Not Given
Sample Description:	Grey CLAY	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	2.76

Maximum Dry Density	Mg/m³	**1.81**

Optimum Moisture Content	%	**18**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Particle Density

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

Tested in Accordance with BS 1377-2: 1990: Clause 8.2

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton	Job Number:	16-27560
		Date Sampled:	22/08-07/09/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	20-28/09/2016
Site Name:	Rail Centre	Sampled By:	Not Given
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference:	Hole No.:	Sample				Soil Description at test horizon	Particle Density Mg/m3	Remarks
		Sample Reference	Depth Top [m]	Depth Base [m]	Sampe Type			
628121	TPL008	Not Given	2.5	0.0	B	Brownish grey slightly gravwelly slightly sandy CLAY with fragments of chalk	2.63	-
628128	TPT019	Not Given	1.5	0.0	B	Multicolour slightly sandy CLAY	2.75	-
628130	TPT021	Not Given	1.8	0.0	B	Greyish brown slightly sandy gravelly CLAY	2.70	-
628136	TPA007	Not Given	1.4	0.0	B	Light grey CLAY with thick laminae of yellowish brown gravelly sand	2.96	-
628137	TPA008	Not Given	0.4	0.0	B	Brown slightly gravelly slightly sandy CLAY	2.57	-
628141	TPA025	Not Given	0.8	0.0	B	Yellowish brown CLAY	2.57	-
628145	TPR003	Not Given	1.1	0.0	B	Grey sandy CLAY with rootlets	2.58	-
628146	TPR004	Not Given	1.6	0.0	B	Yellowish brown to grey slightly gravelly CLAY with fragments of chalk	2.63	-
628149	TPG033	Not Given	2.7	0.0	B	Grey CLAY	2.64	-
628157	TPG025	Not Given	2.3	0.0	B	Grey to brownish grey CLAY with fragments of gypsum crystals	2.65	-
628158	TPT008	Not Given	1.6	0.0	B	Grey to brownish grey CLAY	2.71	-
628160	TPA012	Not Given	1.8	0.0	B	Greyish brown sandy CLAY	2.68	-
628165	TPL002	Not Given	0.7	0.0	B	Yellowish brown CLAY with grass	2.53	-
628166	TPT002	Not Given	2.8	0.0	B	Greyish brown sandy CLAY	2.61	-
628168	TPRT002	Not Given	0.9	0.0	B	Grey to brownish grey CLAY	2.51	-
628171	TPRT002	Not Given	2.9	0.0	B	Grey CLAY	2.62	-
628172	TPG011	Not Given	2.8	0.0	B	Greyish brown sandy CLAY	2.63	-
628176	TPG020	Not Given	1.3	0.0	B	Grey slightly gravelly CLAY with thick lamiane of yellowish brown slightly gravelly sand	2.67	-
628180	TPL006	Not Given	2.2	0.0	B	Yellowish brown slightly gravelly CLAY	2.61	-
628184	TPL003	Not Given	2.7	0.0	B	Grey CLAY	2.76	-

Preparation Details:

Approved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Terry Stafford
Geotechnical Manager

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Particle Size Distribution

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

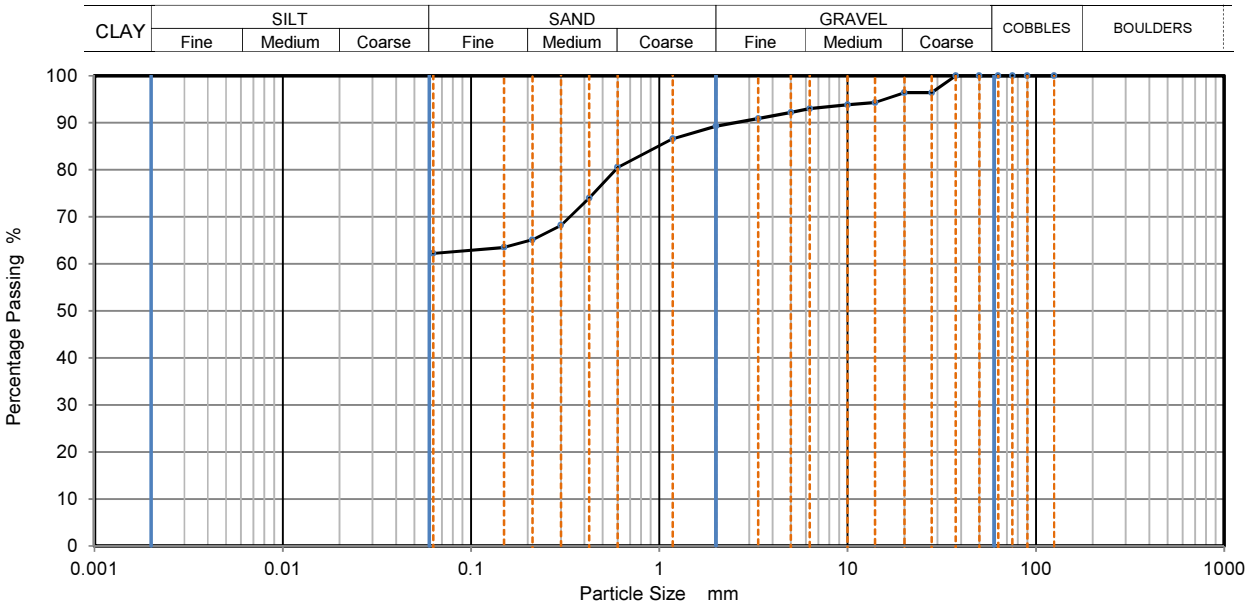
UKAS TESTING 4041

Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	07/09/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST RESULTS Laboratory Reference: 628125 Sample Reference: Not Given

Sample description:	Greyish brown slightly gravelly slightly sandy CLAY	Sample Type:	B
Location:	TPL011	Depth Top [m]:	2.7
Supplier:	Not Given	Depth Base [m]:	Not Given



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	96		
20	96		
14	94		
10	94		
6.3	93		
5	92		
3.35	91		
2	89		
1.18	87		
0.6	81		
0.425	74		
0.3	68		
0.212	65		
0.15	64		
0.063	62		

Dry Mass of sample [g]: 726

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	10.70
Sand	27.20
Fines <0.063mm	62.20

Grading Analysis		
D100	mm	37.5
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Approved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Particle Size Distribution

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

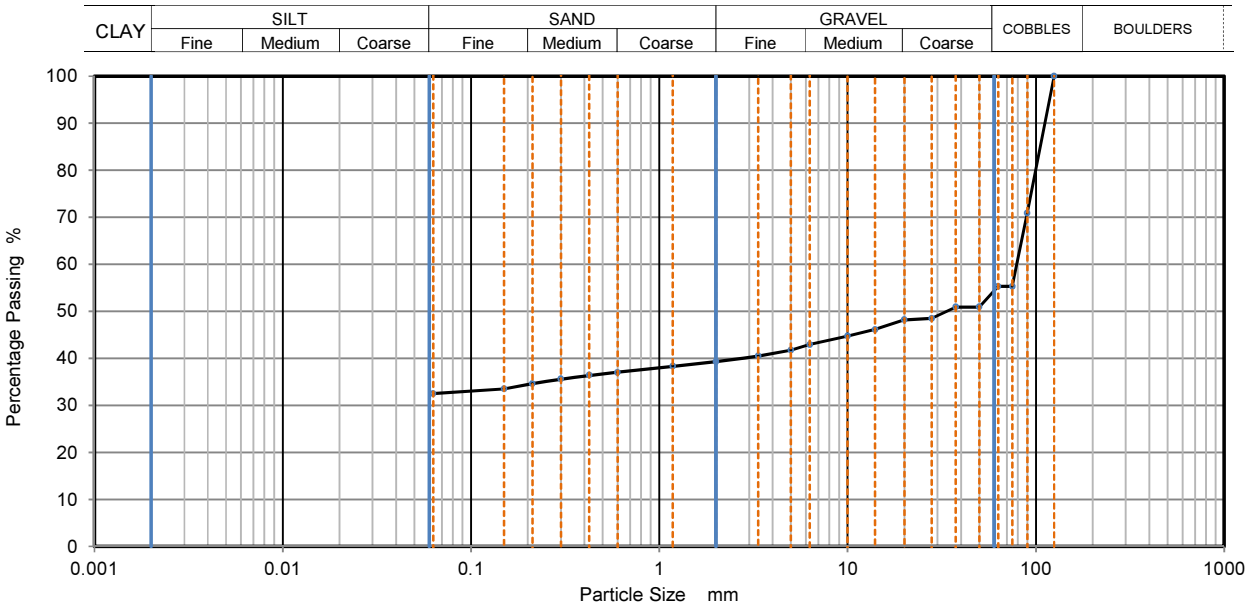
UKAS TESTING 4041

Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	31/08/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference:	628126	Sample Reference:	Not Given
Sample description:	Yellowish brown to greyish brown slightly gravelly slightly sandy CLAY with cobbles	Sample Type:	B
Location:	TPT010	Depth Top [m]:	2.4
Supplier:	Not Given	Depth Base [m]:	Not Given



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	71		
75	55		
63	55		
50	51		
37.5	51		
28	49		
20	48		
14	46		
10	45		
6.3	43		
5	42		
3.35	41		
2	39		
1.18	38		
0.6	37		
0.425	36		
0.3	36		
0.212	35		
0.15	34		
0.063	33		

Dry Mass of sample [g]: 4478

Sample Proportions	% dry mass
Very coarse	44.70
Gravel	16.10
Sand	6.80
Fines <0.063mm	32.50

Grading Analysis		
D100	mm	125
D60	mm	79.2
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377 unless noted below
Insufficient material supplied to be representative in accordance with BS1377 requirements

Approved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland."

TEST CERTIFICATE

Determination of Particle Size Distribution

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

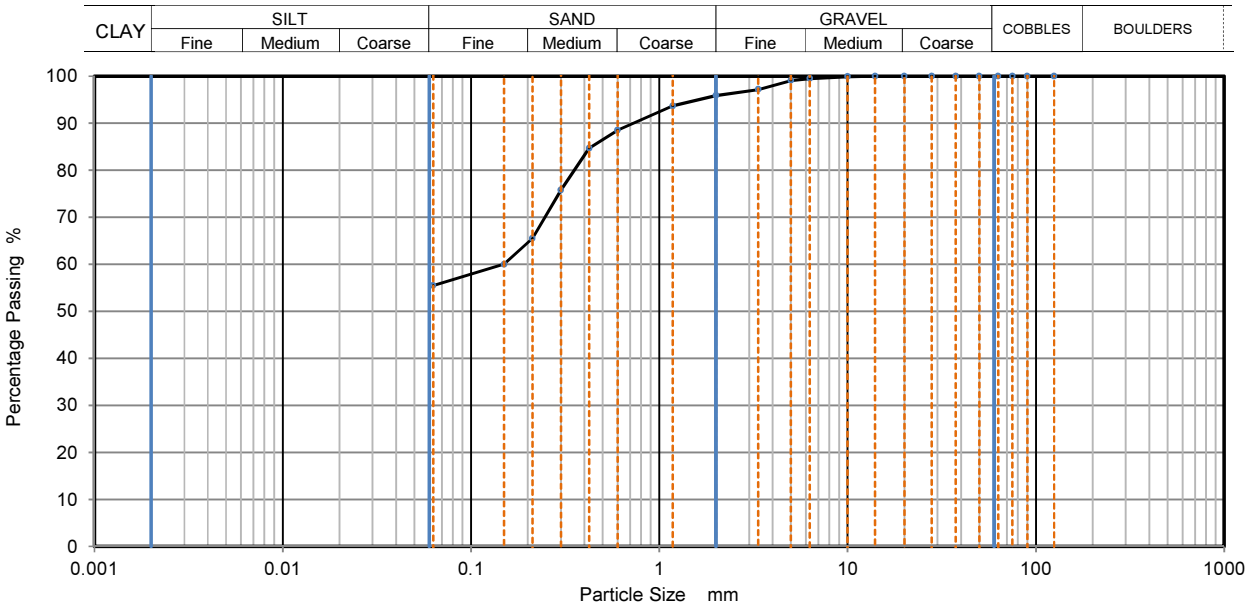
UKAS TESTING 4041

Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	01/09/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference:	628129	Sample Reference:	Not Given
Sample description:	Dark brown slightly gravelly sandy CLAY with rootlets	Sample Type:	B
Location:	TPT019	Depth Top [m]:	2.8
Supplier:	Not Given	Depth Base [m]:	Not Given



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	99		
3.35	97		
2	96		
1.18	94		
0.6	89		
0.425	85		
0.3	76		
0.212	66		
0.15	60		
0.063	56		

Dry Mass of sample [g]: 1260

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	4.10
Sand	40.40
Fines <0.063mm	55.50

Grading Analysis		
D100	mm	14
D60	mm	0.15
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Approved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Particle Size Distribution

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Croxley Green Business Park
Watford Herts WD18 8YS

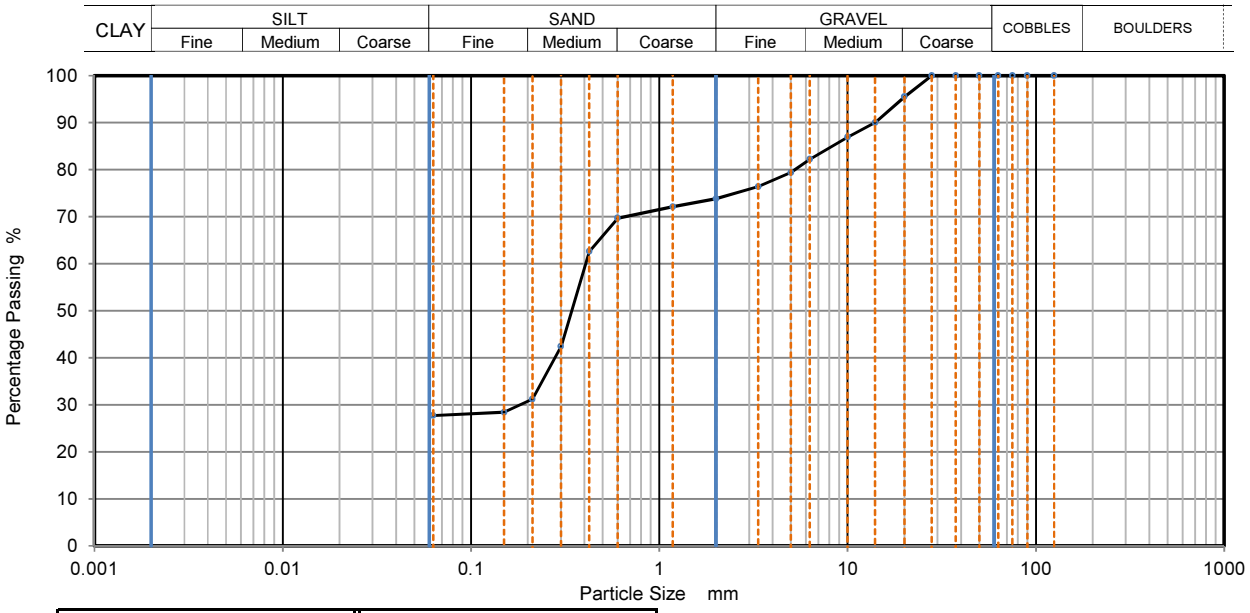
UKAS TESTING 4041

Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	06/09/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference:	628134	Sample Reference:	Not Given
Sample description:	Yellowish brown gravelly clayey fine to coarse SAND with rootlets	Sample Type:	B
Location:	TPA002	Depth Top [m]:	0.7
Supplier:	Not Given	Depth Base [m]:	Not Given



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	96		
14	90		
10	87		
6.3	82		
5	79		
3.35	76		
2	74		
1.18	72		
0.6	70		
0.425	63		
0.3	42		
0.212	31		
0.15	28		
0.063	28		

Dry Mass of sample [g]: 3149

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	26.20
Sand	46.00
Fines <0.063mm	27.70

Grading Analysis		
D100	mm	28
D60	mm	0.406
D30	mm	0.182
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Approved:

Mirosława Pytlik

PL Head of Geotechnical section

Signed:

Sushil Sharda

Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

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TEST CERTIFICATE

Determination of Particle Size Distribution

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Croxley Green Business Park
Watford Herts WD18 8YS

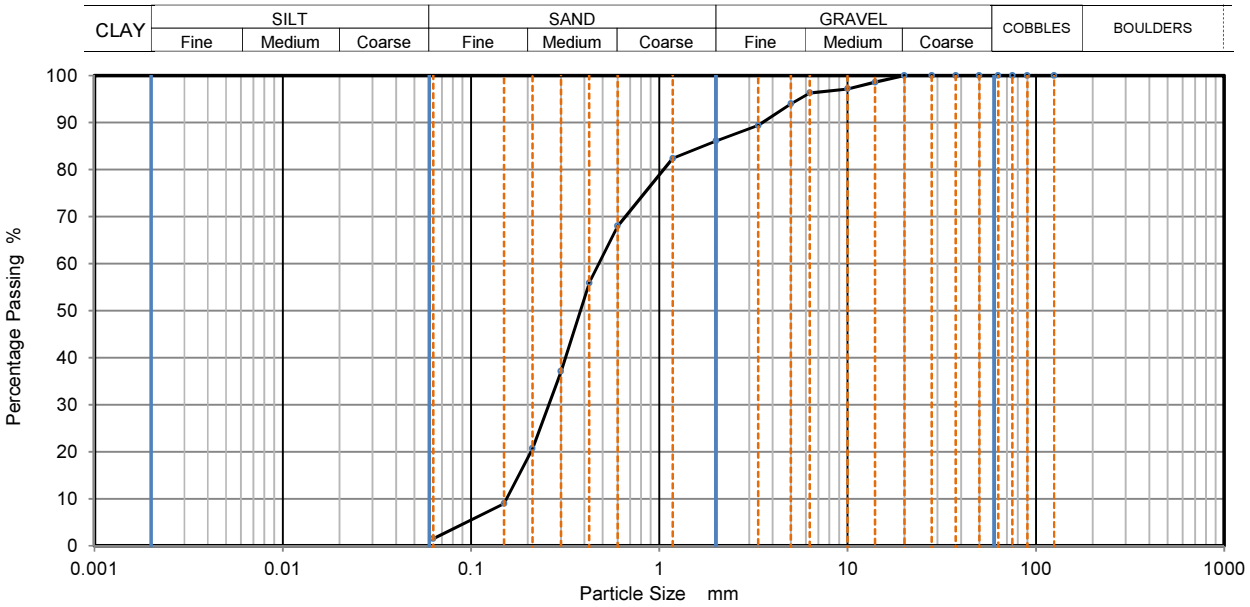
UKAS TESTING 4041

Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	23/08/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference:	628138	Sample Reference:	Not Given
Sample description:	Yellowish brown slightly clayey gravelly fine to coarse SAND	Sample Type:	B
Location:	TPA010	Depth Top [m]:	0.7
Supplier:	Not Given	Depth Base [m]:	Not Given



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	97		
6.3	96		
5	94		
3.35	89		
2	86		
1.18	82		
0.6	68		
0.425	56		
0.3	37		
0.212	21		
0.15	9		
0.063	2		

Dry Mass of sample [g]: 1204

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	13.90
Sand	84.50
Fines <0.063mm	1.50

Grading Analysis		
D100	mm	20
D60	mm	0.478
D30	mm	0.258
D10	mm	0.155
Uniformity Coefficient		3.1
Curvature Coefficient		0.9

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Approved:

Mirosława Pytlik

PL Head of Geotechnical section

Signed:

Sushil Sharda

Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Particle Size Distribution

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Croxley Green Business Park
Watford Herts WD18 8YS

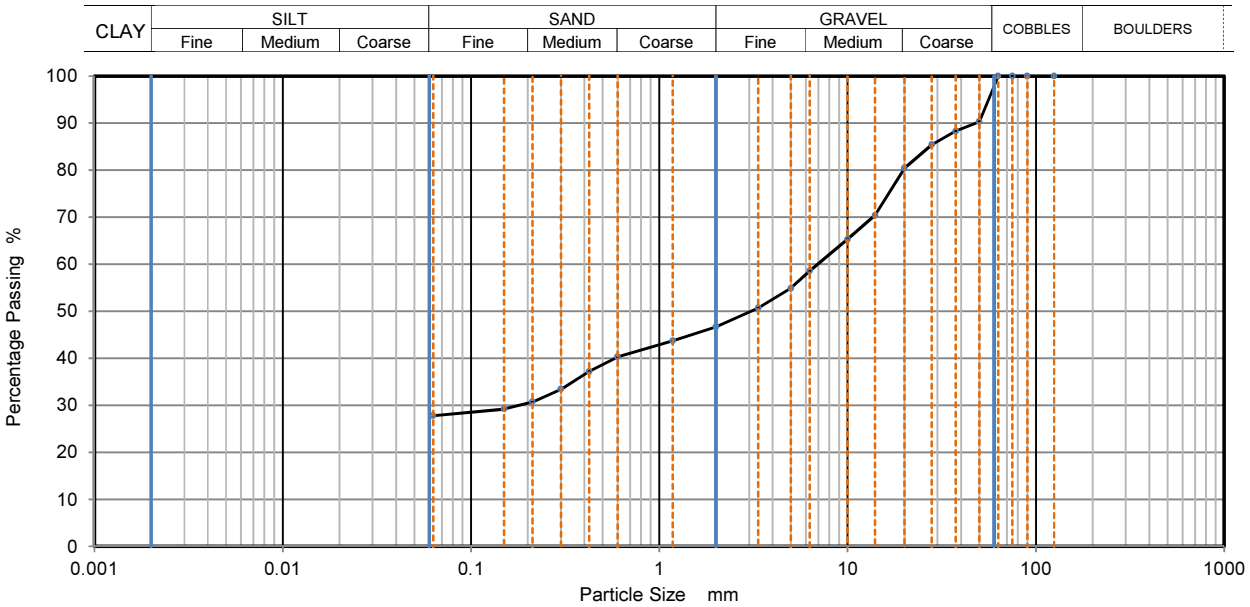
UKAS TESTING 4041

Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	23/08/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference:	628139	Sample Reference:	Not Given
Sample description:	Yellowish brown sandy clayey fine to coarse GRAVEL	Sample Type:	B
Location:	TPA010	Depth Top [m]:	1.5
Supplier:	Not Given	Depth Base [m]:	Not Given



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	90		
37.5	88		
28	85		
20	80		
14	70		
10	65		
6.3	59		
5	55		
3.35	51		
2	47		
1.18	44		
0.6	40		
0.425	37		
0.3	33		
0.212	31		
0.15	29		
0.063	28		

Dry Mass of sample [g]: 4558

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	53.30
Sand	18.90
Fines <0.063mm	27.80

Grading Analysis		
D100	mm	63
D60	mm	6.94
D30	mm	0.18
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377 unless noted below
Insufficient material supplied to be representative in accordance with BS1377 requirements

Approved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Particle Size Distribution

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

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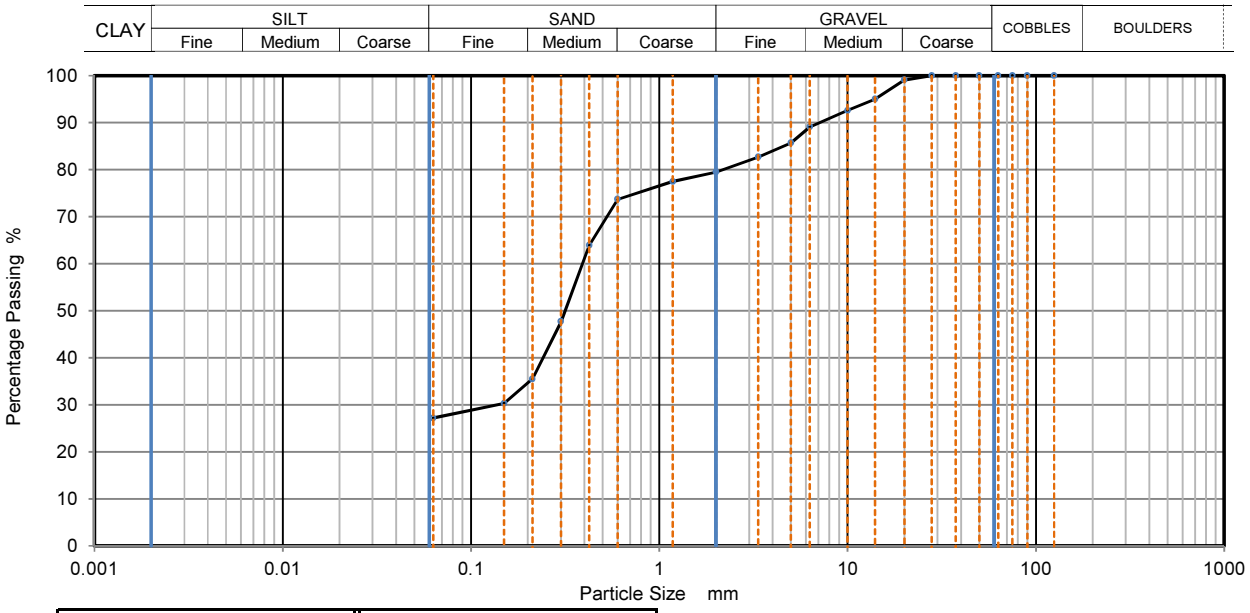
Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	04/09/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST RESULTS Laboratory Reference: 628142 Sample Reference: Not Given

Sample description: Brown slightly gravelly clayey fine to coarse SAND Sample Type: B

Location: TPA028 Depth Top [m]: 1.3

Supplier: Not Given Depth Base [m]: Not Given



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	99		
14	95		
10	93		
6.3	89		
5	86		
3.35	83		
2	80		
1.18	78		
0.6	74		
0.425	64		
0.3	48		
0.212	36		
0.15	30		
0.063	27		

Dry Mass of sample [g]: 2285

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	20.50
Sand	52.40
Fines <0.063mm	27.20

Grading Analysis		
D100	mm	28
D60	mm	0.391
D30	mm	0.138
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Approved:

Mirosława Pytlik

PL Head of Geotechnical section

Signed:

Sushil Sharda

Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Particle Size Distribution

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

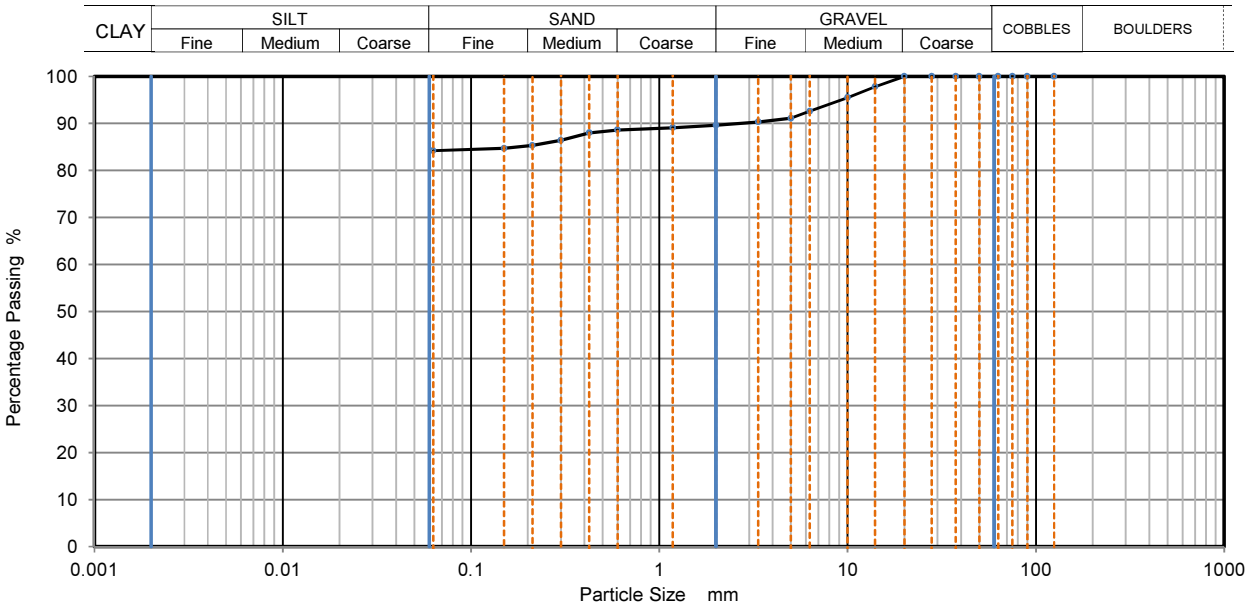
UKAS TESTING 4041

Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	23/08/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST RESULTS Laboratory Reference: 628147 Sample Reference: Not Given

Sample description:	Grey to yellowish brown slightly gravelly slightly sandy CLAY with grass	Sample Type:	B
Location:	TPA011	Depth Top [m]:	1.6
Supplier:	Not Given	Depth Base [m]:	Not Given



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	98		
10	96		
6.3	93		
5	91		
3.35	90		
2	90		
1.18	89		
0.6	89		
0.425	88		
0.3	86		
0.212	85		
0.15	85		
0.063	84		

Dry Mass of sample [g]: 904

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	10.40
Sand	5.40
Fines <0.063mm	84.20

Grading Analysis		
D100	mm	20
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Approved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

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TEST CERTIFICATE

Determination of Particle Size Distribution

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

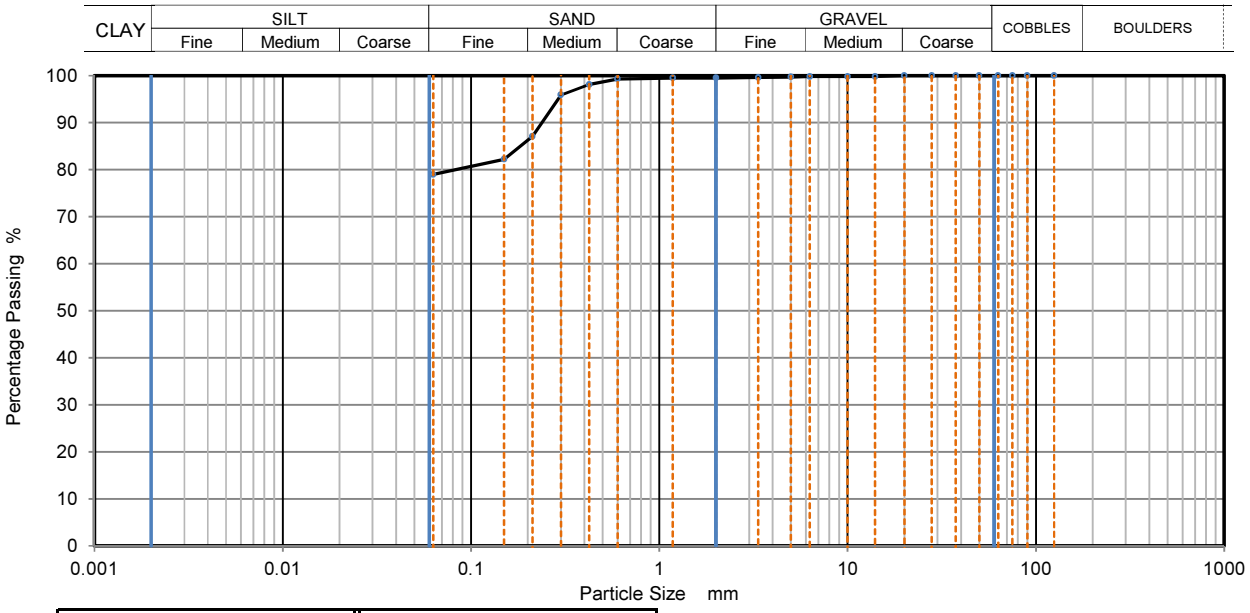
4041

Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	26/08/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference:	628148	Sample Reference:	Not Given
Sample description:	Greyish brown slightly gravelly slightly sandy CLAY	Sample Type:	B
Location:	TPG026	Depth Top [m]:	1.1
Supplier:	Not Given	Depth Base [m]:	Not Given



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	99		
0.425	98		
0.3	96		
0.212	87		
0.15	82		
0.063	79		

Dry Mass of sample [g]: 873

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	0.50
Sand	20.60
Fines <0.063mm	79.00

Grading Analysis		
D100	mm	20
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Approved:

Mirosława Pytlik

PL Head of Geotechnical section

Signed:

Sushil Sharda

Technical Manager
(Geotechnical Division)

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TEST CERTIFICATE

Determination of Particle Size Distribution

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7 Woodshots Meadow
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Watford Herts WD18 8YS

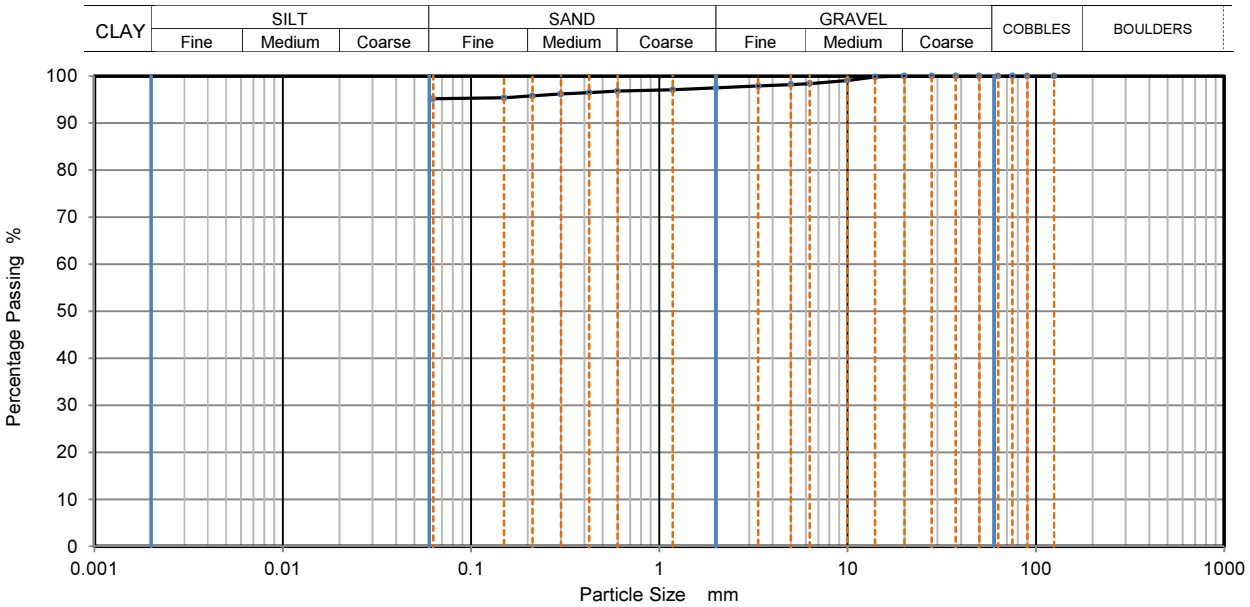
UKAS TESTING 4041

Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	25/08/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST RESULTS Laboratory Reference: 628150

Sample description:	Greyish brown slightly gravelly slightly sandy CLAY	Sample Reference:	Not Given
		Sample Type:	B
Location:	TPG058	Depth Top [m]:	3
Supplier:	Not Given	Depth Base [m]:	Not Given



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	99		
6.3	98		
5	98		
3.35	98		
2	98		
1.18	97		
0.6	97		
0.425	97		
0.3	96		
0.212	96		
0.15	95		
0.063	95		

Dry Mass of sample [g]: 1026

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	2.50
Sand	2.30
Fines <0.063mm	95.20

Grading Analysis		
D100	mm	20
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks
Preparation and testing in accordance with BS1377 unless noted below

Approved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

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TEST CERTIFICATE

Determination of Particle Size Distribution

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

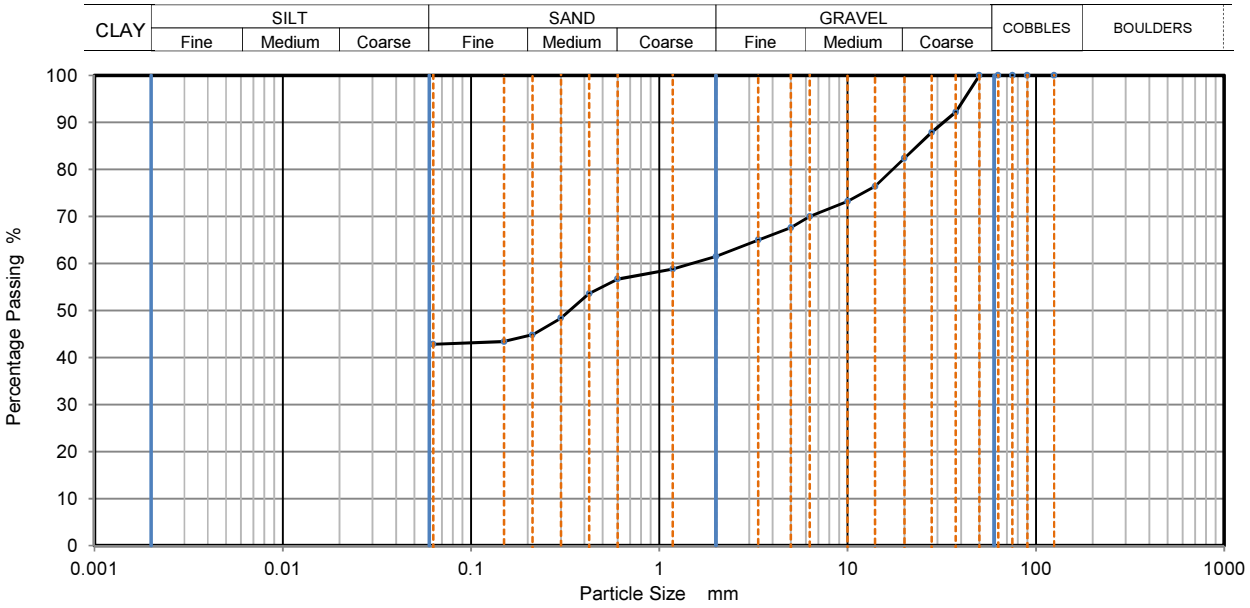
UKAS TESTING 4041

Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	06/09/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST RESULTS Laboratory Reference: 628155 Sample Reference: Not Given

Sample description:	Brown slightly sandy gravelly CLAY	Sample Type:	B
Location:	TPL005	Depth Top [m]:	0.55
Supplier:	Not Given	Depth Base [m]:	Not Given



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	92		
28	88		
20	82		
14	76		
10	73		
6.3	70		
5	68		
3.35	65		
2	62		
1.18	59		
0.6	57		
0.425	54		
0.3	48		
0.212	45		
0.15	43		
0.063	43		

Dry Mass of sample [g]: 3971

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	38.50
Sand	18.70
Fines <0.063mm	42.80

Grading Analysis		
D100	mm	50
D60	mm	1.49
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377 unless noted below
Insufficient material supplied to be representative in accordance with BS1377 requirements

Approved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland."

TEST CERTIFICATE

Determination of Particle Size Distribution

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

4041

Tested in Accordance with BS1377:Part 2:1990, clause 9.2

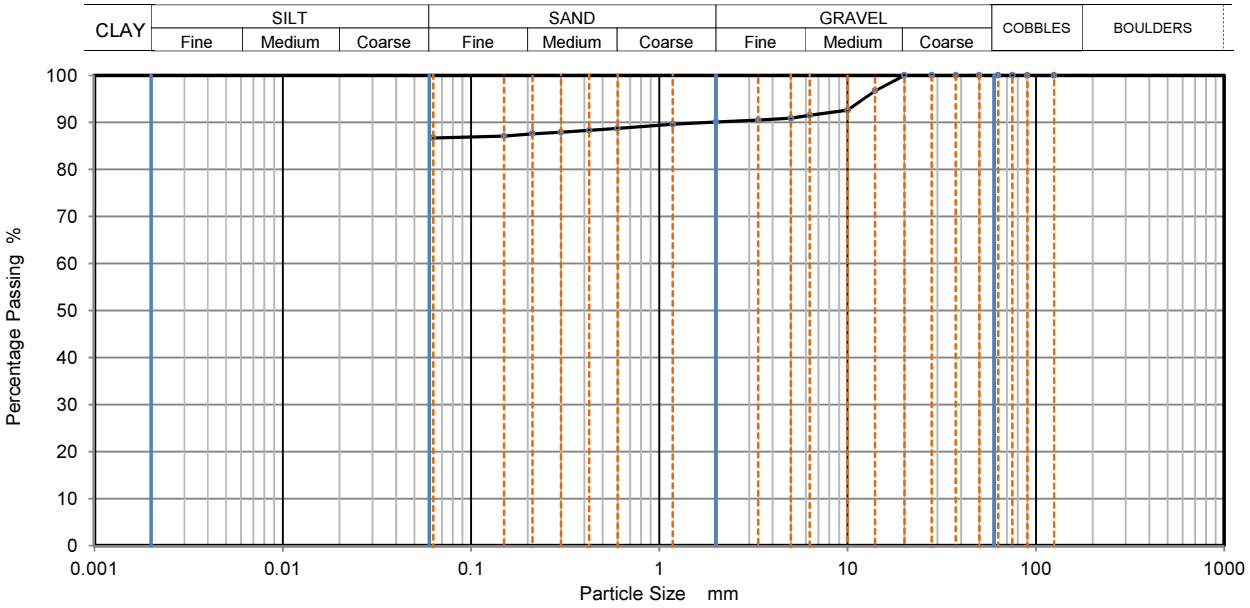
Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	Not Given
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST RESULTS Laboratory Reference: 628159 Sample Reference: Not Given

Sample description: Greyish brown slightly gravelly slightly sandy CLAY. Sample Type: B

Location: TPR013 Depth Top [m]: 2.7

Supplier: Not Given Depth Base [m]: Not Given



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	97		
10	93		
6.3	92		
5	91		
3.35	91		
2	90		
1.18	90		
0.6	89		
0.425	88		
0.3	88		
0.212	88		
0.15	87		
0.063	87		

Dry Mass of sample [g]: 1185

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	9.90
Sand	3.50
Fines <0.063mm	86.70

Grading Analysis		
D100	mm	20
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

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Approved:

Mirosława Pytlik

PL Head of Geotechnical section

Signed:

Sushil Sharda

Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Particle Size Distribution

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

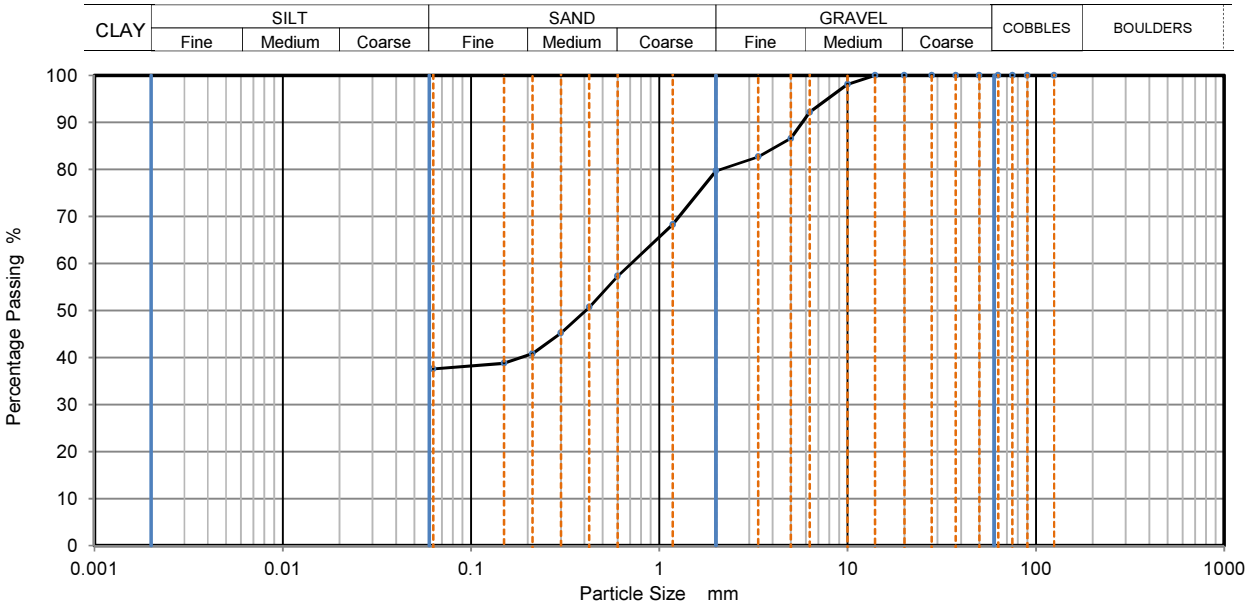
UKAS TESTING 4041

Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	Not Given
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST RESULTS Laboratory Reference: 628167 Sample Reference: Not Given

Sample description:	Greyish brown gravelly sandy CLAY	Sample Type:	B
Location:	TPG059	Depth Top [m]:	2
Supplier:	Not Given	Depth Base [m]:	Not Given



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	98		
6.3	92		
5	87		
3.35	83		
2	80		
1.18	68		
0.6	57		
0.425	51		
0.3	45		
0.212	41		
0.15	39		
0.063	38		

Dry Mass of sample [g]: 955

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	20.30
Sand	42.00
Fines <0.063mm	37.60

Grading Analysis		
D100	mm	14
D60	mm	0.709
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

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Approved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

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TEST CERTIFICATE

Determination of Particle Size Distribution

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

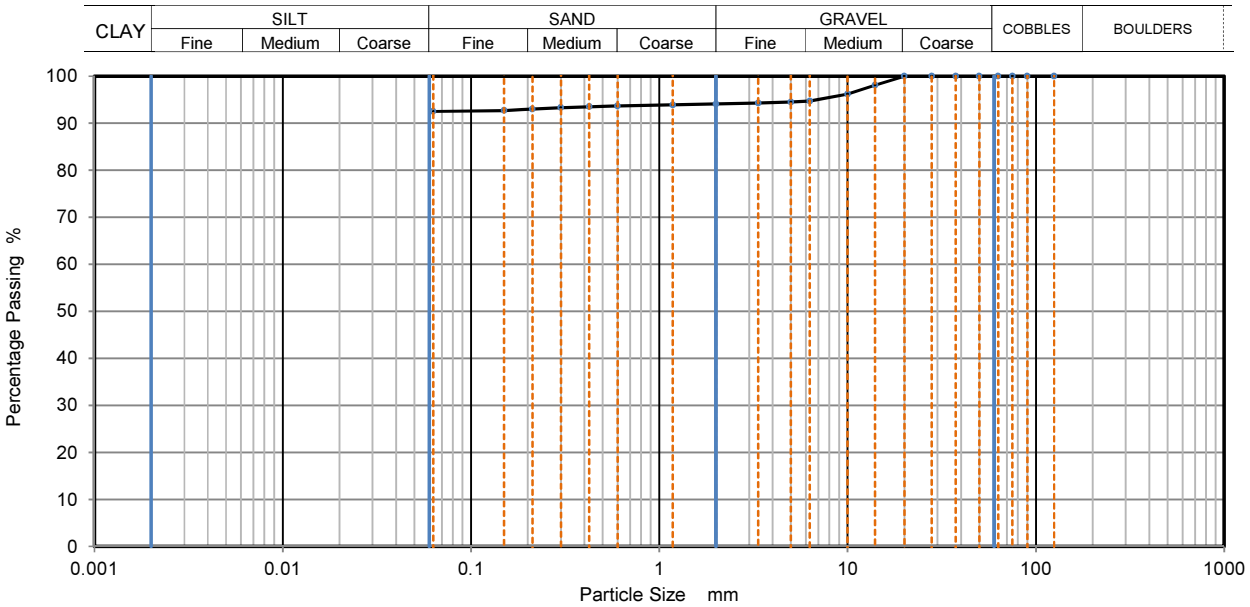
UKAS TESTING 4041

Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	Not Given
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference:	628174	Sample Reference:	Not Given
Sample description:	Greyish brown slightly gravelly slightly sandy CLAY. Gravel is mudstone	Sample Type:	B
Location:	TPG020	Depth Top [m]:	2.8
Supplier:	Not Given	Depth Base [m]:	Not Given



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	98		
10	96		
6.3	95		
5	95		
3.35	94		
2	94		
1.18	94		
0.6	94		
0.425	94		
0.3	93		
0.212	93		
0.15	93		
0.063	93		

Dry Mass of sample [g]: 986

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	5.90
Sand	1.60
Fines <0.063mm	92.50

Grading Analysis		
D100	mm	20
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

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Approved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

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TEST CERTIFICATE

Determination of Particle Size Distribution

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

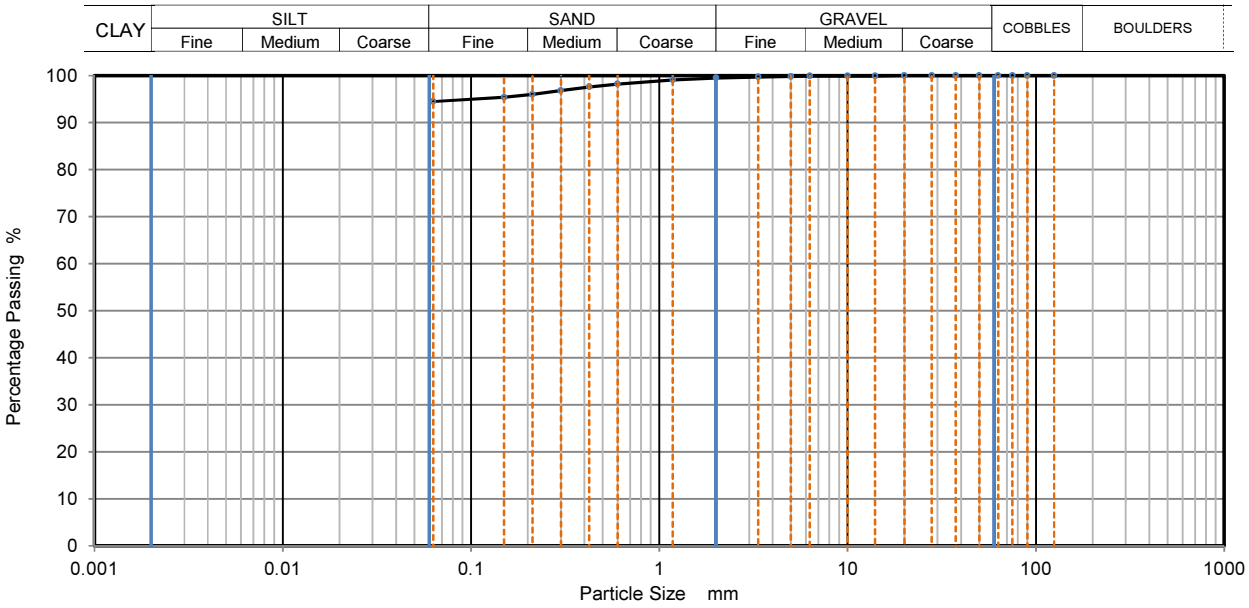
UKAS TESTING 4041

Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	Not Given
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference:	628175	Sample Reference:	Not Given
Sample description:	Greyish brown slightly gravelly slightly sandy CLAY	Sample Type:	B
Location:	TPA005	Depth Top [m]:	2.4
Supplier:	Not Given	Depth Base [m]:	Not Given



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	99		
0.6	98		
0.425	98		
0.3	97		
0.212	96		
0.15	95		
0.063	95		

Dry Mass of sample [g]: 886

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	0.50
Sand	5.00
Fines <0.063mm	94.50

Grading Analysis		
D100	mm	20
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

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Approved:

Mirosława Pytlik

PL Head of Geotechnical section

Signed:

Sushil Sharda

Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

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TEST CERTIFICATE

Determination of Particle Size Distribution

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

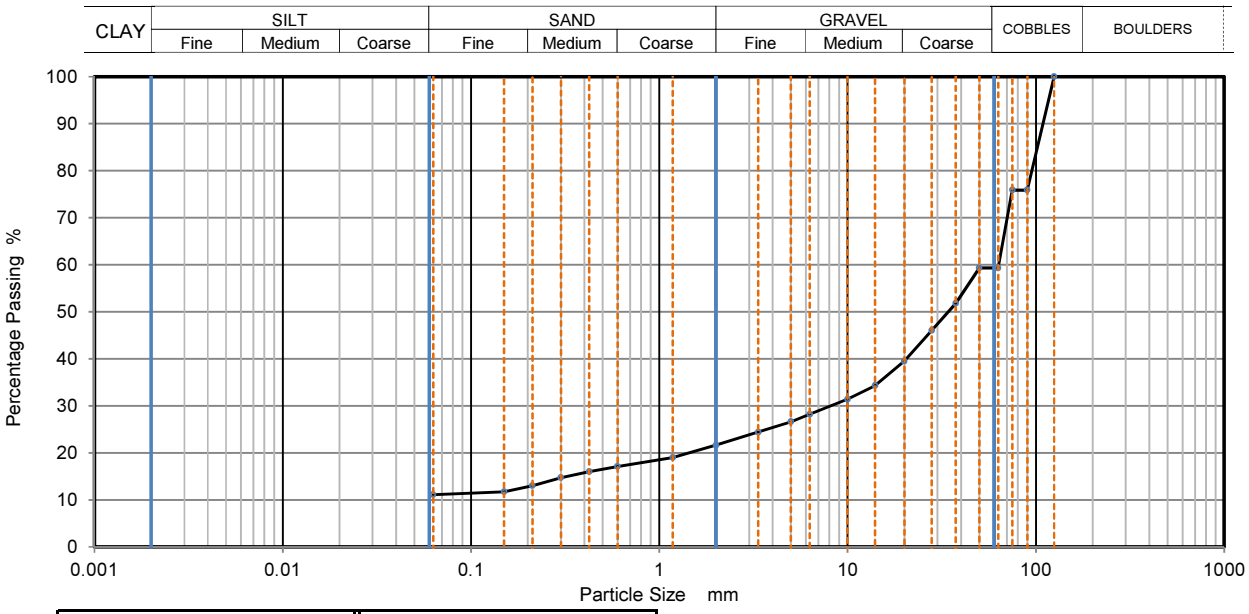
UKAS TESTING 4041

Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	07/09/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference:	628181	Sample Reference:	Not Given
Sample description:	Yellowish brown gravelly sandy CLAY with occasional cobbles and fragments of wood	Sample Type:	B
Location:	TPL006	Depth Top [m]:	2.7
Supplier:	Not Given	Depth Base [m]:	Not Given



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	76		
75	76		
63	59		
50	59		
37.5	52		
28	46		
20	40		
14	34		
10	31		
6.3	28		
5	27		
3.35	24		
2	22		
1.18	19		
0.6	17		
0.425	16		
0.3	15		
0.212	13		
0.15	12		
0.063	11		

Dry Mass of sample [g]: 7153

Sample Proportions	% dry mass
Very coarse	40.70
Gravel	37.70
Sand	10.50
Fines <0.063mm	11.10

Grading Analysis		
D100	mm	125
D60	mm	63.4
D30	mm	8.14
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377 unless noted below
Insufficient material supplied to be representative in accordance with BS1377 requirements

Approved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Particle Size Distribution

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

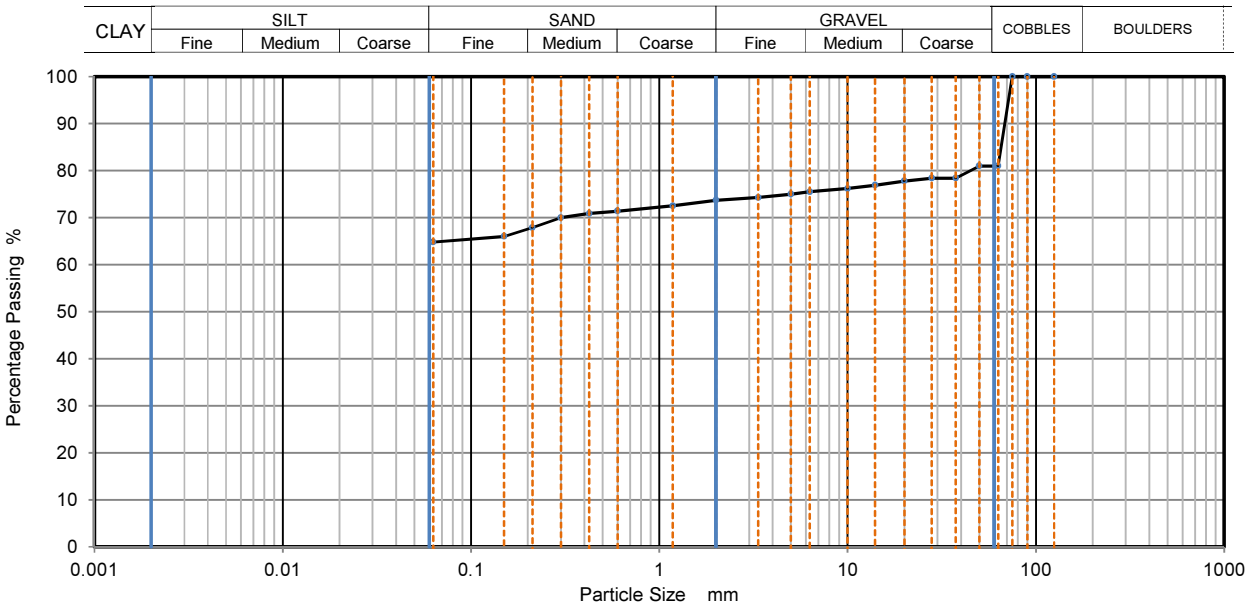
UKAS TESTING 4041

Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-27560
		Date Sampled:	07/09/2016
		Date Received:	09/09/2016
Contact:	Richard Brown	Date Tested:	23/09/2016
Site Name:	Rail Centre	Sampled By:	RB/AO/WS
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference:	628183	Sample Reference:	Not Given
Sample description:	Grey slightly gravelly slightly sandy CLAY with cobbles	Sample Type:	B
Location:	TPA025	Depth Top [m]:	2.6
Supplier:	Not Given	Depth Base [m]:	Not Given



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	81		
50	81		
37.5	78		
28	78		
20	78		
14	77		
10	76		
6.3	76		
5	75		
3.35	74		
2	74		
1.18	73		
0.6	71		
0.425	71		
0.3	70		
0.212	68		
0.15	66		
0.063	65		

Dry Mass of sample [g]: 3496

Sample Proportions	% dry mass
Very coarse	19.00
Gravel	7.40
Sand	8.90
Fines <0.063mm	64.80

Grading Analysis		
D100	mm	75
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377 unless noted below
Insufficient material supplied to be representative in accordance with BS1377 requirements

Approved:

Mirosława Pytlik
PL Head of Geotechnical section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 29/09/2016

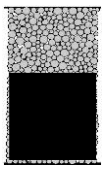
for and on behalf of i2 Analytical Ltd

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Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details				
 *sketch showing specimen location in original sample*	Depth	2.00		
	Description	Yellowish brown CLAY with thin laminae of grey clay		
	Type	U		
	Initial Sample Length	L_0	(mm)	198.3
	Initial Sample Diameter	D_0	(mm)	98.5
	Initial Sample Weight	W_0	(gr)	2968.2
	Bulk Density	ρ_0	(Mg/m3)	1.96
	Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

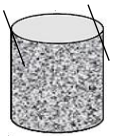
Initial Cell Pressure	σ_3	(kPa)	40
Strain Rate	m_s	(mm/min)	3.96600
MembraneThickness	m_b	(mm)	0.19
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	32
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.49
Initial Voids Ratio	e_0	.	0.78
Initial Degree of Saturation	S_o	(%)	100

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	127
MembraneCorrection	m_c	(kPa)	0.593
Strain At Max Stress	$\varepsilon_f\%$	(%)	13.66
Shear Strength	c_u	(kPa)	64
Final Moisture	$\omega_f\%$	(%)	32
Final Dry Density	ρ_{df}	(Mg/m3)	1.49
Final Voids Ratio	e_f	.	0.78
Final Degree of Saturation	S_f	(%)	100.0

Notes





Failure Sketch

(surface inclination)

Test Method	BS1377-7 : 1900 Clause 8			Test Name	628152
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	23/09/2016
Site Reference	Rail Central			Borehole	BHR003
Jobfile	16-27560			Sample	628152
Client	Hydrock Consultants			Depth	2.00
Operator	bielatowiczs	Checked	pytlikm	Approved	pytlikm

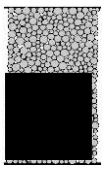
i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS
i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth	1.20		
Description	Yellowish brown CLAY		
Type	U		
Initial Sample Length	L_0	(mm)	197.1
Initial Sample Diameter	D_0	(mm)	98.7
Initial Sample Weight	W_0	(gr)	3018.8
Bulk Density	ρ_0	(Mg/m3)	2.00
Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

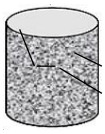
Initial Cell Pressure	σ_3	(kPa)	24
Strain Rate	m_S	(mm/min)	3.94200
MembraneThickness	m_b	(mm)	0.31
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	26
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.59
Initial Voids Ratio	e_0	.	0.66
Initial Degree of Saturation	S_o	(%)	100

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	194
MembraneCorrection	m_C	(kPa)	0.824
Strain At Max Stress	$\varepsilon_f\%$	(%)	11.30
Shear Strength	c_U	(kPa)	97
Final Moisture	$\omega_f\%$	(%)	26
Final Dry Density	ρ_{df}	(Mg/m3)	1.59
Final Voids Ratio	e_f	.	0.66
Final Degree of Saturation	S_f	(%)	100.0



Notes



Failure Sketch

(surface inclination)

Test Method	BS1377-7 : 1900 Clause 8			Test Name	628153
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	23/09/2016
Site Reference	Rail Central			Borehole	BHR004
Jobfile	16-27560			Sample	628153
Client	Hydrock Consultants			Depth	1.20
Operator	bielatowiczs	Checked	pytlikm	Approved	pytlikm

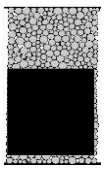
i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS
i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth	1.20		
Description	Light brown CLAY		
Type	U		
Initial Sample Length	L_0	(mm)	199.4
Initial Sample Diameter	D_0	(mm)	98.6
Initial Sample Weight	W_0	(gr)	2926.2
Bulk Density	ρ_0	(Mg/m3)	1.92
Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

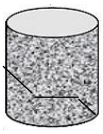
Initial Cell Pressure	σ_3	(kPa)	24
Strain Rate	m_s	(mm/min)	3.98760
MembraneThickness	m_b	(mm)	0.24
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	17
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.65
Initial Voids Ratio	e_0	.	0.61
Initial Degree of Saturation	S_o	(%)	73

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	77
MembraneCorrection	m_c	(kPa)	0.321
Strain At Max Stress	$\varepsilon_f\%$	(%)	4.46
Shear Strength	c_u	(kPa)	39
Final Moisture	$\omega_f\%$	(%)	17
Final Dry Density	ρ_{df}	(Mg/m3)	1.65
Final Voids Ratio	e_f	.	0.61
Final Degree of Saturation	S_f	(%)	72.9



Notes



Failure Sketch

(surface inclination)

Test Method	BS1377-7 : 1900 Clause 8			Test Name	628154
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	23/09/2016
Site Reference	Rail Central			Borehole	BHR001
Jobfile	16-27560			Sample	628154
Client	Hydrock Consultants			Depth	1.20
Operator	bielatowiczs	Checked	pytlikm	Approved	pytlikm

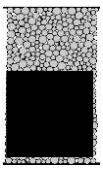
i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS
i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth	1.20		
Description	Yellowish brown to orange slightly sandy CLAY with laminae of grey CLAY		
Type	D		
Initial Sample Length	L_0	(mm)	197.6
Initial Sample Diameter	D_0	(mm)	98.8
Initial Sample Weight	W_0	(gr)	3170.7
Bulk Density	ρ_0	(Mg/m3)	2.09
Particle Density	ρ_s	(Mg/m3)	2.65

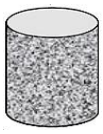
Initial Conditions

Initial Cell Pressure	σ_3	(kPa)	24
Strain Rate	m_S	(mm/min)	3.95160
MembraneThickness	m_b	(mm)	0.27
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	20
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.74
Initial Voids Ratio	e_0	.	0.52
Initial Degree of Saturation	S_o	(%)	100

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	144
MembraneCorrection	m_C	(kPa)	1.032
Strain At Max Stress	$\varepsilon_f\%$	(%)	19.98
Shear Strength	c_U	(kPa)	72
Final Moisture	$\omega_f\%$	(%)	20
Final Dry Density	ρ_{df}	(Mg/m3)	1.74
Final Voids Ratio	e_f	.	0.52
Final Degree of Saturation	S_f	(%)	100.0





Failure Sketch

(surface inclination)

Notes

No visible damage

Test Method	BS1377-7 : 1900 Clause 8			Test Name	628178
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	23/09/2016
Site Reference	Rail Central			Borehole	BHG005
Jobfile	16-27560			Sample	628178
Client	Hydrock Consultants			Depth	1.20
Operator	bielatowiczs	Checked	pytlikm	Approved	pytlikm

i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS

i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

TEST CERTIFICATE

Determination of Moisture Content

Tested in Accordance with BS 1377-2:1990: Clause 3.2

4041

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-28788
		Date Sampled:	01/09/2016
		Date Received:	26/09/2016
Contact:	Richard Brown	Date Tested:	06/10/2016
Site Name:	Rail Central	Sampled By:	Not Given
Site Address:	Not Given		

Test results

Laboratory Reference	Sample Reference	Location	Depth Top [m]	Depth Base [m]	Sample Type	Description	Moisture Content [%]
635648	UT	BHL003	1	Not Given	U	Yellowish brown slightly sandy CLAY with thin laminae of grey clay	26
635649	UT	BHL003	5	Not Given	U	Greyish brown CLAY	22
635650	U (p)	BHA002	2	Not Given	U	Yellowish brown to grey CLAY	32
635651	U (p)	BHA002	4	Not Given	U	Yellowish brown to orangish brown slightly sandy CLAY	23
635652	UT	BHL005	1.2	Not Given	U	Light brown CLAY with thin laminae of grey clay	28
635653	U (p)	BHA006	2	Not Given	U	Yellowish brown to brownish grey CLAY	28
635654	U (p)	BHA006	4	Not Given	U	Brownish grey CLAY with pockets of yellowish brown sand	30
635655	UT	BHG011	2.2	Not Given	U	Yellowish brown slightly sandy CLAY	21
635656	U (p)	BHA005	1.2	Not Given	U	Yellowish brown CLAY	38
635657	U	BHA013	4	Not Given	U	Greyish brown CLAY	24

Remarks

Approved:

Mirosława Pytlik
PL Head of
Geotechnical Section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 11/10/2016

for and on behalf of i2 Analytical Ltd

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The results included within the report are representative of the samples submitted for analysis.
The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland."

TEST CERTIFICATE

Determination of Moisture Content

Tested in Accordance with BS 1377-2:1990: Clause 3.2

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-28788
		Date Sampled:	01/09/2016
		Date Received:	26/09/2016
Contact:	Richard Brown	Date Tested:	06/10/2016
Site Name:	Rail Central	Sampled By:	Not Given
Site Address:	Not Given		

Test results

Laboratory Reference	Sample Reference	Location	Depth Top [m]	Depth Base [m]	Sample Type	Description	Moisture Content [%]
635658	U	BHG007	2	Not Given	U	Brownish grey CLAY with pockets of yellowish brown sand	27
635659	U	BHG007	4	Not Given	U	Brownish grey CLAY with pockets of yellowish brown sand	22
635660	U	BHG010	2	Not Given	U	Greyish brown CLAY with thin laminae of yellowish brown sand	26
635661	U	BHG023	2	Not Given	U	Dark yellow slightly sandy CLAY	29
635662	UT	BHRT001	2.2	Not Given	U	Greyish brown to yellowish brown CLAY	25
635663	U	BHRT001	4.3	Not Given	U	Greyish brown CLAY	21
635664	U	BHA014	2	Not Given	U	Orange slightly gravelly clayey SAND	18
635665	U	BHG019	2	Not Given	U	Yellowish brown CLAY	25
635666	UT	BHG012	3.5	Not Given	U	Brownish grey silty CLAY	17
635667	UT	BHG012	5.5	Not Given	U	Brownish grey silty CLAY	18

Remarks

Approved:

Mirosława Pytlik
PL Head of
Geotechnical Section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 11/10/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Moisture Content

Tested in Accordance with BS 1377-2:1990: Clause 3.2

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-28788
		Date Sampled:	01/09/2016
		Date Received:	26/09/2016
Contact:	Richard Brown	Date Tested:	06/10/2016
Site Name:	Rail Central	Sampled By:	Not Given
Site Address:	Not Given		

Test results

Laboratory Reference	Sample Reference	Location	Depth Top [m]	Depth Base [m]	Sample Type	Description	Moisture Content [%]
635668	UT	BHL008	5.5	Not Given	U	Brown CLAY	23
635669	UT	BHA004	4.2	Not Given	U	Brownish grey slightly gravelly CLAY	26
635670	UT	BHG004	1.5	Not Given	U	Brownish grey to yellowish brown CLAY	26
635671	UT	BHG004	5.5	Not Given	U	Brownish grey CLAY	19
635672	U (p)	BHG008	2	Not Given	U	Brownish grey slightly gravelly CLAY	28
635673	U (p)	BHG008	4	Not Given	U	Brownish grey slightly gravelly CLAY	24
635674	UT	BHRT002	5.5	Not Given	U	Greyish brown CLAY	20
635675	U (p)	BHG014	1.2	Not Given	U	Yellowish brown CLAY with thin laminae of grey clay	27
635676	UT	BHG024	3	Not Given	U	Yellowish brown slightly gravelly CLAY with thin laminae of grey clay	24
635677	UT	BHG024	5	Not Given	U	Brownish grey CLAY with thin laminae of yellowish brown clay	23

Remarks

Approved:

Mirosława Pytlik
PL Head of
Geotechnical Section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 11/10/2016

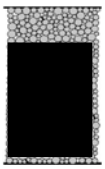
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Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details				
 *sketch showing specimen location in original sample*	Depth			1.00
	Description			Yellowish brown slightly sandy CLAY with thin laminae of grey clay
	Type			U
	Initial Sample Length	L_0	(mm)	195.6
	Initial Sample Diameter	D_0	(mm)	97.3
	Initial Sample Weight	W_0	(gr)	3056.9
	Bulk Density	ρ_0	(Mg/m3)	2.10
	Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

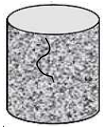
Initial Cell Pressure	σ_3	(kPa)	20
Strain Rate	m_S	(mm/min)	3.91180
MembraneThickness	m_b	(mm)	0.28
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	26
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.68
Initial Voids Ratio	e_0	.	0.58
Initial Degree of Saturation	S_o	(%)	100

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	210
MembraneCorrection	m_C	(kPa)	0.871
Strain At Max Stress	$\varepsilon_f\%$	(%)	13.24
Shear Strength	c_U	(kPa)	105
Final Moisture	$\omega_f\%$	(%)	26
Final Dry Density	ρ_{df}	(Mg/m3)	1.68
Final Voids Ratio	e_f	.	0.58
Final Degree of Saturation	S_f	(%)	100.0



Notes



Failure Sketch

(surface inclination)

Test Method	BS1377-7 : 1900 Clause 8			Test Name	635648
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	10/10/2016
Site Reference	Rail Central			Borehole	BHL003
Jobfile	16-28788			Sample	635648
Client	Hydrock Consultants			Depth	1.00
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS
i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth	5.00		
Description	Greyish brown CLAY		
Type	U		
Initial Sample Length	L_0	(mm)	195.5
Initial Sample Diameter	D_0	(mm)	98.3
Initial Sample Weight	W_0	(gr)	3047.6
Bulk Density	ρ_0	(Mg/m3)	2.05
Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

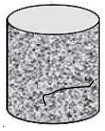
Initial Cell Pressure	σ_3	(kPa)	100
Strain Rate	m_S	(mm/min)	3.91060
MembraneThickness	m_b	(mm)	0.25
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	22
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.69
Initial Voids Ratio	e_0	.	0.57
Initial Degree of Saturation	S_o	(%)	100

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	194
MembraneCorrection	m_C	(kPa)	0.421
Strain At Max Stress	$\varepsilon_f\%$	(%)	5.92
Shear Strength	c_U	(kPa)	97
Final Moisture	$\omega_f\%$	(%)	22
Final Dry Density	ρ_{df}	(Mg/m3)	1.69
Final Voids Ratio	e_f	.	0.57
Final Degree of Saturation	S_f	(%)	100.0

Notes





Failure Sketch

(surface inclination)

Test Method	BS1377-7 : 1900 Clause 8			Test Name	635649
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	10/10/2016
Site Reference	Rail Central			Borehole	BHL003
Jobfile	16-28788			Sample	635649
Client	Hydrock Consultants			Depth	5.00
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS
i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details				
 *sketch showing specimen location in original sample*	Depth	2.00		
	Description	Yellowish brown to grey CLAY		
	Type	U		
	Initial Sample Length	L_0	(mm)	196.6
	Initial Sample Diameter	D_0	(mm)	98.3
	Initial Sample Weight	W_0	(gr)	2906.4
	Bulk Density	ρ_0	(Mg/m3)	1.95
	Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

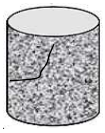
Initial Cell Pressure	σ_3	(kPa)	40
Strain Rate	m_S	(mm/min)	3.93240
MembraneThickness	m_b	(mm)	0.29
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	32
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.48
Initial Voids Ratio	e_0	.	0.79
Initial Degree of Saturation	S_o	(%)	100

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	102
MembraneCorrection	m_C	(kPa)	0.766
Strain At Max Stress	$\varepsilon_f\%$	(%)	10.11
Shear Strength	c_U	(kPa)	51
Final Moisture	$\omega_f\%$	(%)	32
Final Dry Density	ρ_{df}	(Mg/m3)	1.48
Final Voids Ratio	e_f	.	0.79
Final Degree of Saturation	S_f	(%)	100.0

Notes





Failure Sketch

(surface inclination)

Test Method	BS1377-7 : 1900 Clause 8			Test Name	635650
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	10/10/2016
Site Reference	Rail Central			Borehole	BHA002
Jobfile	16-28788			Sample	635650
Client	Hydrock Consultants			Depth	2.00
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS
i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth			4.00
Description			Yellowish brown to orangish brown slightly sandy CLAY
Type			U
Initial Sample Length	L_0	(mm)	191.6
Initial Sample Diameter	D_0	(mm)	98.8
Initial Sample Weight	W_0	(gr)	2893.9
Bulk Density	ρ_0	(Mg/m3)	1.97
Particle Density	ρ_s	(Mg/m3)	2.65

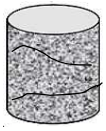
Initial Conditions

Initial Cell Pressure	σ_3	(kPa)	80
Strain Rate	m_S	(mm/min)	3.83140
MembraneThickness	m_b	(mm)	0.31
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	23
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.60
Initial Voids Ratio	e_0	.	0.66
Initial Degree of Saturation	S_o	(%)	93

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	46
MembraneCorrection	m_C	(kPa)	1.141
Strain At Max Stress	$\varepsilon_f\%$	(%)	18.42
Shear Strength	c_U	(kPa)	23
Final Moisture	$\omega_f\%$	(%)	23
Final Dry Density	ρ_{df}	(Mg/m3)	1.60
Final Voids Ratio	e_f	.	0.66
Final Degree of Saturation	S_f	(%)	93.2





Failure Sketch

(surface inclination)

Notes

Test Method	BS1377-7 : 1900 Clause 8			Test Name	635651
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	10/10/2016
Site Reference	Rail Central			Borehole	BHA002
Jobfile	16-28788			Sample	635651
Client	Hydrock Consultants			Depth	4.00
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

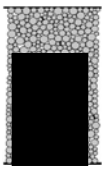
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i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth			1.20
Description			Light brown CLAY with thin laminae of grey clay
Type			U
Initial Sample Length	L_0	(mm)	194.9
Initial Sample Diameter	D_0	(mm)	99.9
Initial Sample Weight	W_0	(gr)	3018.5
Bulk Density	ρ_0	(Mg/m3)	1.98
Particle Density	ρ_s	(Mg/m3)	2.65

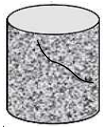
Initial Conditions

Initial Cell Pressure	σ_3	(kPa)	24
Strain Rate	m_S	(mm/min)	3.89780
MembraneThickness	m_b	(mm)	0.23
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	28
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.54
Initial Voids Ratio	e_0	.	0.72
Initial Degree of Saturation	S_o	(%)	100

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	170
MembraneCorrection	m_C	(kPa)	0.559
Strain At Max Stress	$\varepsilon_f\%$	(%)	8.74
Shear Strength	c_U	(kPa)	85
Final Moisture	$\omega_f\%$	(%)	28
Final Dry Density	ρ_{df}	(Mg/m3)	1.54
Final Voids Ratio	e_f	.	0.72
Final Degree of Saturation	S_f	(%)	100.0





Failure Sketch

(surface inclination)

Notes

Test Method	BS1377-7 : 1900 Clause 8			Test Name	635652
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	10/10/2016
Site Reference	Rail Central			Borehole	BHL005
Jobfile	16-28788			Sample	635652
Client	Hydrock Consultants			Depth	1.20
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS

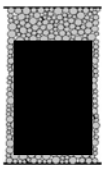
i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth			2.00
Description			Yellowish brown to brownish grey CLAY
Type			U
Initial Sample Length	L_0	(mm)	197.2
Initial Sample Diameter	D_0	(mm)	99.3
Initial Sample Weight	W_0	(gr)	3007.8
Bulk Density	ρ_0	(Mg/m3)	1.97
Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

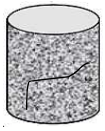
Initial Cell Pressure	σ_3	(kPa)	40
Strain Rate	m_S	(mm/min)	3.94440
MembraneThickness	m_b	(mm)	0.32
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	28
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.54
Initial Voids Ratio	e_0	.	0.72
Initial Degree of Saturation	S_o	(%)	100

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	124
MembraneCorrection	m_C	(kPa)	0.730
Strain At Max Stress	$\varepsilon_f\%$	(%)	9.43
Shear Strength	c_U	(kPa)	62
Final Moisture	$\omega_f\%$	(%)	28
Final Dry Density	ρ_{df}	(Mg/m3)	1.54
Final Voids Ratio	e_f	.	0.72
Final Degree of Saturation	S_f	(%)	100.0

Notes





Failure Sketch

(surface inclination)

Test Method	BS1377-7 : 1900 Clause 8			Test Name	635653
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	10/10/2016
Site Reference	Rail Central			Borehole	BHA006
Jobfile	16-28788			Sample	635653
Client	Hydrock Consultants			Depth	2.00
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS

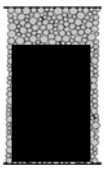
i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth			4.00
Description			Brownish grey CLAY with pockets of yellowish brown sand
Type			U
Initial Sample Length	L_0	(mm)	199.9
Initial Sample Diameter	D_0	(mm)	98.5
Initial Sample Weight	W_0	(gr)	3049.1
Bulk Density	ρ_0	(Mg/m3)	2.00
Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

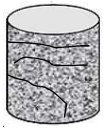
Initial Cell Pressure	σ_3	(kPa)	80
Strain Rate	m_S	(mm/min)	3.99760
MembraneThickness	m_b	(mm)	0.25
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	30
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.54
Initial Voids Ratio	e_0	.	0.72
Initial Degree of Saturation	S_o	(%)	100

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	192
MembraneCorrection	m_C	(kPa)	0.431
Strain At Max Stress	$\varepsilon_f\%$	(%)	6.14
Shear Strength	c_U	(kPa)	96
Final Moisture	$\omega_f\%$	(%)	23
Final Dry Density	ρ_{df}	(Mg/m3)	1.62
Final Voids Ratio	e_f	.	0.63
Final Degree of Saturation	S_f	(%)	97.7

Notes





Failure Sketch

(surface inclination)

Test Method	BS1377-7 : 1900 Clause 8			Test Name	635654
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	11/10/2016
Site Reference	Rail Central			Borehole	BHA006
Jobfile	16-28788			Sample	635654
Client	Hydrock Consultants			Depth	4.00
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS

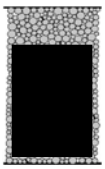
i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth	2.20		
Description	Yellowish brown slightly sandy CLAY		
Type	U		
Initial Sample Length	L_0	(mm)	196.5
Initial Sample Diameter	D_0	(mm)	98.5
Initial Sample Weight	W_0	(gr)	2979.1
Bulk Density	ρ_0	(Mg/m3)	1.99
Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

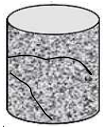
Initial Cell Pressure	σ_3	(kPa)	45
Strain Rate	m_S	(mm/min)	3.92940
MembraneThickness	m_b	(mm)	0.31
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	21
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.65
Initial Voids Ratio	e_0	.	0.61
Initial Degree of Saturation	S_o	(%)	90

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	236
MembraneCorrection	m_C	(kPa)	0.792
Strain At Max Stress	$\varepsilon_f\%$	(%)	9.38
Shear Strength	c_U	(kPa)	118
Final Moisture	$\omega_f\%$	(%)	21
Final Dry Density	ρ_{df}	(Mg/m3)	1.65
Final Voids Ratio	e_f	.	0.61
Final Degree of Saturation	S_f	(%)	90.2

Notes





Failure Sketch

(surface inclination)

Test Method	BS1377-7 : 1900 Clause 8			Test Name	635655
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	11/10/2016
Site Reference	Rail Central			Borehole	BHG011
Jobfile	16-28788			Sample	635655
Client	Hydrock Consultants			Depth	2.20
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS

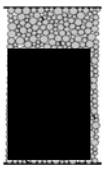
i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth	1.20		
Description	Yellowish brown CLAY		
Type	U		
Initial Sample Length	L_0	(mm)	196.1
Initial Sample Diameter	D_0	(mm)	99.8
Initial Sample Weight	W_0	(gr)	2817.1
Bulk Density	ρ_0	(Mg/m3)	1.84
Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

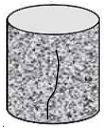
Initial Cell Pressure	σ_3	(kPa)	24
Strain Rate	m_S	(mm/min)	3.92220
MembraneThickness	m_b	(mm)	0.28
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	38
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.33
Initial Voids Ratio	e_0	.	0.99
Initial Degree of Saturation	S_o	(%)	100

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	64
MembraneCorrection	m_C	(kPa)	0.744
Strain At Max Stress	$\varepsilon_f\%$	(%)	12.32
Shear Strength	c_U	(kPa)	32
Final Moisture	$\omega_f\%$	(%)	38
Final Dry Density	ρ_{df}	(Mg/m3)	1.33
Final Voids Ratio	e_f	.	0.99
Final Degree of Saturation	S_f	(%)	100.0

Notes





Failure Sketch

(surface inclination)

Test Method	BS1377-7 : 1900 Clause 8			Test Name	635656
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	11/10/2016
Site Reference	Rail Central			Borehole	BHA005
Jobfile	16-28788			Sample	635656
Client	Hydrock Consultants			Depth	1.20
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

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i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth			4.00
Description			Greyish brown CLAY
Type			U
Initial Sample Length	L_0	(mm)	198.4
Initial Sample Diameter	D_0	(mm)	99.6
Initial Sample Weight	W_0	(gr)	3102.9
Bulk Density	ρ_0	(Mg/m3)	2.01
Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

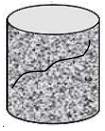
Initial Cell Pressure	σ_3	(kPa)	80
Strain Rate	m_S	(mm/min)	3.96840
MembraneThickness	m_b	(mm)	0.28
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	24
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.62
Initial Voids Ratio	e_0	.	0.64
Initial Degree of Saturation	S_o	(%)	100

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	165
MembraneCorrection	m_C	(kPa)	0.548
Strain At Max Stress	$\varepsilon_f\%$	(%)	7.07
Shear Strength	c_U	(kPa)	83
Final Moisture	$\omega_f\%$	(%)	24
Final Dry Density	ρ_{df}	(Mg/m3)	1.62
Final Voids Ratio	e_f	.	0.64
Final Degree of Saturation	S_f	(%)	99.7

Notes





Failure Sketch

(surface inclination)

Test Method	BS1377-7 : 1900 Clause 8			Test Name	635657
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	11/10/2016
Site Reference	Rail Central			Borehole	BHA013
Jobfile	16-28788			Sample	635657
Client	Hydrock Consultants			Depth	4.00
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS

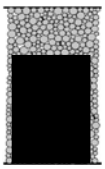
i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth	2.00		
Description	Brownish grey CLAY with pockets of yellowish brown sand		
Type	U		
Initial Sample Length	L_0	(mm)	198.0
Initial Sample Diameter	D_0	(mm)	99.2
Initial Sample Weight	W_0	(gr)	3022.1
Bulk Density	ρ_0	(Mg/m3)	1.97
Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

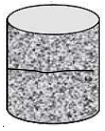
Initial Cell Pressure	σ_3	(kPa)	40
Strain Rate	m_S	(mm/min)	3.96000
MembraneThickness	m_b	(mm)	0.21
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	27
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.56
Initial Voids Ratio	e_0	.	0.70
Initial Degree of Saturation	S_o	(%)	100

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	153
MembraneCorrection	m_C	(kPa)	0.417
Strain At Max Stress	$\varepsilon_f\%$	(%)	7.77
Shear Strength	c_U	(kPa)	77
Final Moisture	$\omega_f\%$	(%)	27
Final Dry Density	ρ_{df}	(Mg/m3)	1.56
Final Voids Ratio	e_f	.	0.70
Final Degree of Saturation	S_f	(%)	100.0



Notes



Failure Sketch

(surface inclination)

Test Method	BS1377-7 : 1900 Clause 8			Test Name	635658
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	11/10/2016
Site Reference	Rail Central			Borehole	BHG007
Jobfile	16-28788			Sample	635658
Client	Hydrock Consultants			Depth	2.00
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS

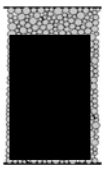
i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth			4.00
Description			Brownish grey CLAY with pockets of yellowish brown sand
Type			U
Initial Sample Length	L_0	(mm)	199.9
Initial Sample Diameter	D_0	(mm)	99.5
Initial Sample Weight	W_0	(gr)	3034.2
Bulk Density	ρ_0	(Mg/m3)	1.95
Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

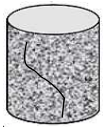
Initial Cell Pressure	σ_3	(kPa)	80
Strain Rate	m_S	(mm/min)	3.99840
MembraneThickness	m_b	(mm)	0.33
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	22
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.60
Initial Voids Ratio	e_0	.	0.66
Initial Degree of Saturation	S_o	(%)	89

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	255
MembraneCorrection	m_C	(kPa)	0.784
Strain At Max Stress	$\varepsilon_f\%$	(%)	9.64
Shear Strength	c_U	(kPa)	128
Final Moisture	$\omega_f\%$	(%)	22
Final Dry Density	ρ_{df}	(Mg/m3)	1.60
Final Voids Ratio	e_f	.	0.66
Final Degree of Saturation	S_f	(%)	88.7

Notes





Failure Sketch

(surface inclination)

Test Method	BS1377-7 : 1900 Clause 8			Test Name	635659
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	11/10/2016
Site Reference	Rail Central			Borehole	BHG007
Jobfile	16-28788			Sample	635659
Client	Hydrock Consultants			Depth	4.00
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS

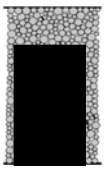
i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth	2.00		
Description	Greyish brown CLAY with thin laminae of yellowish brown sand		
Type	U		
Initial Sample Length	L_0	(mm)	196.3
Initial Sample Diameter	D_0	(mm)	99.1
Initial Sample Weight	W_0	(gr)	3012.7
Bulk Density	ρ_0	(Mg/m3)	1.99
Particle Density	ρ_s	(Mg/m3)	2.65

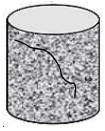
Initial Conditions

Initial Cell Pressure	σ_3	(kPa)	40
Strain Rate	m_S	(mm/min)	3.92520
MembraneThickness	m_b	(mm)	0.24
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	26
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.58
Initial Voids Ratio	e_0	.	0.68
Initial Degree of Saturation	S_o	(%)	100

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	182
MembraneCorrection	m_C	(kPa)	0.533
Strain At Max Stress	$\varepsilon_f\%$	(%)	8.55
Shear Strength	c_U	(kPa)	91
Final Moisture	$\omega_f\%$	(%)	26
Final Dry Density	ρ_{df}	(Mg/m3)	1.58
Final Voids Ratio	e_f	.	0.68
Final Degree of Saturation	S_f	(%)	100.0





Failure Sketch

(surface inclination)

Notes

Test Method	BS1377-7 : 1900 Clause 8			Test Name	635660
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	11/10/2016
Site Reference	Rail Central			Borehole	BHG010
Jobfile	16-28788			Sample	635660
Client	Hydrock Consultants			Depth	2.00
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS

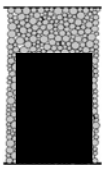
i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth	2.00		
Description	Dark yellow slightly sandy CLAY		
Type	U		
Initial Sample Length	L_0	(mm)	196.7
Initial Sample Diameter	D_0	(mm)	99.6
Initial Sample Weight	W_0	(gr)	2976.6
Bulk Density	ρ_0	(Mg/m3)	1.94
Particle Density	ρ_s	(Mg/m3)	2.65

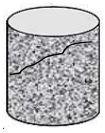
Initial Conditions

Initial Cell Pressure	σ_3	(kPa)	40
Strain Rate	m_S	(mm/min)	3.93300
MembraneThickness	m_b	(mm)	0.24
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	29
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.50
Initial Voids Ratio	e_0	.	0.76
Initial Degree of Saturation	S_o	(%)	100

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	190
MembraneCorrection	m_C	(kPa)	0.627
Strain At Max Stress	$\varepsilon_f\%$	(%)	9.28
Shear Strength	c_U	(kPa)	95
Final Moisture	$\omega_f\%$	(%)	29
Final Dry Density	ρ_{df}	(Mg/m3)	1.50
Final Voids Ratio	e_f	.	0.76
Final Degree of Saturation	S_f	(%)	100.0





Failure Sketch

(surface inclination)

Notes

Test Method	BS1377-7 : 1900 Clause 8			Test Name	635661
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	11/10/2016
Site Reference	Rail Central			Borehole	BHG023
Jobfile	16-28788			Sample	635661
Client	Hydrock Consultants			Depth	2.00
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

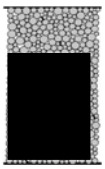
i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS
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Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth			2.20
Description			Greyish brown to yellowish brown CLAY
Type			U
Initial Sample Length	L_0	(mm)	195.2
Initial Sample Diameter	D_0	(mm)	98.8
Initial Sample Weight	W_0	(gr)	2982.7
Bulk Density	ρ_0	(Mg/m3)	1.99
Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

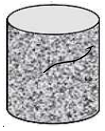
Initial Cell Pressure	σ_3	(kPa)	45
Strain Rate	m_S	(mm/min)	3.90440
MembraneThickness	m_b	(mm)	0.32
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	25
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.60
Initial Voids Ratio	e_0	.	0.66
Initial Degree of Saturation	S_o	(%)	99

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	276
MembraneCorrection	m_C	(kPa)	0.681
Strain At Max Stress	$\varepsilon_f\%$	(%)	7.80
Shear Strength	c_U	(kPa)	138
Final Moisture	$\omega_f\%$	(%)	25
Final Dry Density	ρ_{df}	(Mg/m3)	1.60
Final Voids Ratio	e_f	.	0.66
Final Degree of Saturation	S_f	(%)	99.3

Notes





Failure Sketch

(surface inclination)

Test Method	BS1377-7 : 1900 Clause 8			Test Name	635662
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	11/10/2016
Site Reference	Rail Central			Borehole	BHRT001
Jobfile	16-28788			Sample	635662
Client	Hydrock Consultants			Depth	2.20
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS

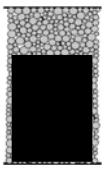
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Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth	4.30		
Description	Greyish brown CLAY		
Type	U		
Initial Sample Length	L_0	(mm)	198.1
Initial Sample Diameter	D_0	(mm)	97.7
Initial Sample Weight	W_0	(gr)	3095.1
Bulk Density	ρ_0	(Mg/m3)	2.08
Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

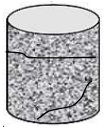
Initial Cell Pressure	σ_3	(kPa)	90
Strain Rate	m_S	(mm/min)	3.96280
MembraneThickness	m_b	(mm)	0.29
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	21
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.73
Initial Voids Ratio	e_0	.	0.53
Initial Degree of Saturation	S_o	(%)	100

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	335
MembraneCorrection	m_C	(kPa)	0.524
Strain At Max Stress	$\varepsilon_f\%$	(%)	6.11
Shear Strength	c_U	(kPa)	167
Final Moisture	$\omega_f\%$	(%)	21
Final Dry Density	ρ_{df}	(Mg/m3)	1.73
Final Voids Ratio	e_f	.	0.53
Final Degree of Saturation	S_f	(%)	100.0

Notes





Failure Sketch

(surface inclination)

Test Method	BS1377-7 : 1900 Clause 8			Test Name	635663
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	11/10/2016
Site Reference	Rail Central			Borehole	BHRT001
Jobfile	16-28788			Sample	635663
Client	Hydrock Consultants			Depth	4.30
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

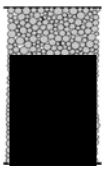
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Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details				
 *sketch showing specimen location in original sample*	Depth			2.00
	Description			Orange slightly gravelly clayey SAND
	Type			U
	Initial Sample Length	L_0	(mm)	195.7
	Initial Sample Diameter	D_0	(mm)	98.7
	Initial Sample Weight	W_0	(gr)	3274.6
	Bulk Density	ρ_0	(Mg/m3)	2.19
	Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

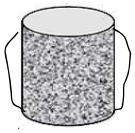
Initial Cell Pressure	σ_3	(kPa)	40
Strain Rate	m_S	(mm/min)	3.91380
MembraneThickness	m_b	(mm)	0.27
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	18
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.85
Initial Voids Ratio	e_0	.	0.43
Initial Degree of Saturation	S_o	(%)	100

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	52
MembraneCorrection	m_C	(kPa)	0.766
Strain At Max Stress	$\varepsilon_f\%$	(%)	10.18
Shear Strength	c_U	(kPa)	26
Final Moisture	$\omega_f\%$	(%)	18
Final Dry Density	ρ_{df}	(Mg/m3)	1.85
Final Voids Ratio	e_f	.	0.43
Final Degree of Saturation	S_f	(%)	100.0

Notes

Unable to take a photo



Failure Sketch

(surface inclination)

Test Method	BS1377-7 : 1900 Clause 8			Test Name	635664
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	11/10/2016
Site Reference	Rail Central			Borehole	BHA014
Jobfile	16-28788			Sample	635664
Client	Hydrock Consultants			Depth	2.00
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

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Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details				
 *sketch showing specimen location in original sample*	Depth	2.00		
	Description	Yellowish brown CLAY		
	Type	U		
	Initial Sample Length	L_0	(mm)	196.8
	Initial Sample Diameter	D_0	(mm)	99.6
	Initial Sample Weight	W_0	(gr)	2944.2
	Bulk Density	ρ_0	(Mg/m3)	1.92
	Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

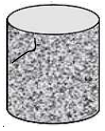
Initial Cell Pressure	σ_3	(kPa)	40
Strain Rate	m_S	(mm/min)	3.93680
MembraneThickness	m_b	(mm)	0.30
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	25
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.54
Initial Voids Ratio	e_0	.	0.72
Initial Degree of Saturation	S_o	(%)	91

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	178
MembraneCorrection	m_C	(kPa)	0.750
Strain At Max Stress	$\varepsilon_f\%$	(%)	10.96
Shear Strength	c_U	(kPa)	89
Final Moisture	$\omega_f\%$	(%)	25
Final Dry Density	ρ_{df}	(Mg/m3)	1.54
Final Voids Ratio	e_f	.	0.72
Final Degree of Saturation	S_f	(%)	91.0



Notes



Failure Sketch

(surface inclination)

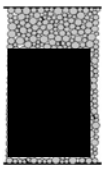
Test Method	BS1377-7 : 1900 Clause 8			Test Name	635665
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	11/10/2016
Site Reference	Rail Central			Borehole	BHG019
Jobfile	16-28788			Sample	635665
Client	Hydrock Consultants			Depth	2.00
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

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Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details				
 *sketch showing specimen location in original sample*	Depth	3.50		
	Description	Brownish grey silty CLAY		
	Type	U		
	Initial Sample Length	L_0	(mm)	195.1
	Initial Sample Diameter	D_0	(mm)	98.9
	Initial Sample Weight	W_0	(gr)	2898.8
	Bulk Density	ρ_0	(Mg/m3)	1.93
	Particle Density	ρ_s	(Mg/m3)	2.65

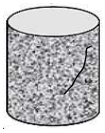
Initial Conditions

Initial Cell Pressure	σ_3	(kPa)	70
Strain Rate	m_S	(mm/min)	3.90280
MembraneThickness	m_b	(mm)	0.26
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	17
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.65
Initial Voids Ratio	e_0	.	0.61
Initial Degree of Saturation	S_o	(%)	76

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	170
MembraneCorrection	m_C	(kPa)	0.993
Strain At Max Stress	$\varepsilon_f\%$	(%)	18.52
Shear Strength	c_U	(kPa)	85
Final Moisture	$\omega_f\%$	(%)	17
Final Dry Density	ρ_{df}	(Mg/m3)	1.65
Final Voids Ratio	e_f	.	0.61
Final Degree of Saturation	S_f	(%)	75.6





Failure Sketch

(surface inclination)

Notes

Test Method	BS1377-7 : 1900 Clause 8			Test Name	635666
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	11/10/2016
Site Reference	Rail Central			Borehole	BHG012
Jobfile	16-28788			Sample	635666
Client	Hydrock Consultants			Depth	3.50
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

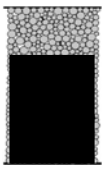
i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS
i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth	5.50		
Description	Brownish grey silty CLAY		
Type	U		
Initial Sample Length	L_0	(mm)	196.6
Initial Sample Diameter	D_0	(mm)	97.5
Initial Sample Weight	W_0	(gr)	3180.0
Bulk Density	ρ_0	(Mg/m3)	2.17
Particle Density	ρ_s	(Mg/m3)	2.65

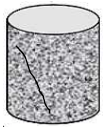
Initial Conditions

Initial Cell Pressure	σ_3	(kPa)	110
Strain Rate	m_S	(mm/min)	3.93140
MembraneThickness	m_b	(mm)	0.32
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	18
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.83
Initial Voids Ratio	e_0	.	0.45
Initial Degree of Saturation	S_o	(%)	100

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	331
MembraneCorrection	m_C	(kPa)	1.196
Strain At Max Stress	$\varepsilon_f\%$	(%)	16.44
Shear Strength	c_U	(kPa)	166
Final Moisture	$\omega_f\%$	(%)	18
Final Dry Density	ρ_{df}	(Mg/m3)	1.83
Final Voids Ratio	e_f	.	0.45
Final Degree of Saturation	S_f	(%)	100.0





Failure Sketch

(surface inclination)

Notes

Test Method	BS1377-7 : 1900 Clause 8			Test Name	635667
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	11/10/2016
Site Reference	Rail Central			Borehole	BHG012
Jobfile	16-28788			Sample	635667
Client	Hydrock Consultants			Depth	5.50
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

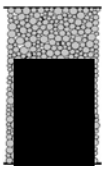
i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS
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Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth	5.50		
Description	Brown CLAY		
Type	U		
Initial Sample Length	L_0	(mm)	196.1
Initial Sample Diameter	D_0	(mm)	98.9
Initial Sample Weight	W_0	(gr)	3037.4
Bulk Density	ρ_0	(Mg/m3)	2.02
Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

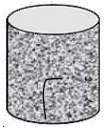
Initial Cell Pressure	σ_3	(kPa)	110
Strain Rate	m_S	(mm/min)	3.92240
MembraneThickness	m_b	(mm)	0.29
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	23
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.63
Initial Voids Ratio	e_0	.	0.62
Initial Degree of Saturation	S_o	(%)	100

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	234
MembraneCorrection	m_C	(kPa)	0.468
Strain At Max Stress	$\varepsilon_f\%$	(%)	5.84
Shear Strength	c_U	(kPa)	117
Final Moisture	$\omega_f\%$	(%)	23
Final Dry Density	ρ_{df}	(Mg/m3)	1.63
Final Voids Ratio	e_f	.	0.62
Final Degree of Saturation	S_f	(%)	99.7

Notes





Failure Sketch

(surface inclination)

Test Method	BS1377-7 : 1900 Clause 8			Test Name	635668
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	11/10/2016
Site Reference	Rail Central			Borehole	BHL008
Jobfile	16-28788			Sample	635668
Client	Hydrock Consultants			Depth	5.50
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

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i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth			4.20
Description			Brownish grey slightly gravelly CLAY
Type			U
Initial Sample Length	L_0	(mm)	205.2
Initial Sample Diameter	D_0	(mm)	96.5
Initial Sample Weight	W_0	(gr)	2912.3
Bulk Density	ρ_0	(Mg/m3)	1.94
Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

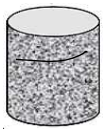
Initial Cell Pressure	σ_3	(kPa)	85
Strain Rate	m_S	(mm/min)	4.00000
MembraneThickness	m_b	(mm)	0.31
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	26
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.54
Initial Voids Ratio	e_0	.	0.72
Initial Degree of Saturation	S_o	(%)	96

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	49
MembraneCorrection	m_C	(kPa)	0.633
Strain At Max Stress	$\varepsilon_f\%$	(%)	7.60
Shear Strength	c_U	(kPa)	25
Final Moisture	$\omega_f\%$	(%)	26
Final Dry Density	ρ_{df}	(Mg/m3)	1.54
Final Voids Ratio	e_f	.	0.72
Final Degree of Saturation	S_f	(%)	96.0



Notes



Failure Sketch

(surface inclination)

Test Method	BS1377-7 : 1900 Clause 8	Test Name	635669
Database: .\SQLEXPRESS \ 6171-I2 Analytical		Test Date	11/10/2016
Site Reference	Rail Central	Borehole	BHA004
Jobfile	16-28788	Sample	635669
Client	Hydrock Consultants	Depth	4.20
Operator	palmowskia	Checked	pytlikm
Approved	pytlikm		

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i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details				
 *sketch showing specimen location in original sample*	Depth	1.50		
	Description	Brownish grey to yellowish brown CLAY		
	Type	U		
	Initial Sample Length	L_0	(mm)	197.2
	Initial Sample Diameter	D_0	(mm)	98.7
	Initial Sample Weight	W_0	(gr)	3025.6
	Bulk Density	ρ_0	(Mg/m3)	2.00
	Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

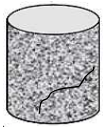
Initial Cell Pressure	σ_3	(kPa)	30
Strain Rate	m_S	(mm/min)	3.94400
MembraneThickness	m_b	(mm)	0.26
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	26
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.59
Initial Voids Ratio	e_0	.	0.67
Initial Degree of Saturation	S_o	(%)	100

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	187
MembraneCorrection	m_C	(kPa)	0.603
Strain At Max Stress	$\varepsilon_f\%$	(%)	7.31
Shear Strength	c_U	(kPa)	93
Final Moisture	$\omega_f\%$	(%)	26
Final Dry Density	ρ_{df}	(Mg/m3)	1.59
Final Voids Ratio	e_f	.	0.67
Final Degree of Saturation	S_f	(%)	100.0

Notes





Failure Sketch

(surface inclination)

Test Method	BS1377-7 : 1900 Clause 8			Test Name	635670
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	11/10/2016
Site Reference	Rail Central			Borehole	BHG004
Jobfile	16-28788			Sample	635670
Client	Hydrock Consultants			Depth	1.50
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS
i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth	5.50		
Description	Brownish grey CLAY		
Type	U		
Initial Sample Length	L_0	(mm)	192.8
Initial Sample Diameter	D_0	(mm)	99.2
Initial Sample Weight	W_0	(gr)	2998.3
Bulk Density	ρ_0	(Mg/m3)	2.01
Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

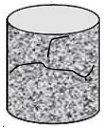
Initial Cell Pressure	σ_3	(kPa)	110
Strain Rate	m_S	(mm/min)	3.85600
MembraneThickness	m_b	(mm)	0.30
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	20
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.68
Initial Voids Ratio	e_0	.	0.58
Initial Degree of Saturation	S_o	(%)	91

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	277
MembraneCorrection	m_C	(kPa)	0.753
Strain At Max Stress	$\varepsilon_f\%$	(%)	10.08
Shear Strength	c_U	(kPa)	138
Final Moisture	$\omega_f\%$	(%)	20
Final Dry Density	ρ_{df}	(Mg/m3)	1.68
Final Voids Ratio	e_f	.	0.58
Final Degree of Saturation	S_f	(%)	91.0

Notes





Failure Sketch

(surface inclination)

Test Method	BS1377-7 : 1900 Clause 8			Test Name	635671
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	11/10/2016
Site Reference	Rail Central			Borehole	BHG004
Jobfile	16-28788			Sample	635671
Client	Hydrock Consultants			Depth	5.50
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

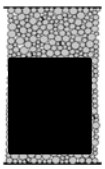
i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS

i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details				
 *sketch showing specimen location in original sample*	Depth	2.00		
	Description	Brownish grey slightly gravelly CLAY		
	Type	U		
	Initial Sample Length	L_0	(mm)	202.5
	Initial Sample Diameter	D_0	(mm)	98.4
	Initial Sample Weight	W_0	(gr)	2983.4
	Bulk Density	ρ_0	(Mg/m3)	1.94
	Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

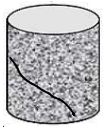
Initial Cell Pressure	σ_3	(kPa)	40
Strain Rate	m_S	(mm/min)	4.00000
MembraneThickness	m_b	(mm)	0.29
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	28
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.52
Initial Voids Ratio	e_0	.	0.75
Initial Degree of Saturation	S_o	(%)	98

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	154
MembraneCorrection	m_C	(kPa)	0.714
Strain At Max Stress	$\varepsilon_f\%$	(%)	9.47
Shear Strength	c_U	(kPa)	77
Final Moisture	$\omega_f\%$	(%)	28
Final Dry Density	ρ_{df}	(Mg/m3)	1.52
Final Voids Ratio	e_f	.	0.75
Final Degree of Saturation	S_f	(%)	98.3



Notes



Failure Sketch

(surface inclination)

Test Method	BS1377-7 : 1900 Clause 8			Test Name	635672
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	11/10/2016
Site Reference	Rail Central			Borehole	BHG008
Jobfile	16-28788			Sample	635672
Client	Hydrock Consultants			Depth	2.00
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

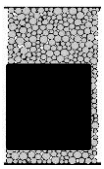
i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS
i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth	4.00		
Description	Brownish grey slightly gravelly CLAY		
Type	U		
Initial Sample Length	L_0	(mm)	198.4
Initial Sample Diameter	D_0	(mm)	98.9
Initial Sample Weight	W_0	(gr)	3089.8
Bulk Density	ρ_0	(Mg/m3)	2.03
Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

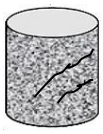
Initial Cell Pressure	σ_3	(kPa)	80
Strain Rate	m_s	(mm/min)	3.96820
MembraneThickness	m_b	(mm)	0.00
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	24
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.64
Initial Voids Ratio	e_0	.	0.62
Initial Degree of Saturation	S_o	(%)	100

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	233
MembraneCorrection	m_c	(kPa)	0.000
Strain At Max Stress	$\varepsilon_f\%$	(%)	7.65
Shear Strength	c_u	(kPa)	116
Final Moisture	$\omega_f\%$	(%)	24
Final Dry Density	ρ_{df}	(Mg/m3)	1.64
Final Voids Ratio	e_f	.	0.62
Final Degree of Saturation	S_f	(%)	100.0

Notes





Failure Sketch

(surface inclination)

Test Method	BS1377-7 : 1900 Clause 8			Test Name	635673
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	11/10/2016
Site Reference	Rail Central			Borehole	BHG008
Jobfile	16-28788			Sample	635673
Client	Hydrock Consultants			Depth	4.00
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

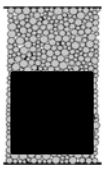
i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS
i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth	5.50		
Description	Greyish brown CLAY		
Type	U		
Initial Sample Length	L_0	(mm)	200.5
Initial Sample Diameter	D_0	(mm)	98.9
Initial Sample Weight	W_0	(gr)	3198.3
Bulk Density	ρ_0	(Mg/m3)	2.08
Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

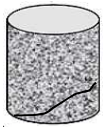
Initial Cell Pressure	σ_3	(kPa)	110
Strain Rate	m_S	(mm/min)	4.00000
MembraneThickness	m_b	(mm)	0.32
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	20
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.73
Initial Voids Ratio	e_0	.	0.53
Initial Degree of Saturation	S_o	(%)	100

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	350
MembraneCorrection	m_C	(kPa)	0.551
Strain At Max Stress	$\varepsilon_f\%$	(%)	6.64
Shear Strength	c_U	(kPa)	175
Final Moisture	$\omega_f\%$	(%)	20
Final Dry Density	ρ_{df}	(Mg/m3)	1.73
Final Voids Ratio	e_f	.	0.53
Final Degree of Saturation	S_f	(%)	99.8



Notes



Failure Sketch

(surface inclination)

Test Method	BS1377-7 : 1900 Clause 8			Test Name	635674
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	11/10/2016
Site Reference	Rail Central			Borehole	BHRT002
Jobfile	16-28788			Sample	635674
Client	Hydrock Consultants			Depth	5.50
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

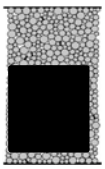
i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS
i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth			1.20
Description			Yellowish brown CLAY with thin laminae of grey clay
Type			U
Initial Sample Length	L_0	(mm)	196.7
Initial Sample Diameter	D_0	(mm)	99.0
Initial Sample Weight	W_0	(gr)	3017.9
Bulk Density	ρ_0	(Mg/m3)	1.99
Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

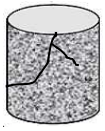
Initial Cell Pressure	σ_3	(kPa)	24
Strain Rate	m_S	(mm/min)	3.93340
MembraneThickness	m_b	(mm)	28.00
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	27
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.56
Initial Voids Ratio	e_0	.	0.69
Initial Degree of Saturation	S_o	(%)	100

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	267
MembraneCorrection	m_C	(kPa)	43.183
Strain At Max Stress	$\varepsilon_f\%$	(%)	5.21
Shear Strength	c_U	(kPa)	134
Final Moisture	$\omega_f\%$	(%)	27
Final Dry Density	ρ_{df}	(Mg/m3)	1.56
Final Voids Ratio	e_f	.	0.69
Final Degree of Saturation	S_f	(%)	100.0



Notes



Failure Sketch

(surface inclination)

Test Method	BS1377-7 : 1900 Clause 8			Test Name	635675
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	11/10/2016
Site Reference	Rail Central			Borehole	BHG014
Jobfile	16-28788			Sample	635675
Client	Hydrock Consultants			Depth	1.20
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

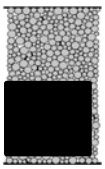
i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS
i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth			3.00
Description			Yellowish brown slightly gravelly CLAY with thin laminae of grey clay
Type			U
Initial Sample Length	L_0	(mm)	195.4
Initial Sample Diameter	D_0	(mm)	98.7
Initial Sample Weight	W_0	(gr)	2968.6
Bulk Density	ρ_0	(Mg/m3)	1.99
Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

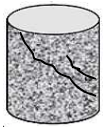
Initial Cell Pressure	σ_3	(kPa)	60
Strain Rate	m_S	(mm/min)	3.90720
MembraneThickness	m_b	(mm)	0.19
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	24
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.60
Initial Voids Ratio	e_0	.	0.66
Initial Degree of Saturation	S_o	(%)	98

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	235
MembraneCorrection	m_C	(kPa)	0.474
Strain At Max Stress	$\varepsilon_f\%$	(%)	10.16
Shear Strength	c_U	(kPa)	117
Final Moisture	$\omega_f\%$	(%)	24
Final Dry Density	ρ_{df}	(Mg/m3)	1.60
Final Voids Ratio	e_f	.	0.66
Final Degree of Saturation	S_f	(%)	97.7



Notes



Failure Sketch

(surface inclination)

Test Method	BS1377-7 : 1900 Clause 8			Test Name	635676
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	11/10/2016
Site Reference	Rail Central			Borehole	BHG024
Jobfile	16-28788			Sample	635676
Client	Hydrock Consultants			Depth	3.00
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

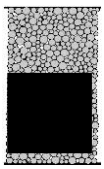
i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS
i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth	5.00		
Description	Brownish grey CLAY with thin laminae of yellowish brown clay		
Type	U		
Initial Sample Length	L_0	(mm)	196.7
Initial Sample Diameter	D_0	(mm)	99.8
Initial Sample Weight	W_0	(gr)	3085.0
Bulk Density	ρ_0	(Mg/m3)	2.01
Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

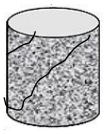
Initial Cell Pressure	σ_3	(kPa)	100
Strain Rate	m_s	(mm/min)	3.93320
MembraneThickness	m_b	(mm)	0.25
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 4
Initial Moisture	$\omega_i\%$	(%)	23
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.63
Initial Voids Ratio	e_0	.	0.62
Initial Degree of Saturation	S_o	(%)	97

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	305
MembraneCorrection	m_c	(kPa)	0.466
Strain At Max Stress	$\varepsilon_f\%$	(%)	5.87
Shear Strength	c_u	(kPa)	152
Final Moisture	$\omega_f\%$	(%)	23
Final Dry Density	ρ_{df}	(Mg/m3)	1.63
Final Voids Ratio	e_f	.	0.62
Final Degree of Saturation	S_f	(%)	97.2



Notes



Failure Sketch

(surface inclination)

Test Method	BS1377-7 : 1900 Clause 8			Test Name	635677
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	11/10/2016
Site Reference	Rail Central			Borehole	BHG024
Jobfile	16-28788			Sample	635677
Client	Hydrock Consultants			Depth	5.00
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS
i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

TEST CERTIFICATE

Determination of Moisture Content

Tested in Accordance with BS 1377-2:1990: Clause 3.2

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-29797
		Date Sampled:	26-30/09/2016
		Date Received:	07/10/2016
Contact:	Richard Brown	Date Tested:	19/10/2016
Site Name:	Rail Central	Sampled By:	RB/MOB
Site Address:	Not Given		

Test results

Laboratory Reference	Sample Reference	Location	Depth Top [m]	Depth Base [m]	Sample Type	Description	Moisture Content [%]
641682	Not Given	TPG006	2	2.1	B	Grey CLAY	25
641683	Not Given	TPG010	2.5	2.6	B	Yellowish brown to grey slightly sandy CLAY	26
641684	Not Given	TPR012+ TPG008	0.5	0.8	B	Yellowish brown slightly sandy CLAY	24
641685	Not Given	TPG029	1.3	1.5	B	Yellowish brown slightly clayey gravelly fine to coarse SAND	11
641686	Not Given	TPG038	1.3	1.5	B	Orange slightly gravelly SAND	4.3
641687	Not Given	TPG044	1.2	1.6	B	Yellowish brown slightly gravelly clayey fine to coarse SAND	12
641688	Not Given	TPG037	0.6	0.9	B	Orange to grey CLAY	72
641689	Not Given	TPG037	1	1.2	B	Grey CLAY with pockets of orange sand	73
641690	Not Given	TPA047	0.4	0.9	B	Orangish brown slightly sandy CLAY	29
641691	Not Given	TPA047	1.1	1.4	B	Yellowish brown gravelly sandy CLAY	37

Remarks

Approved:

Mirosława Pytlik
PL Head of
Geotechnical Section

Date Reported: 26/10/2016

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

for and on behalf of i2 Analytical Ltd

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The results included within the report are representative of the samples submitted for analysis.
The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland."

TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

Tested in Accordance with BS1377-2: 1990: Clause 4.3 & 5: Definitive Method

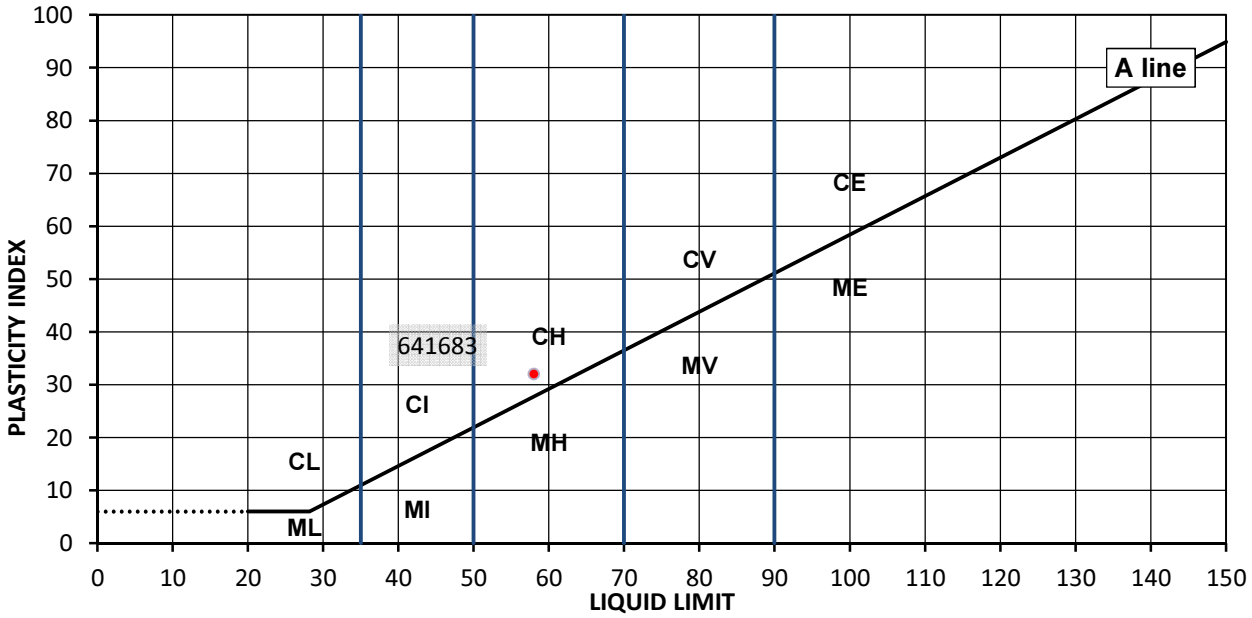
Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-29797
		Date Sampled:	29/09/2016
		Date Received:	07/10/2016
Contact:	Richard Brown	Date Tested:	19/10/2016
Site Name:	Rail Central	Sampled By:	RB/MOB
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference: 641683
Sample Reference: Not Given

Description:	Yellowish brown to grey slightly sandy CLAY	Sample Type:	B
Location:	TPG010	Depth Top [m]:	2.5
Sample Preparation:	Tested in natural condition	Depth Base [m]:	2.6

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
26	58	26	32	100



Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Remarks

Approved:

Mirosława Pytlik
PL Deputy of Head of
Geotechnical Section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 26/10/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

Tested in Accordance with BS1377-2: 1990: Clause 4.3 & 5: Definitive Method

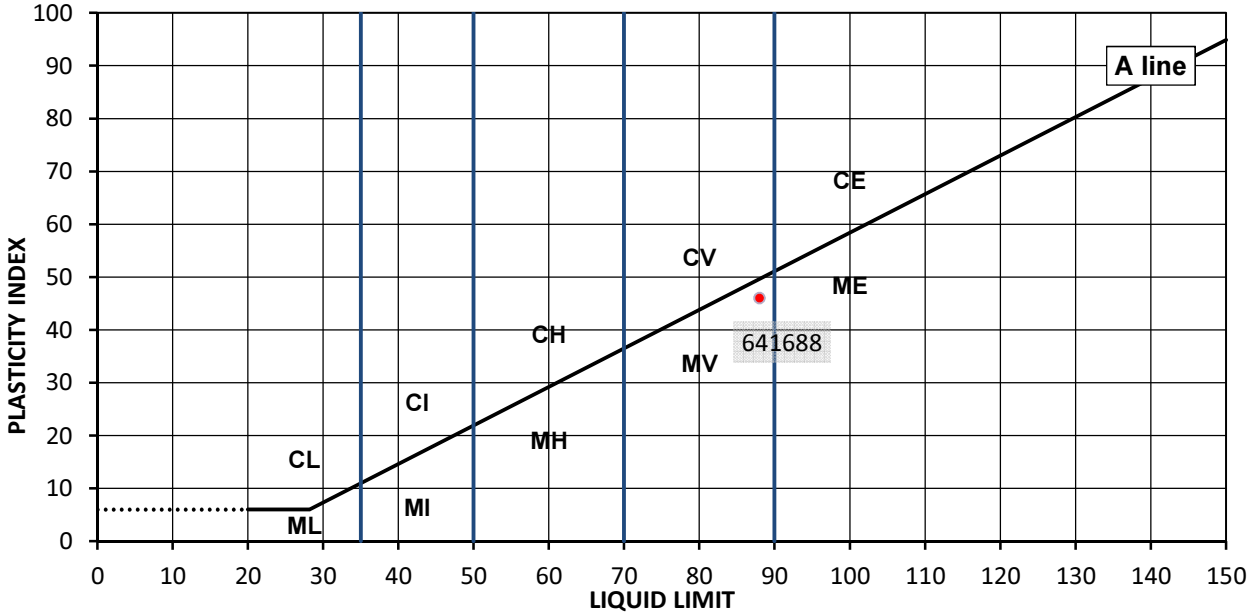
Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-29797
		Date Sampled:	27/09/2016
		Date Received:	07/10/2016
Contact:	Richard Brown	Date Tested:	19/10/2016
Site Name:	Rail Central	Sampled By:	RB/MOB
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference: 641688
Sample Reference: Not Given

Description:	Orange to grey CLAY	Sample Type:	B
Location:	TPG037	Depth Top [m]:	0.6
Sample Preparation:	Tested in natural condition	Depth Base [m]:	0.9

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
72	88	42	46	100



Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Remarks

Approved:

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Signed:

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TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

Tested in Accordance with BS1377-2: 1990: Clause 4.3 & 5: Definitive Method

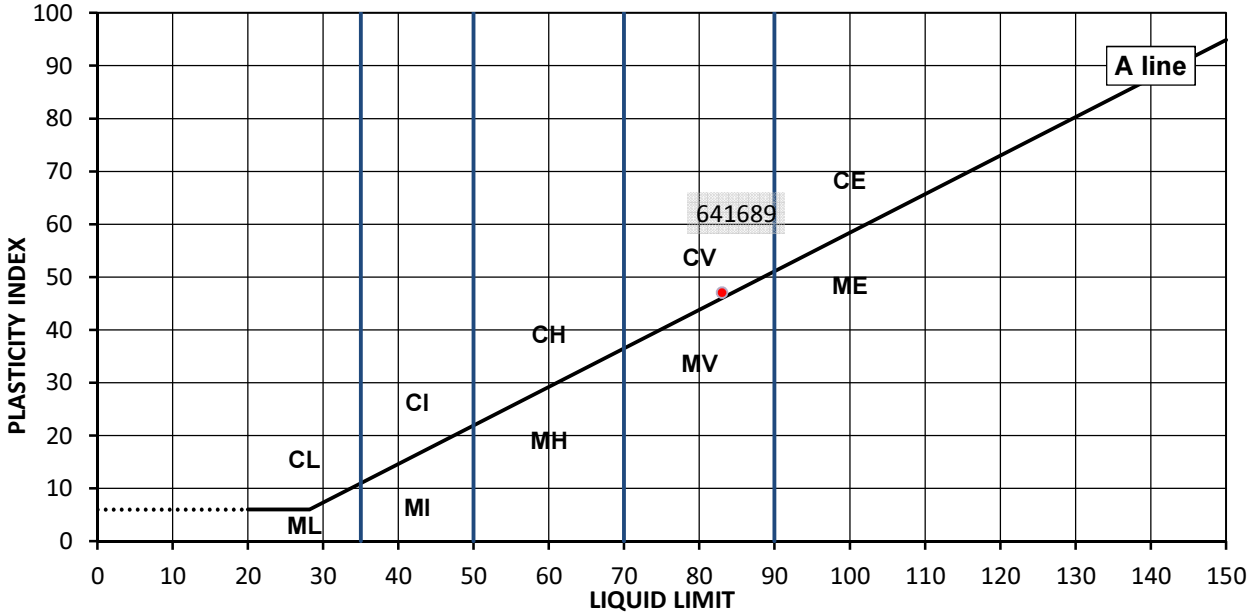
Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-29797
		Date Sampled:	27/09/2016
		Date Received:	07/10/2016
Contact:	Richard Brown	Date Tested:	19/10/2016
Site Name:	Rail Central	Sampled By:	RB/MOB
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference: 641689
Sample Reference: Not Given

Description:	Grey CLAY with pockets of orange sand	Sample Type:	B
Location:	TPG037	Depth Top [m]:	1
Sample Preparation:	Tested in natural condition	Depth Base [m]:	1.2

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
73	83	36	47	100



Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Remarks

Approved:

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PL Deputy of Head of
Geotechnical Section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 26/10/2016

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TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

4041

Tested in Accordance with BS1377-2: 1990: Clause 4.3 & 5: Definitive Method

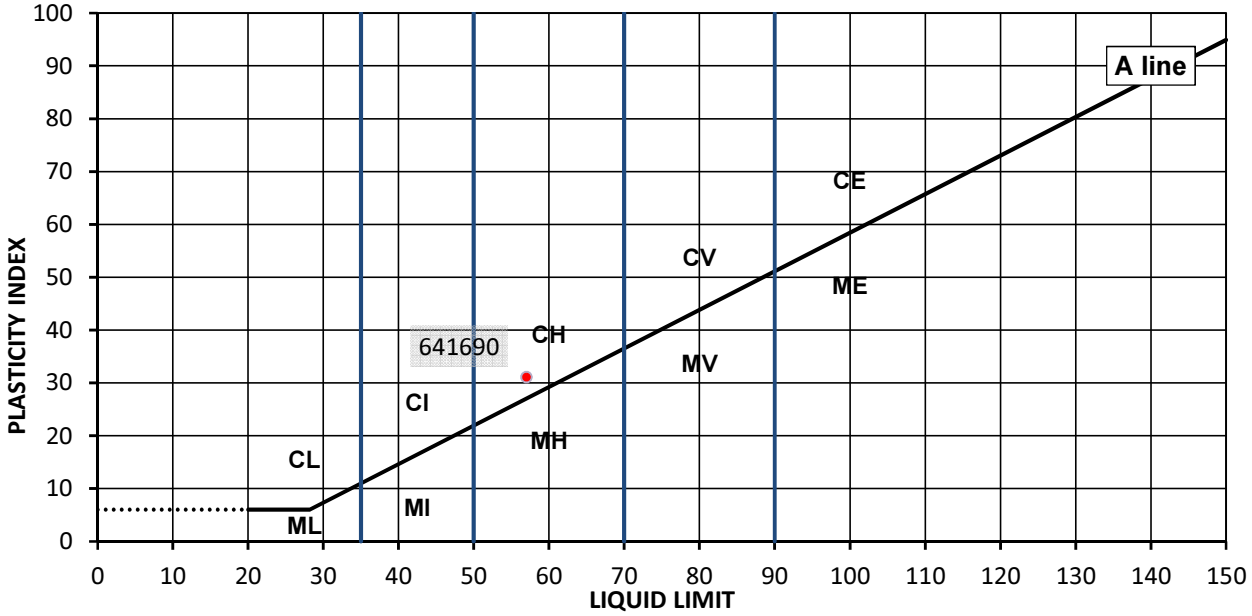
Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-29797
		Date Sampled:	26/09/2016
		Date Received:	07/10/2016
Contact:	Richard Brown	Date Tested:	19/10/2016
Site Name:	Rail Central	Sampled By:	RB/MOB
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference: 641690
Sample Reference: Not Given

Description:	Orangish brown slightly sandy CLAY	Sample Type:	B
Location:	TPA047	Depth Top [m]:	0.4
Sample Preparation:	Tested after >425um removed by hand	Depth Base [m]:	0.9

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
29	57	26	31	100



Legend, based on BS 5930:1999 +A2: 2010 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Remarks

Approved:

Mirosława Pytlik
PL Deputy of Head of
Geotechnical Section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 26/10/2016

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TEST CERTIFICATE

Summary of Classification Test Results

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

Client: Hydrock Consultants Ltd
Client Address: 2-4 Hawthorne Park
Holdenby Road
Spratton, Northampton
NN6 8LD
Contact: Richard Brown
Site Name: Rail Central
Site Address: Not Given

Client Reference: C151171
Job Number: 16-29797
Date Sampled: 26,27,29/09/2016
Date Received: 07/10/2016
Date Tested: 19/10/2016
Sampled By: RB/MOB

Test results

Laboratory Reference	Hole No.	Sample				Soil Description	Density		M/C	Attenberg				PD
		Reference	Top depth [m]	Base depth [m]	Type		bulk Mg/m3	dry Mg/m3	%	% Passing 425um %	LL %	PL %	PI %	Mg/m3
641683	TPG010	Not Given	2.50	2.60	B	Yellowish brown to grey slightly sandy CLAY	-	-	26	100	58	26	32	-
641688	TPG037	Not Given	0.60	0.90	B	Orange to grey CLAY	-	-	72	100	88	42	46	-
641689	TPG037	Not Given	1.00	1.20	B	Grey CLAY with pockets of orange sand	-	-	73	100	83	36	47	-
641690	TPA047	Not Given	0.40	0.90	B	Orangish brown slightly sandy CLAY	-	-	29	100	57	26	31	-

Comments:

Approved:

Mirosława Pytlik
PL Head of Geotechnical Section

Signed:

Sushil Sharda
Technical Manager (Geotechnical Division)

Date Reported: 26/10/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Particle Size Distribution

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

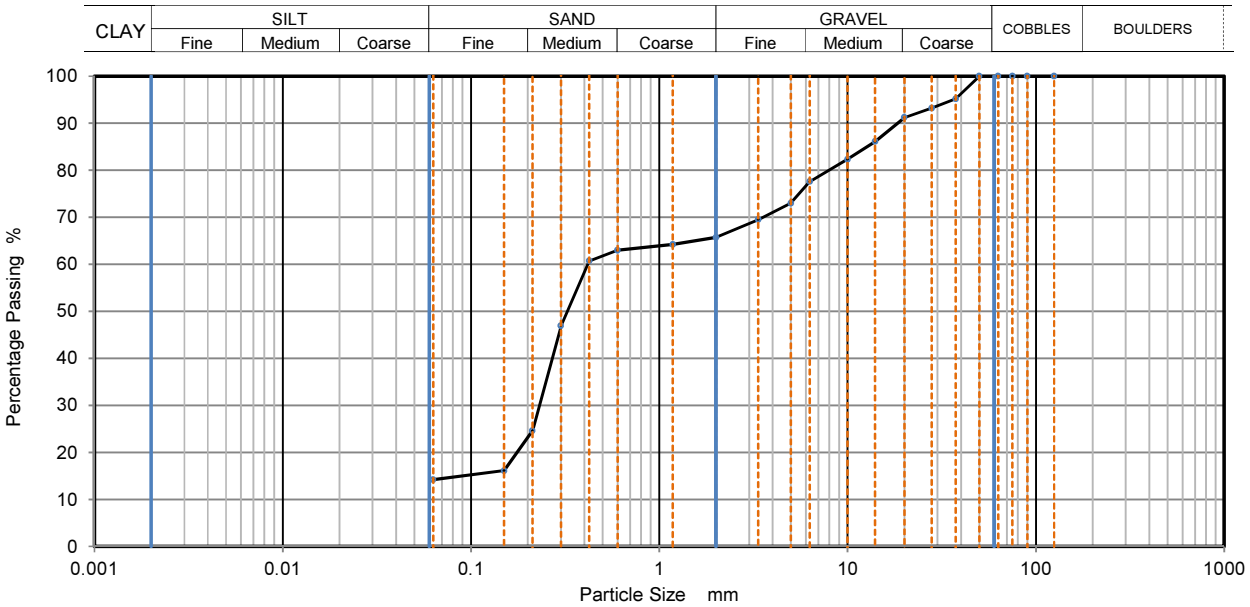
UKAS TESTING 4041

Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-29797
		Date Sampled:	27/09/2016
		Date Received:	07/10/2016
Contact:	Richard Brown	Date Tested:	18/10/2016
Site Name:	Rail Central	Sampled By:	RB/MOB
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference:	641685	Sample Reference:	Not Given
Sample description:	Yellowish brown slightly clayey gravelly fine to coarse SAND	Sample Type:	B
Location:	TPG029	Depth Top [m]:	1.3
Supplier:	Not Given	Depth Base [m]:	1.5



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	95		
28	93		
20	91		
14	86		
10	82		
6.3	78		
5	73		
3.35	70		
2	66		
1.18	64		
0.6	63		
0.425	61		
0.3	47		
0.212	25		
0.15	16		
0.063	14		

Dry Mass of sample [g]: 2148

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	34.30
Sand	51.50
Fines <0.063mm	14.20

Grading Analysis		
D100	mm	50
D60	mm	0.418
D30	mm	0.231
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Approved:

Mirosława Pytlik
PL Head of
Geotechnical Section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 26/10/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Particle Size Distribution

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

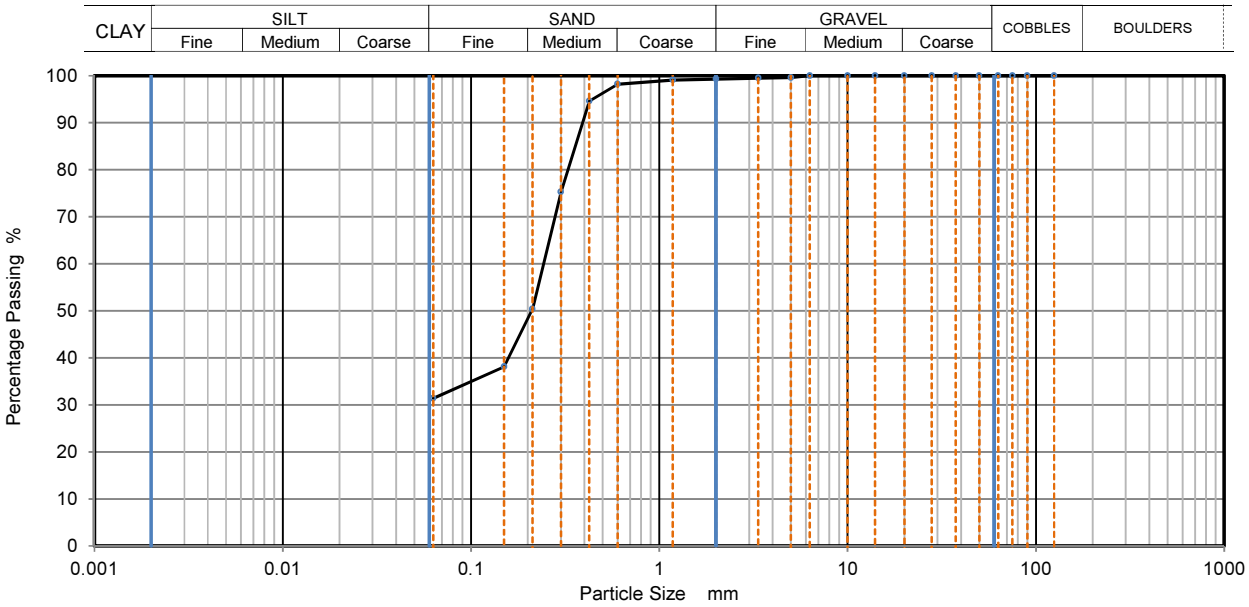
UKAS TESTING 4041

Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-29797
		Date Sampled:	26/09/2016
		Date Received:	07/10/2016
Contact:	Richard Brown	Date Tested:	18/10/2016
Site Name:	Rail Central	Sampled By:	RB/MOB
Site Address:	Not Given		

TEST RESULTS Laboratory Reference: 641687 Sample Reference: Not Given

Sample description:	Yellowish brown slightly gravelly clayey fine to coarse SAND	Sample Type:	B
Location:	TPG044	Depth Top [m]:	1.2
Supplier:	Not Given	Depth Base [m]:	1.6



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	99		
1.18	99		
0.6	98		
0.425	95		
0.3	75		
0.212	50		
0.15	38		
0.063	31		

Dry Mass of sample [g]: 541

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	0.70
Sand	67.90
Fines <0.063mm	31.40

Grading Analysis		
D100	mm	6.3
D60	mm	0.242
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Approved:

Mirosława Pytlik
PL Head of
Geotechnical Section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 26/10/2016

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TEST CERTIFICATE

Determination of California Bearing Ratio

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

4041

Tested in Accordance with BS 1377-4: 1990: Clause 7

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-29797
		Date Sampled:	30/09/2016
		Date Received:	07/10/2016
Contact:	Richard Brown	Date Tested:	19/10/2016
Site Name:	Rail Central	Sampled By:	RB/MOB
Site Address:	Not Given		

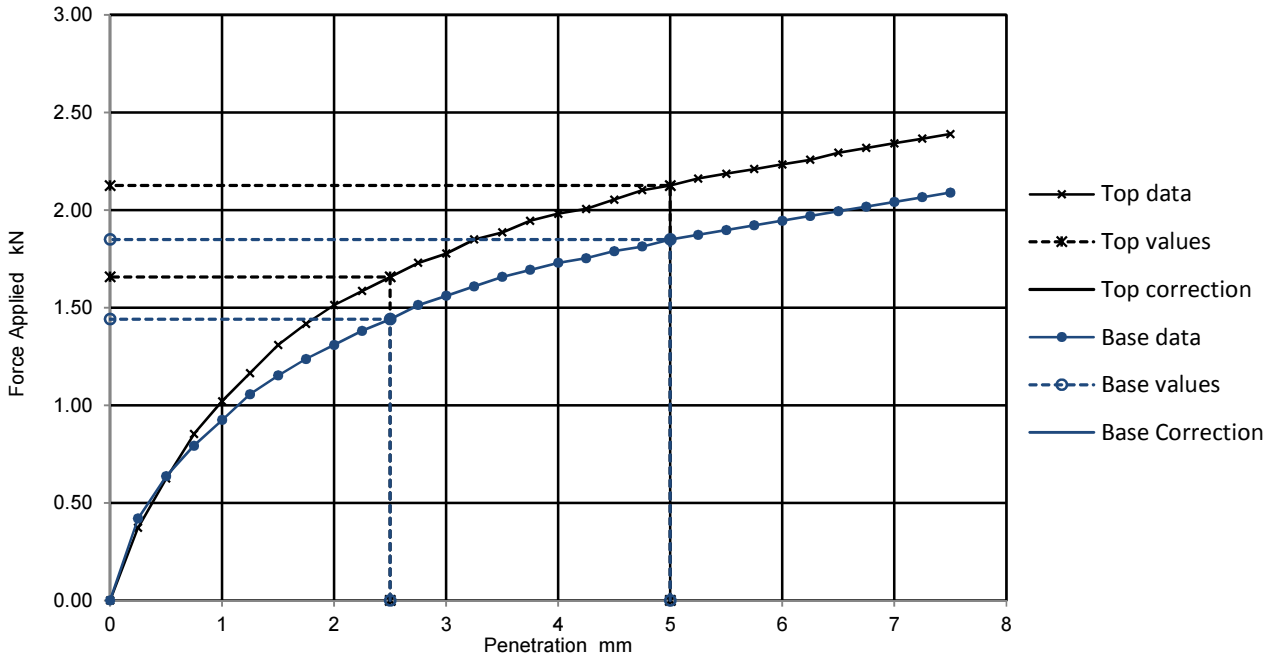
Test Results:

Laboratory Reference:	641684	Depth Top [m]:	0.5
Hole No.:	TPR012+TPG008	Depth Base [m]:	0.8
Sample Reference:	Not Given	Sample Type:	B

Specimen Preparation

Condition	Remoulded			Soaking details	Not soaked	
Details	Recompacted with specified standard effort using 2.5kg rammer			Period of soaking		days
				Time to surface		days
Sample Description:	Yellowish brown slightly sandy CLAY			Amount of swell recorded		mm
Material retained on 20mm sieve removed		0	%	Dry density after soaking		Mg/m3
Initial Specimen details	Bulk density	1.94	Mg/m3	Surcharge applied	8	kg
	Dry density	1.57	Mg/m3		4.8	kPa
	Moisture content	23.4	%			

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP	No	13.0	11.0	13.0	12.0	23.6
BASE	No	11.0	9.2	11.0		23.1

Remarks:

Test/ Specimen specific remarks:

Aproved:

Mirosława Pytlik
PL Head of Geotechnical Section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 26/10/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of California Bearing Ratio

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

4041

Tested in Accordance with BS 1377-4: 1990: Clause 7

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-29797
		Date Sampled:	27/09/2016
		Date Received:	07/10/2016
Contact:	Richard Brown	Date Tested:	19/10/2016
Site Name:	Rail Central	Sampled By:	RB/MOB
Site Address:	Not Given		

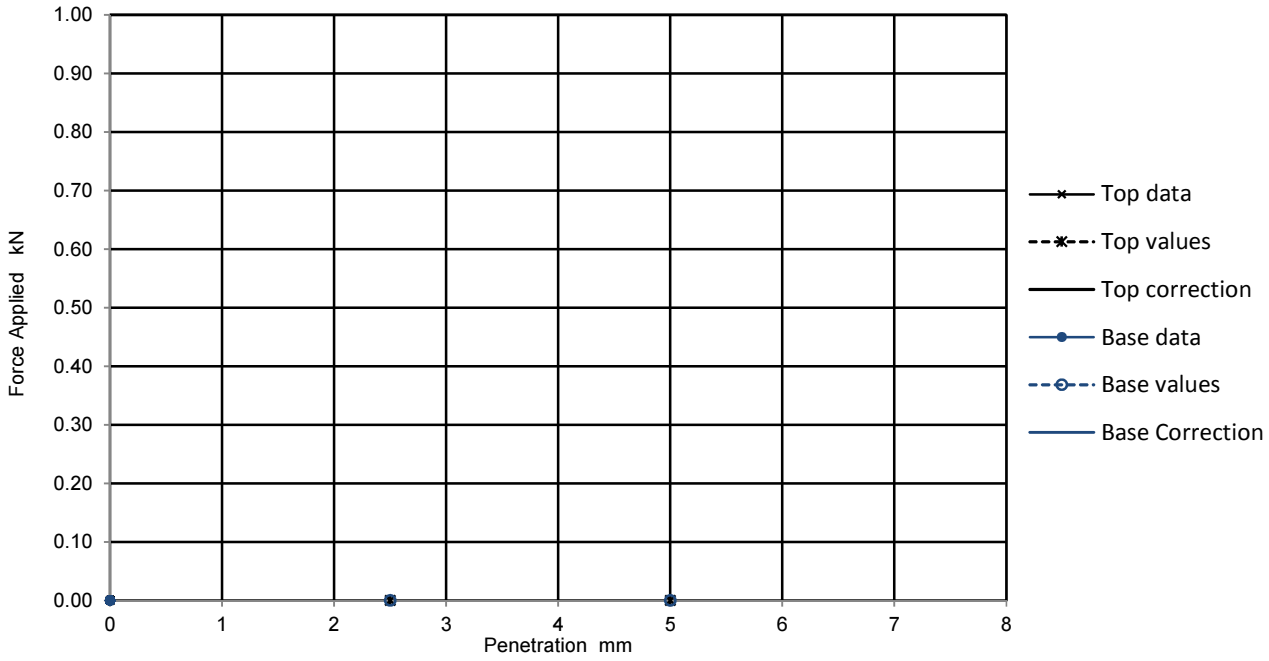
Test Results:

Laboratory Reference:	641688	Depth Top [m]:	0.6	
Hole No.:	TPG037	Depth Base [m]:	0.9	
Sample Reference:	Not Given	Sample Type:	B	

Specimen Preparation

Condition	Remoulded			Soaking details	Not soaked	
Details	Recompacted with specified standard effort using 2.5kg rammer			Period of soaking		days
				Time to surface		days
Sample Description:	Orange to grey CLAY			Amount of swell recorded		mm
Material retained on 20mm sieve removed		0	%	Dry density after soaking		Mg/m3
Initial Specimen details	Bulk density	1.59	Mg/m3	Surcharge applied	8	kg
	Dry density	0.96	Mg/m3		4.9	kPa
	Moisture content	65.6	%			

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, %				Moisture Content %
		2.5mm	5mm	Highest	Average	
TOP						
BASE						

Remarks: Sample is very soft

Test/ Specimen specific remarks:

Aproved:

Mirosława Pytlik
PL Head of Geotechnical Section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 26/10/2016

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Light Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

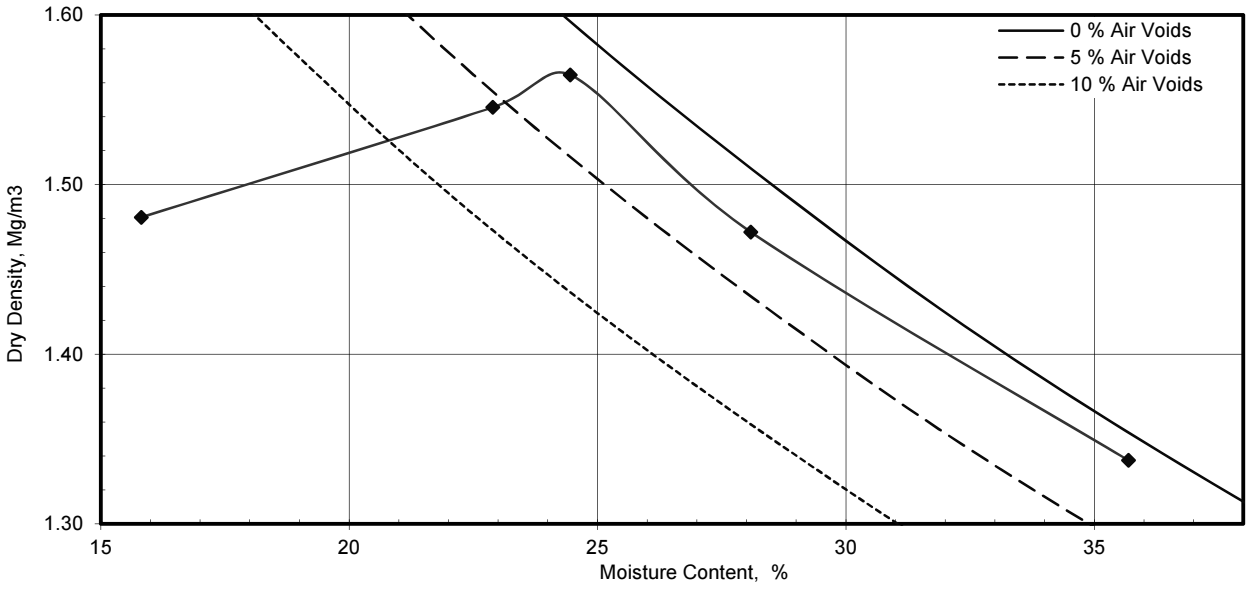
UKAS TESTING 4041

Tested in accordance with BS 1377-4:1990: Clause 3.3 using 2.5kg[light] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-29797
		Date Sampled:	26/09/2016
		Date Received:	07/10/2016
		Date Tested:	18/10/2016
Contact:	Richard Brown	Sampled By:	RB/MOB
Site Name:	Rail Central		
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference:	641691		
Hole No.:	TPA047	Depth Top [m]:	1.1
Sample Reference:	Not Given	Depth Base [m]:	1.4
Sample Description:	Yellowish brown gravelly sandy CLAY	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	4
Particle Density - Measured using gas jar	Mg/m³	2.62

Maximum Dry Density	Mg/m³	**1.56**

Optimum Moisture Content	%	**24**

Remarks

Aproved:

Mirosława Pytlik
PL Head of
Geotechnical Section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 26/10/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Heavy Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

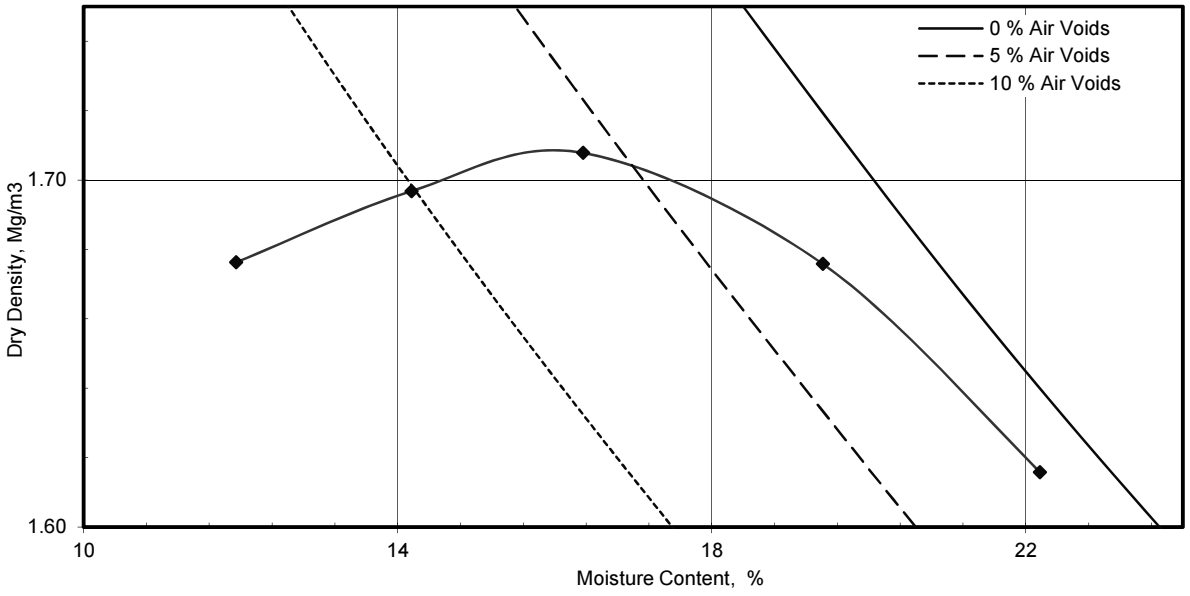
Environmental Science

Tested in accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-29797
		Date Sampled:	29/09/2016
		Date Received:	07/10/2016
Contact:	Richard Brown	Date Tested:	18/10/2016
Site Name:	Rail Central	Sampled By:	RB/MOB
Site Address:	Not Given		

TEST REPORTS

Laboratory Reference:	641682		
Hole No.:	TPG006	Depth Top [m]:	2
Sample Reference:	Not Given	Depth Base [m]:	2.1
Sample Description:	Grey CLAY	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	2.58

Maximum Dry Density	Mg/m³	**1.71**

Optimum Moisture Content	%	**16**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical Section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 26/10/2016

for and on behalf of i2 Analytical Ltd

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The results included within the report are representative of the samples submitted for analysis.
The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland."

TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Heavy Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

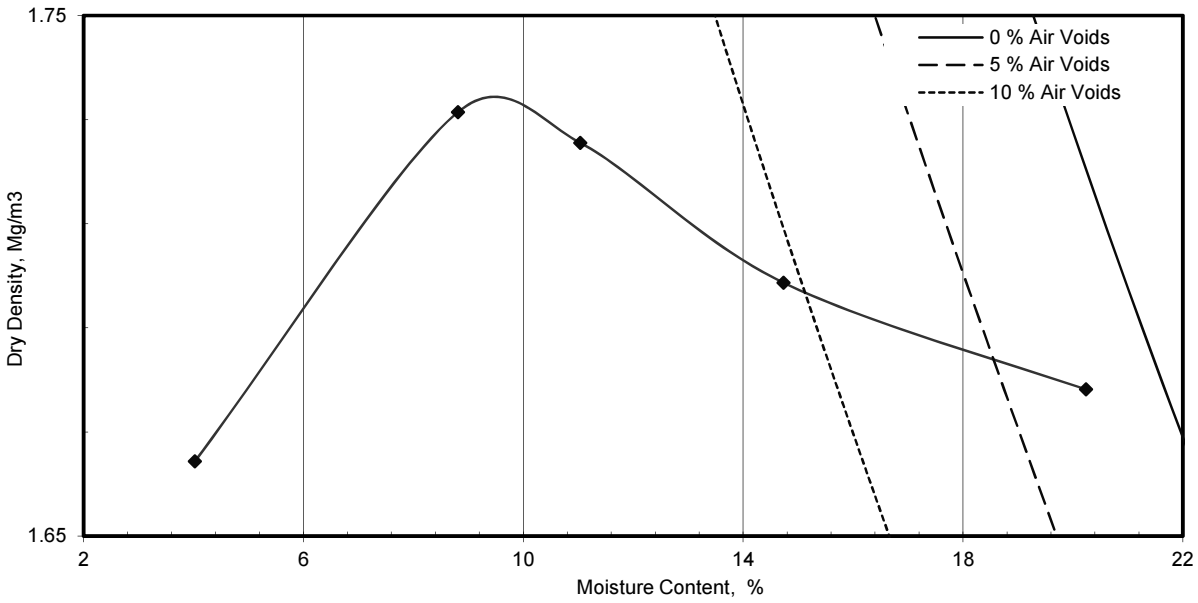
Environmental Science

Tested in accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-29797
		Date Sampled:	27/09/2016
		Date Received:	07/10/2016
Contact:	Richard Brown	Date Tested:	18/10/2016
Site Name:	Rail Central	Sampled By:	RB/MOB
Site Address:	Not Given		

TEST REPORTS

Laboratory Reference:	641686		
Hole No.:	TPG038	Depth Top [m]:	1.3
Sample Reference:	Not Given	Depth Base [m]:	1.5
Sample Description:	Orange slightly gravelly SAND	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured using gas jar	Mg/m³	2.64

Maximum Dry Density	Mg/m³	**1.73**

Optimum Moisture Content	%	**9.5**

Remarks

Aproved:

Mirosława Pytlik
PL Head of Geotechnical Section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 26/10/2016

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Particle Density

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

Tested in Accordance with BS 1377-2: 1990: Clause 8.2

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawthorne Park Holdenby Road Spratton, Northampton NN6 8LD	Job Number:	16-29797
		Date Sampled:	26,27,29/09/2016
		Date Received:	07/10/2016
Contact:	Richard Brown	Date Tested:	25/10/2016
Site Name:	Rail Central	Sampled By:	RB/MOB
Site Address:	NotGiven		

TEST RESULTS

Laboratory Reference:	Hole No.:	Sample				Soil Description at test horizon	Particle Density Mg/m3	Remarks
		Sample Reference	Depth Top [m]	Depth Base [m]	Sampe Type			
641682	TPG006	Not Given	2.0	2.1	B	Grey CLAY	2.58	-
641686	TPG038	Not Given	1.3	1.5	B	Orange slightly gravelly SAND	2.64	-
641691	TPA047	Not Given	1.1	1.4	B	Yellowish brown gravelly sandy CLAY	2.62	-

Preparation Details:

Approved:

Mirosława Pytlik
PL Head of
Geotechnical Section

Date Reported: 26/10/2016

Signed:

Sushil Sharda
Technical Manager
(Geotechnical
Division)

for and on behalf of i2 Analytical Ltd

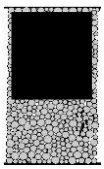
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Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth			1.20 - 1.65
Description			Yellowish brown slightly sandy CLAY with thin laminae of grey clay
Type			U
Initial Sample Length	L_0	(mm)	193.7
Initial Sample Diameter	D_0	(mm)	97.2
Initial Sample Weight	W_0	(gr)	3005.2
Bulk Density	ρ_0	(Mg/m3)	2.09
Particle Density	ρ_s	(Mg/m3)	2.65

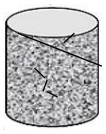
Initial Conditions

Initial Cell Pressure	σ_3	(kPa)	24
Strain Rate	m_S	(mm/min)	3.87480
MembraneThickness	m_b	(mm)	0.27
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 1
Initial Moisture	$\omega_i\%$	(%)	20
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.74
Initial Voids Ratio	e_0	.	0.53
Initial Degree of Saturation	S_o	(%)	100

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	83
MembraneCorrection	m_C	(kPa)	0.932
Strain At Max Stress	$\varepsilon_f\%$	(%)	15.51
Shear Strength	c_U	(kPa)	42
Final Moisture	$\omega_f\%$	(%)	20
Final Dry Density	ρ_{df}	(Mg/m3)	1.74
Final Voids Ratio	e_f	.	0.53
Final Degree of Saturation	S_f	(%)	100.0





Failure Sketch

(surface inclination)

Notes

Test Method	BS1377-7 : 1990 Clause 8			Test Name	659199
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	24/11/2016
Site Reference	Rail Central			Borehole	BHA003
Jobfile	16-32990			Sample	659199
Client	Hydrock Consultants			Depth	1.20 - 1.65
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

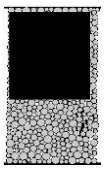
i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS
i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth	3.20 - 3.65		
Description	Dark grey CLAY		
Type	U		
Initial Sample Length	L_0	(mm)	198.6
Initial Sample Diameter	D_0	(mm)	97.2
Initial Sample Weight	W_0	(gr)	2993.3
Bulk Density	ρ_0	(Mg/m3)	2.03
Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

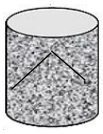
Initial Cell Pressure	σ_3	(kPa)	64
Strain Rate	m_s	(mm/min)	3.97220
MembraneThickness	m_b	(mm)	0.24
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 1
Initial Moisture	$\omega_i\%$	(%)	27
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.60
Initial Voids Ratio	e_0	.	0.66
Initial Degree of Saturation	S_o	(%)	100

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	121
MembraneCorrection	m_c	(kPa)	0.819
Strain At Max Stress	$\varepsilon_f\%$	(%)	14.51
Shear Strength	c_u	(kPa)	61
Final Moisture	$\omega_f\%$	(%)	27
Final Dry Density	ρ_{df}	(Mg/m3)	1.60
Final Voids Ratio	e_f	.	0.66
Final Degree of Saturation	S_f	(%)	100.0

Notes





Failure Sketch

(surface inclination)

Test Method	BS1377-7 : 1990 Clause 8			Test Name	659200
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	24/11/2016
Site Reference	Rail Central			Borehole	BHA003
Jobfile	16-32990			Sample	659200
Client	Hydrock Consultants			Depth	3.20 - 3.65
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

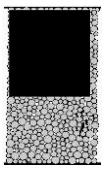
i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS
i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth	3.20 - 3.60		
Description	Brownish grey to yellowish brown CLAY		
Type	U		
Initial Sample Length	L_0	(mm)	198.4
Initial Sample Diameter	D_0	(mm)	99.0
Initial Sample Weight	W_0	(gr)	2956.5
Bulk Density	ρ_0	(Mg/m3)	1.94
Particle Density	ρ_s	(Mg/m3)	2.65

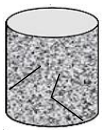
Initial Conditions

Initial Cell Pressure	σ_3	(kPa)	64
Strain Rate	m_S	(mm/min)	3.96700
MembraneThickness	m_b	(mm)	0.28
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 1
Initial Moisture	$\omega_i\%$	(%)	26
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.53
Initial Voids Ratio	e_0	.	0.73
Initial Degree of Saturation	S_o	(%)	96

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	179
MembraneCorrection	m_C	(kPa)	0.620
Strain At Max Stress	$\varepsilon_f\%$	(%)	8.06
Shear Strength	c_U	(kPa)	89
Final Moisture	$\omega_f\%$	(%)	26
Final Dry Density	ρ_{df}	(Mg/m3)	1.53
Final Voids Ratio	e_f	.	0.73
Final Degree of Saturation	S_f	(%)	95.7





Failure Sketch

(surface inclination)

Notes

Test Method	BS1377-7 : 1990 Clause 8			Test Name	659201
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	24/11/2016
Site Reference	Rail Central			Borehole	BHL005
Jobfile	16-32990			Sample	659201
Client	Hydrock Consultants			Depth	3.20 - 3.60
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

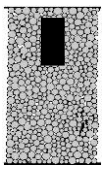
i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS
i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth	4.20 - 4.60		
Description	Dark grey CLAY		
Type	U		
Initial Sample Length	L_0	(mm)	76.1
Initial Sample Diameter	D_0	(mm)	37.2
Initial Sample Weight	W_0	(gr)	154.0
Bulk Density	ρ_0	(Mg/m3)	1.86
Particle Density	ρ_s	(Mg/m3)	2.65

Initial Conditions

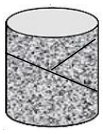
Initial Cell Pressure	σ_3	(kPa)	84
Strain Rate	m_s	(mm/min)	1.52260
MembraneThickness	m_b	(mm)	0.26
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 1
Initial Moisture	$\omega_i\%$	(%)	17
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.59
Initial Voids Ratio	e_0	.	0.66
Initial Degree of Saturation	S_o	(%)	67

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	138
MembraneCorrection	m_c	(kPa)	1.066
Strain At Max Stress	$\varepsilon_f\%$	(%)	4.72
Shear Strength	c_u	(kPa)	69
Final Moisture	$\omega_f\%$	(%)	17
Final Dry Density	ρ_{df}	(Mg/m3)	1.59
Final Voids Ratio	e_f	.	0.66
Final Degree of Saturation	S_f	(%)	67.4

Notes

Unable to take a photo



Failure Sketch

(surface inclination)

Test Method	BS1377-7 : 1990 Clause 8			Test Name	659202
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	24/11/2016
Site Reference	Rail Central			Borehole	BHL005
Jobfile	16-32990			Sample	659202
Client	Hydrock Consultants			Depth	4.20 - 4.60
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

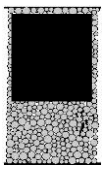
i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS
i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Total Stress Triaxial Compression

Unconsolidated Undrained (Single Stage)

Summary Report

Sample Details



sketch showing specimen location in original sample

Depth	2.00 - 2.45		
Description	Dark grey CLAY		
Type	U		
Initial Sample Length	L_0	(mm)	196.8
Initial Sample Diameter	D_0	(mm)	98.9
Initial Sample Weight	W_0	(gr)	3142.9
Bulk Density	ρ_0	(Mg/m3)	2.08
Particle Density	ρ_s	(Mg/m3)	2.65

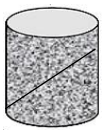
Initial Conditions

Initial Cell Pressure	σ_3	(kPa)	40
Strain Rate	m_S	(mm/min)	3.93600
MembraneThickness	m_b	(mm)	0.29
Displacement Input	L_{IP}	(mm)	CH 2
Load Input	N_{IP}	(N)	CH 1
Initial Moisture	$\omega_i\%$	(%)	22
Initial Dry Density	ρ_{d0}	(Mg/m3)	1.71
Initial Voids Ratio	e_0	.	0.55
Initial Degree of Saturation	S_o	(%)	100

Final Conditions

Max Deviator Stress	$(\sigma_1-\sigma_3)_f$	(kPa)	309
MembraneCorrection	m_C	(kPa)	0.566
Strain At Max Stress	$\varepsilon_f\%$	(%)	7.37
Shear Strength	c_U	(kPa)	155
Final Moisture	$\omega_f\%$	(%)	22
Final Dry Density	ρ_{df}	(Mg/m3)	1.71
Final Voids Ratio	e_f	.	0.55
Final Degree of Saturation	S_f	(%)	100.0





Failure Sketch

(surface inclination)

Notes

Test Method	BS1377-7 : 1990 Clause 8			Test Name	659203
Database: .\SQLEXPRESS \ 6171-I2 Analytical				Test Date	24/11/2016
Site Reference	Rail Central			Borehole	BHL007
Jobfile	16-32990			Sample	659203
Client	Hydrock Consultants			Depth	2.00 - 2.45
Operator	palmowskia	Checked	pytlikm	Approved	pytlikm

i2 Analytical Limited, 7 Woodshots Meadow, Croxley Green Business Park, Herts WD18 8YS
i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

TEST CERTIFICATE

Determination of Moisture Content

Tested in Accordance with BS 1377-2:1990: Clause 3.2

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawtorne Park Holdenby Road Spratton, Northamptonshire NN6 8LD	Job Number:	17-47339
		Date Sampled:	20/04/2017
		Date Received:	02/05/2017
Contact:	Riichard Brown	Date Tested:	10/05 - 11/05/2017
Site Name:	Rail Central	Sampled By:	AA
Site Address:	Not Given		

Test results

Laboratory Reference	Sample Reference	Location	Depth Top [m]	Depth Base [m]	Sample Type	Description	Moisture Content [%]
743551	Not Given	TPG001	1.4	2.4	B	Brown clayey slightly sandy GRAVEL	26
743552	Not Given	TPG002	0.9	1.5	B	Yellowish brown slightly sandy gravelly CLAY	21
743553	Not Given	TPG017	1.4	2	B	Brown slightly gravelly clayey SAND	15

Remarks

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 16/05/2017

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

Tested in Accordance with BS1377-2: 1990: Clause 4.3 & 5: Definitive Method

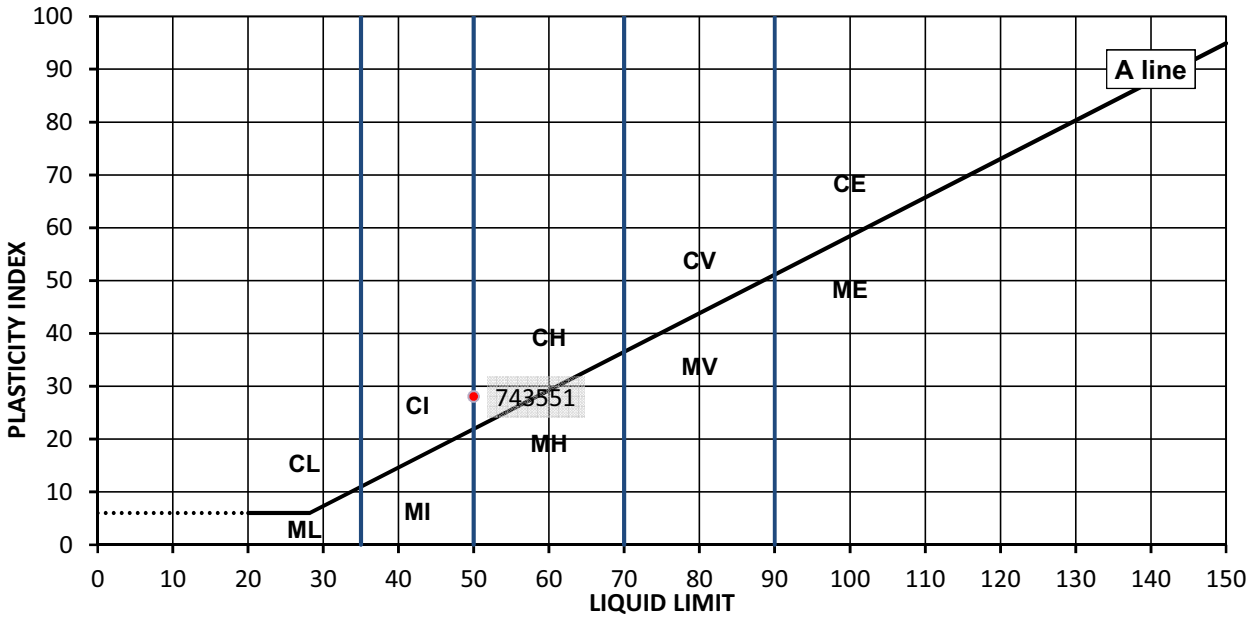
Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawtorne Park Holdenby Road Spratton, Northamptonshire NN6 8LD	Job Number:	17-47339
		Date Sampled:	20/04/2017
		Date Received:	02/05/2017
Contact:	Richard Brown	Date Tested:	10/05/2017
Site Name:	Rail Central	Sampled By:	AA
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference: 743551
Sample Reference: Not Given

Description:	Brown clayey slightly sandy GRAVEL	Sample Type:	B
Location:	TPG001	Depth Top [m]:	1.4
Sample Preparation:	Tested after washing to remove >425um	Depth Base [m]:	2.4

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
26	50	22	28	14



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Remarks

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 16/05/2017

for and on behalf of i2 Analytical Ltd

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The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland."

TEST CERTIFICATE

Determination of Particle Size Distribution

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

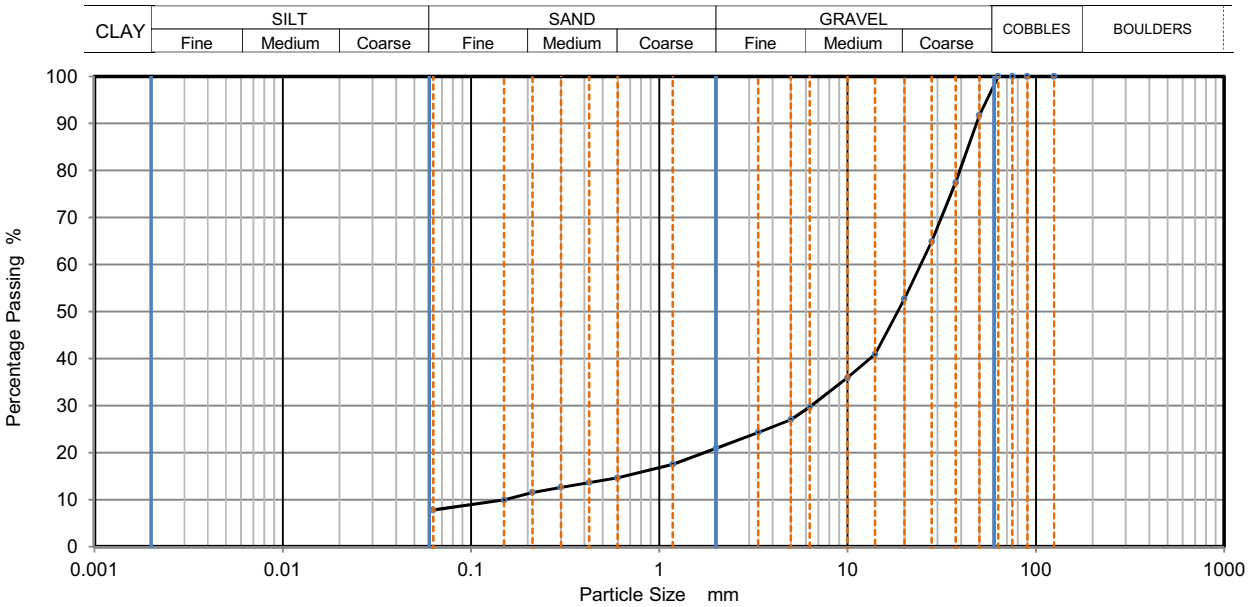
4041

Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawtorne Park Holdenby Road Spratton, Northamptonshire NN6 8LD	Job Number:	17-47339
		Date Sampled:	20/04/2017
		Date Received:	02/05/2017
Contact:	Richard Brown	Date Tested:	10/05/2017
Site Name:	Rail Central	Sampled By:	AA
Site Address:	Not Given		

TEST RESULTS Laboratory Reference: 743551

Sample description:	Brown clayey slightly sandy GRAVEL	Sample Reference:	Not Given
Location:	TPG001	Sample Type:	B
Supplier:	Not Given	Depth Top [m]:	1.4
		Depth Base [m]:	2.4



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	92		
37.5	77		
28	65		
20	53		
14	41		
10	36		
6.3	30		
5	27		
3.35	24		
2	21		
1.18	18		
0.6	15		
0.425	14		
0.3	13		
0.212	12		
0.15	10		
0.063	8		

Dry Mass of sample [g]: 5444

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	79.10
Sand	13.10
Fines <0.063mm	7.80

Grading Analysis		
D100	mm	63
D60	mm	24.4
D30	mm	6.44
D10	mm	0.153
Uniformity Coefficient		160
Curvature Coefficient		11

Remarks

Preparation and testing in accordance with BS1377 unless noted below
The material submitted, fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 16/05/2017

for and on behalf of i2 Analytical Ltd

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The results included within the report are representative of the samples submitted for analysis.
The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland."

TEST CERTIFICATE

Determination of Particle Size Distribution

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

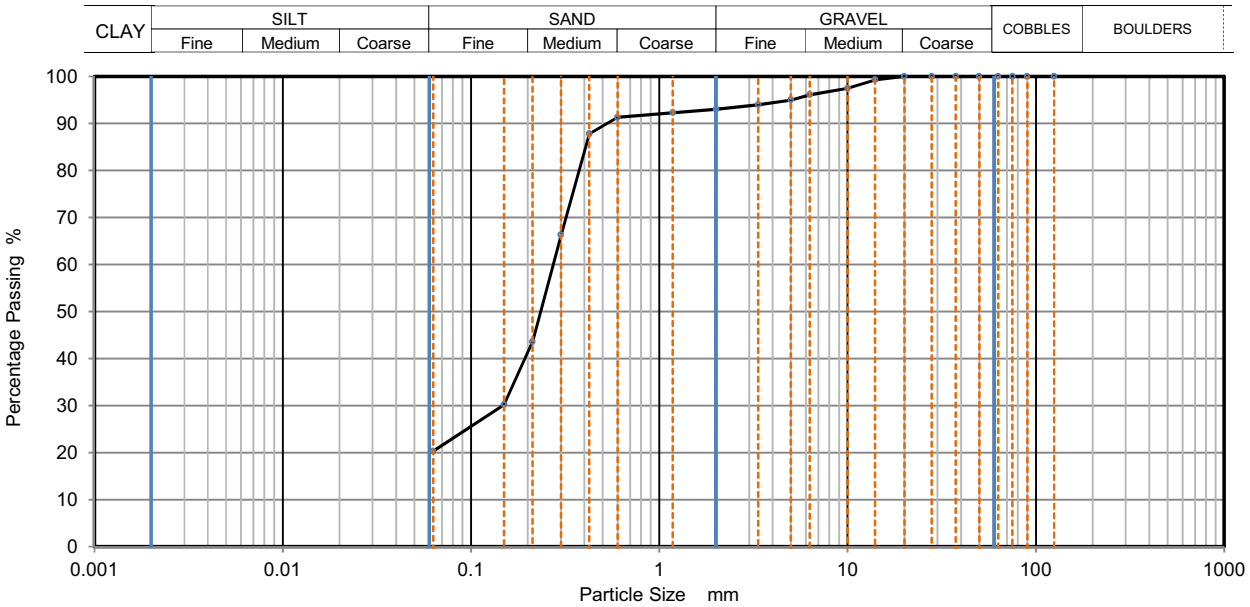
UKAS TESTING 4041

Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawtorne Park Holdenby Road Spratton, Northamptonshire NN6 8LD	Job Number:	17-47339
		Date Sampled:	20/04/2017
		Date Received:	02/05/2017
Contact:	Richard Brown	Date Tested:	10/05/2017
Site Name:	Rail Central	Sampled By:	AA
Site Address:	Not Given		

TEST RESULTS Laboratory Reference: 743553

Sample description:	Brown slightly gravelly clayey SAND	Sample Reference:	Not Given
Location:	TPG017	Sample Type:	B
Supplier:	Not Given	Depth Top [m]:	1.4
		Depth Base [m]:	2



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	98		
6.3	96		
5	95		
3.35	94		
2	93		
1.18	92		
0.6	91		
0.425	88		
0.3	66		
0.212	44		
0.15	30		
0.063	20		

Dry Mass of sample [g]: 1011

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	7.00
Sand	72.70
Fines <0.063mm	20.30

Grading Analysis		
D100	mm	20
D60	mm	0.272
D30	mm	0.148
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 16/05/2017

for and on behalf of i2 Analytical Ltd

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TEST CERTIFICATE

Dry Density / Moisture Content Relationship
Light Compaction

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

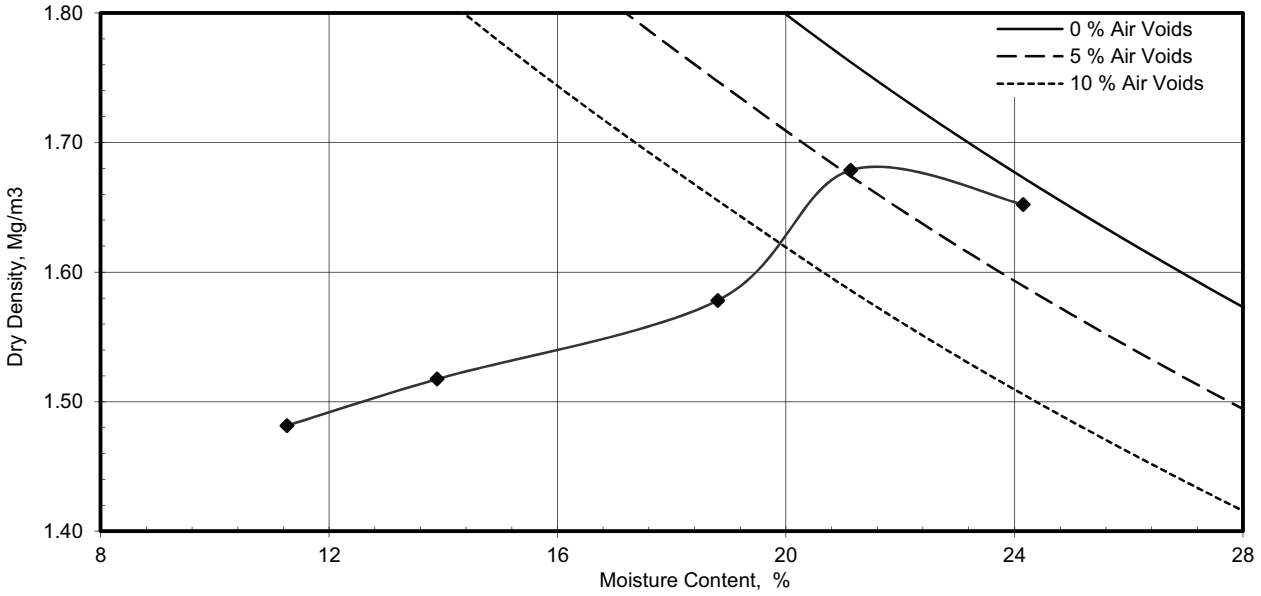
UKAS TESTING 4041

Tested in accordance with BS 1377-4:1990: Clause 3.3 using 2.5kg[light] Rammer

Client:	Hydrock Consultants Ltd	Client Reference:	C151171
Client Address:	2-4 Hawtorne Park Holdenby Road Spratton, Northamptonshire NN6 8LD	Job Number:	17-47339
		Date Sampled:	20/04/2017
		Date Received:	02/05/2017
		Date Tested:	11/05/2017
Contact:	Richard Brown	Sampled By:	AA
Site Name:	Rail Central		
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference:	743552		
Hole No.:	TPG002	Depth Top [m]:	0.9
Sample Reference:	Not Given	Depth Base [m]:	1.5
Sample Description:	Yellowish brown slightly sandy gravelly CLAY	Sample Type:	B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Composite specimens tested
Material Retained on 37.5 mm Sieve	%	5
Material Retained on 20.0 mm Sieve	%	11
Particle Density - Measured using gas jar	Mg/m³	2.81
As received Moisture Content	%	21
Maximum Dry Density	Mg/m³	**1.68**

Optimum Moisture Content	%	**21**

Remarks: Insufficient material supplied - compacted in proctor mould.

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

Date Reported: 16/05/2017

for and on behalf of i2 Analytical Ltd

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The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland."

TEST CERTIFICATE

Determination of Particle Density

Tested in Accordance with BS 1377-2: 1990: Clause 8.2

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

4041

Client: Hydrock Consultants Ltd
Client Address: 2-4 Hawtorne Park
Holdenby Road
Spratton, Northamptonshire
NN6 8LD
Contact: Richard Brown
Site Name: Rail Central
Site Address: Not Given

Client Reference: C151171
Job Number: 17-47339
Date Sampled: 20/04/2017
Date Received: 02/05/2017
Date Tested: 10/05/2017
Sampled By: AA

TEST RESULTS

Laboratory Reference:	Hole No.:	Sample				Soil Description at test horizon	Particle Density Mg/m3	Remarks
		Sample Reference	Depth Top [m]	Depth Base [m]	Sampe Type			
743552	TPG002	Not Given	0.9	1.5	B	Yellowish brown slightly sandy gravelly CLAY	2.81	

Preparation Details:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Signed:

Sushil Sharda
Technical Manager
(Geotechnical Division)

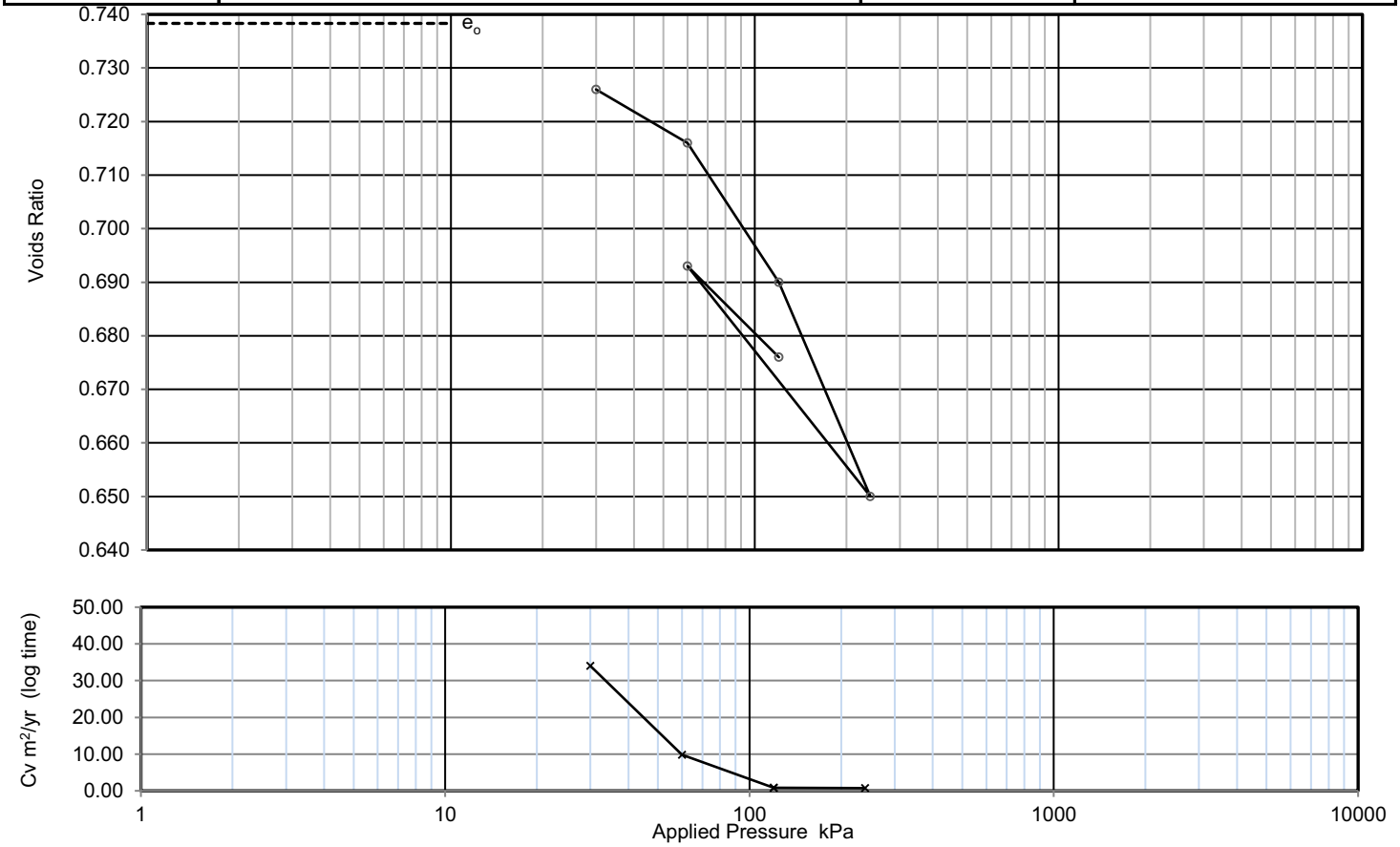
Date Reported: 16/05/2017

for and on behalf of i2 Analytical Ltd

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The analysis was carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland.

ONE DIMENSIONAL CONSOLIDATION TEST

				Job Ref	21612
				Borehole/Pit No.	BHRT002
Site Name	Rail Central			Sample No.	-
Project ID	C151171	Client	Hydrock	Depth	1.50
Soil Description	Grey silty CLAY with occasional fine gravel size weakly cemented siltstone nodules and scattered selenite crystals deposits			Sample Type	UT
				Sample Received	15/09/2016
				Schedule received	21/09/2016
				Project Started	21/09/2016
Test Method	BS1377:Part 5:1990, clause 3			Date Test started	26/10/2016



Applied Pressure kPa	Voids ratio	Mv m2/MN	Cv (t50, log) m2/yr	Cv (t90, root) m2/yr	Csec
2.0	0.738	-	-	-	-
30	0.726	0.26	34	26	0.0011
60	0.716	0.19	9.8	11	0.00053
120	0.690	0.25	0.83	3.1	0.0011
240	0.650	0.2	0.73	1.1	0.0018
60	0.693	0.15			
120	0.676	0.17	0.79	1.4	0.00068

Preparation

Orientation wthin sample: Vertical

Particle density: assumed 2.70 Mg/m3

Specimen details	Initial	Final	
Diameter	74.78	-	mm
Height	18.90	18.22	mm
Moisture Content	27.2	27.6	%
Bulk density	1.98	2.06	Mg/m3
Dry density	1.55	1.61	Mg/m3
Voids Ratio	0.738	0.676	
Saturation	99	110	%
Average temperature for test	22.0		oC
Swelling Pressure			kPa
Settlement on saturation			%

Remarks

Test Report by K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU
Tel: 01923 711 288
Email: James@k4soils.com

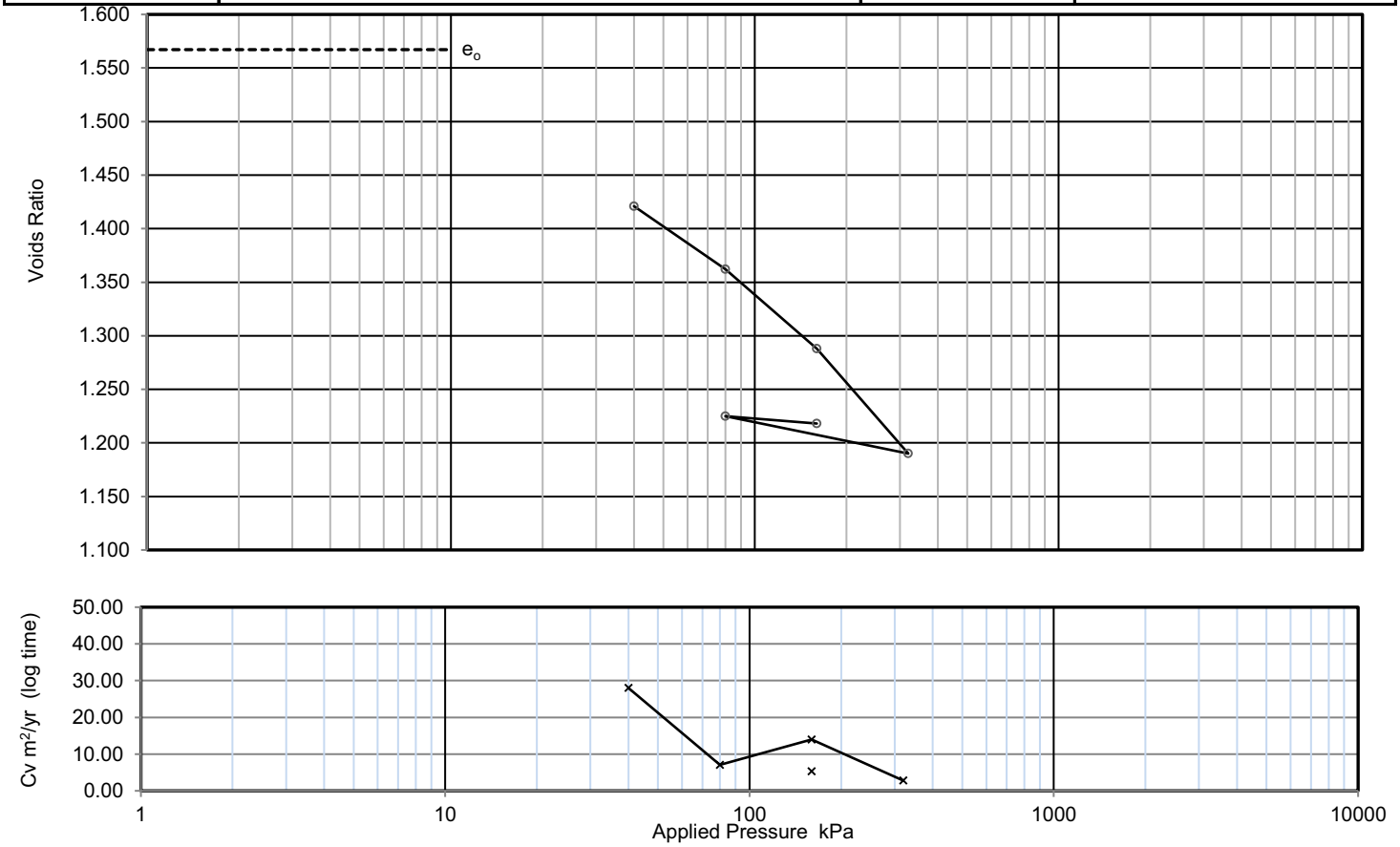
Checked and Approved

Initials kp

Date: 14/11/2016

ONE DIMENSIONAL CONSOLIDATION TEST

				Job Ref	21612
				Borehole/Pit No.	BHG025
Site Name	Rail Central			Sample No.	-
Project ID	C151171	Client	Hydrock	Depth	2.00
Soil Description	Dark brown and occasional bluish grey clayey gravelly SAND (gravel is fmc and angular to sub-angular)			Sample Type	U
				Sample Received	15/09/2016
				Schedule received	21/09/2016
				Project Started	21/09/2016
Test Method	BS1377:Part 5:1990, clause 3			Date Test started	25/10/2016



Applied Pressure kPa	Voids ratio	Mv m2/MN	Cv (t50, log) m2/yr	Cv (t90, root) m2/yr	Csec
2.0	1.567	-	-	-	-
40	1.421	1.5	28	28	0.0018
80	1.362	0.61	7.1	7.2	0.003
160	1.288	0.39	14	14	0.0035
320	1.190	0.27	2.8	6.6	0.0063
80	1.225	0.068			
160	1.218	0.044	5.3	5.8	0.00044

Preparation

Orientation wthin sample: Vertical

Particle density: assumed 2.70 Mg/m3

Specimen details	Initial	Final	
Diameter	74.91	-	mm
Height	19.80	17.10	mm
Moisture Content	62.4	51.1	%
Bulk density	1.71	1.84	Mg/m3
Dry density	1.05	1.22	Mg/m3
Voids Ratio	1.567	1.218	
Saturation	108	113	%
Average temperature for test	22.0		oC
Swelling Pressure			kPa
Settlement on saturation			%

Remarks

Test Report by K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU
Tel: 01923 711 288
Email: James@k4soils.com

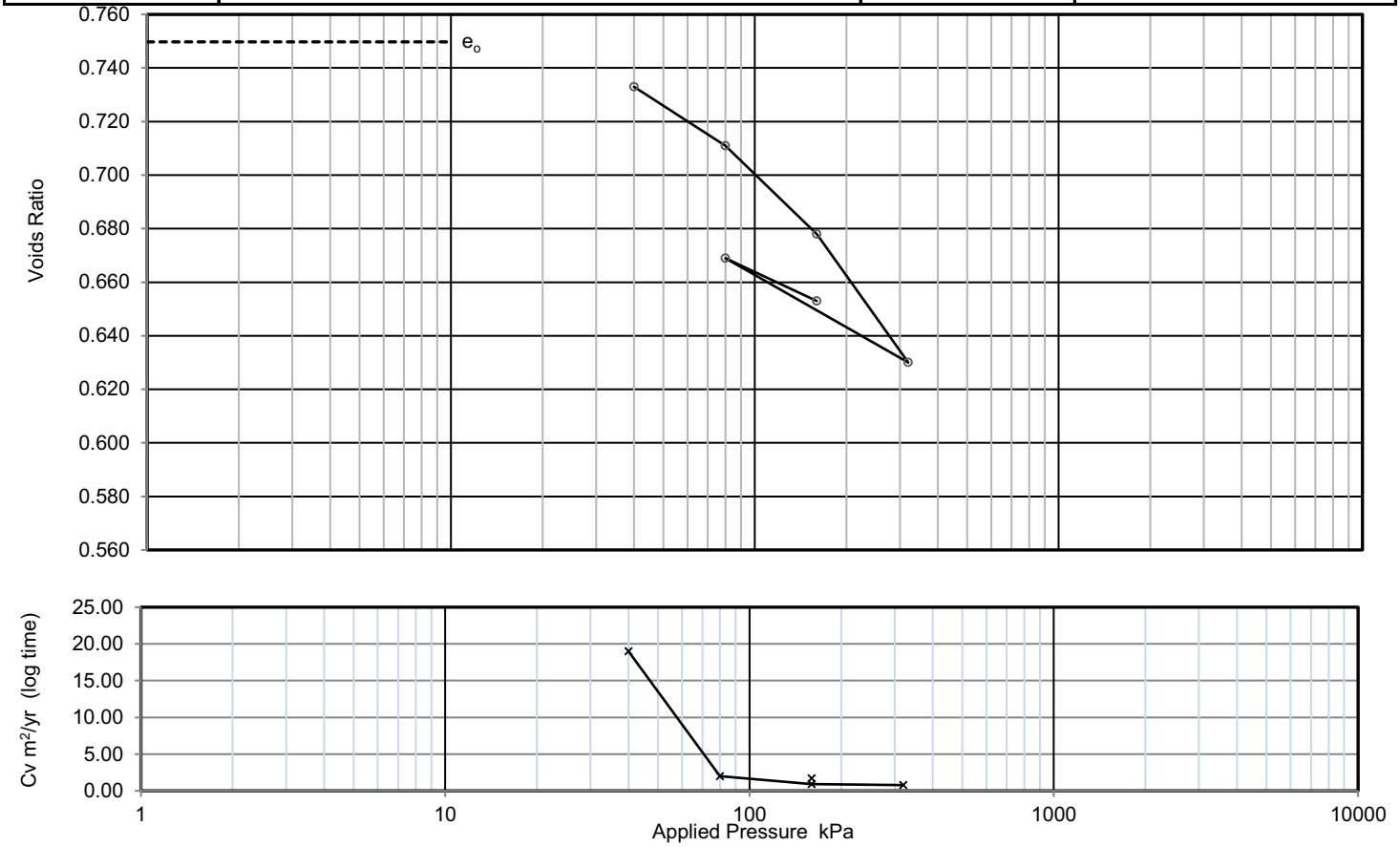
Checked and Approved

Initials kp

Date: 14/11/2016

ONE DIMENSIONAL CONSOLIDATION TEST

				Job Ref	21612
				Borehole/Pit No.	BHA013
Site Name	Rail Central			Sample No.	-
Project ID	C151171	Client	Hydrock	Depth	2.00
Soil Description	Grey silty CLAY with frequent pockets of orange silt and scattered selenite crystals			Sample Type	U
				Sample Received	15/09/2016
				Schedule received	21/09/2016
				Project Started	21/09/2016
Test Method	BS1377:Part 5:1990, clause 3			Date Test started	26/10/2016



Applied Pressure kPa	Voids ratio	Mv m2/MN	Cv (t50, log) m2/yr	Cv (t90, root) m2/yr	Csec
2.0	0.750	-	-	-	-
40	0.733	0.26	19	18	0.00053
80	0.711	0.31	2	4	0.00091
160	0.678	0.24	0.93	2.9	0.0018
320	0.630	0.18	0.78	0.73	0.0039
80	0.669	0.1			
160	0.653	0.12	1.7	1.6	0.00023

Preparation

Orientation wthin sample: Vertical

Particle density: assumed 2.70 Mg/m3

Specimen details	Initial	Final	
Diameter	74.96	-	mm
Height	19.98	18.88	mm
Moisture Content	27.9	27.0	%
Bulk density	1.97	2.07	Mg/m3
Dry density	1.54	1.63	Mg/m3
Voids Ratio	0.750	0.653	
Saturation	101	112	%
Average temperature for test	22.0		oC
Swelling Pressure			kPa
Settlement on saturation			%

Remarks

Test Report by K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU
Tel: 01923 711 288
Email: James@k4soils.com

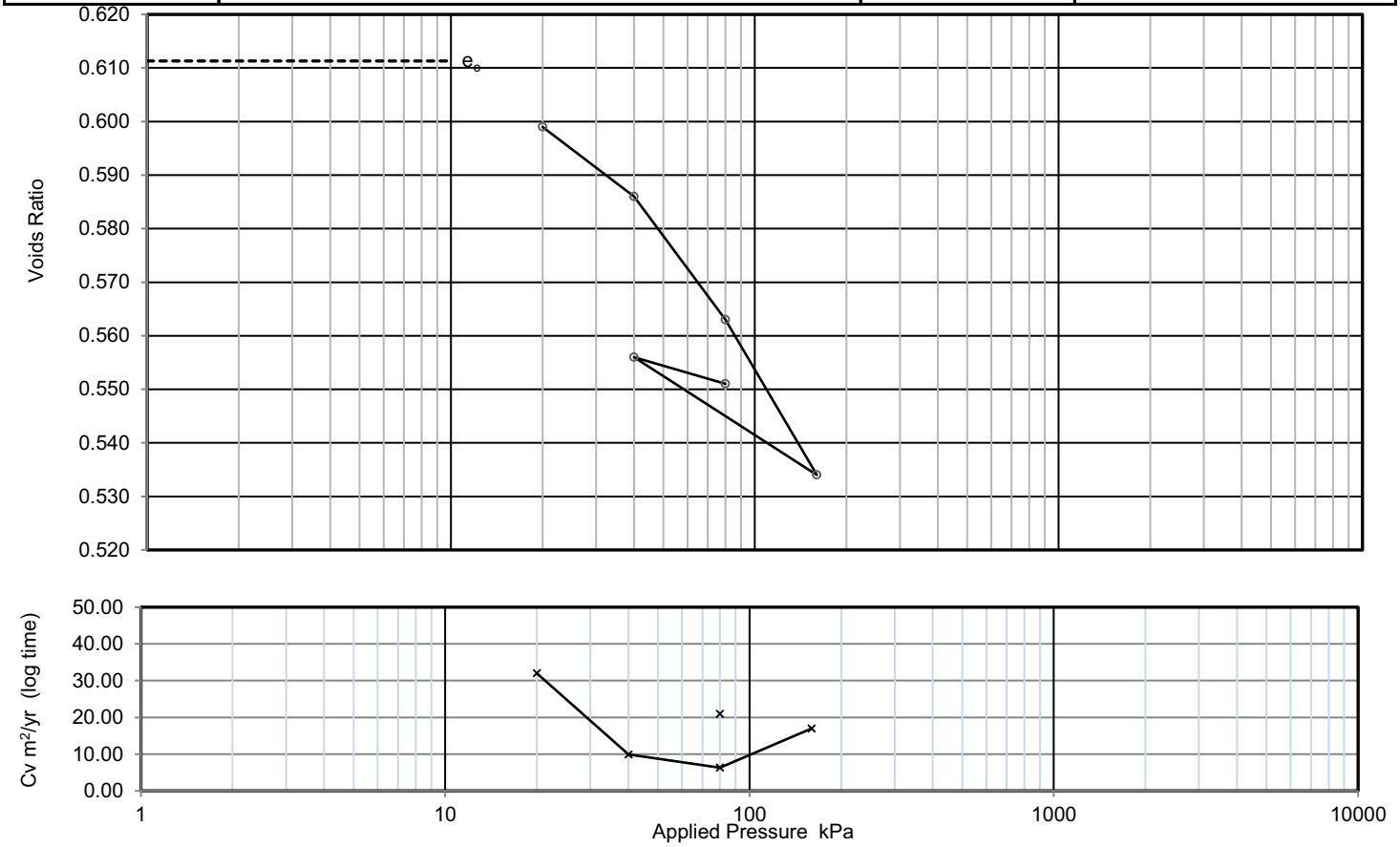
Checked and Approved

Initials kp

Date: 14/11/2016

ONE DIMENSIONAL CONSOLIDATION TEST

				Job Ref	21612
				Borehole/Pit No.	BHA012
Site Name	Rail Central			Sample No.	-
Project ID	C151171	Client	Hydrock	Depth	2.00
Soil Description	Grey sandy silty CLAY			Sample Type	U
				Sample Received	15/09/2016
				Schedule received	21/09/2016
				Project Started	21/09/2016
Test Method	BS1377:Part 5:1990, clause 3			Date Test started	25/10/2016



Applied Pressure kPa	Voids ratio	Mv m2/MN	Cv (t50, log) m2/yr	Cv (t90, root) m2/yr	Csec
2.0	0.611	-	-	-	-
20	0.599	0.43	32	30	0.00035
40	0.586	0.4	9.9	8.4	0.00027
80	0.563	0.37	6.3	8	0.00053
160	0.534	0.23	17	15	0.0012
40	0.556	0.12			
80	0.551	0.14	21	17	0.00035

Preparation

Orientation wthin sample: Vertical

Particle density: assumed 2.65 Mg/m3

Specimen details	Initial	Final	
Diameter	75.00	-	mm
Height	18.93	18.22	mm
Moisture Content	22.1	23.9	%
Bulk density	2.01	2.12	Mg/m3
Dry density	1.64	1.71	Mg/m3
Voids Ratio	0.611	0.551	
Saturation	96	115	%
Average temperature for test	22.0		oC
Swelling Pressure			kPa
Settlement on saturation			%

Remarks

Test Report by K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU
Tel: 01923 711 288
Email: James@k4soils.com

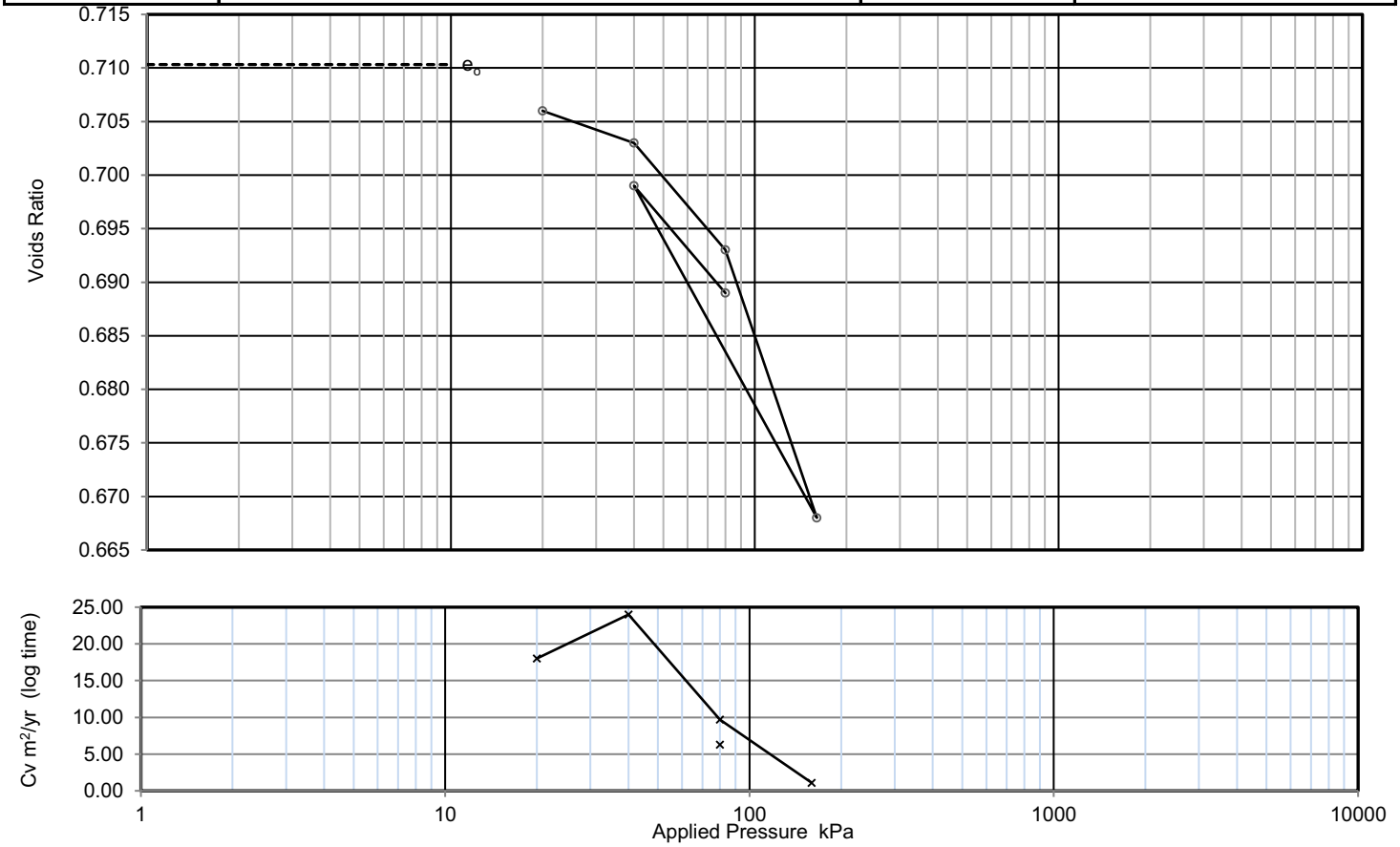
Checked and Approved

Initials kp

Date: 14/11/2016

ONE DIMENSIONAL CONSOLIDATION TEST

				Job Ref	21612
				Borehole/Pit No.	BHA004
Site Name	Rail Central			Sample No.	-
Project ID	C151171	Client	Hydrock	Depth	1.20
Soil Description	Orangish brown mottled grey silty CLAY			Sample Type	UT
				Sample Received	15/09/2016
				Schedule received	21/09/2016
				Project Started	21/09/2016
Test Method	BS1377:Part 5:1990, clause 3			Date Test started	26/10/2016



Applied Pressure kPa	Voids ratio	Mv m2/MN	Cv (t50, log) m2/yr	Cv (t90, root) m2/yr	Csec
2.0	0.710	-	-	-	-
20	0.706	0.15	18	25	0.00018
40	0.703	0.09	24	25	0.00053
80	0.693	0.15	9.7	14	-2.15E+09
160	0.668	0.18	1.1	2.1	0.00091
40	0.699	0.15			
80	0.689	0.15	6.3	6.4	0.00083

Preparation

Orientation wthin sample: Vertical

Particle density: assumed 2.70 Mg/m3

Specimen details	Initial	Final	
Diameter	74.95	-	mm
Height	18.84	18.60	mm
Moisture Content	25.5	27.1	%
Bulk density	1.98	2.03	Mg/m3
Dry density	1.58	1.60	Mg/m3
Voids Ratio	0.710	0.689	
Saturation	97	106	%
Average temperature for test	22.0		oC
Swelling Pressure			kPa
Settlement on saturation			%

Remarks

Test Report by K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU
Tel: 01923 711 288
Email: James@k4soils.com

Checked and Approved

Initials kp

Date: 14/11/2016

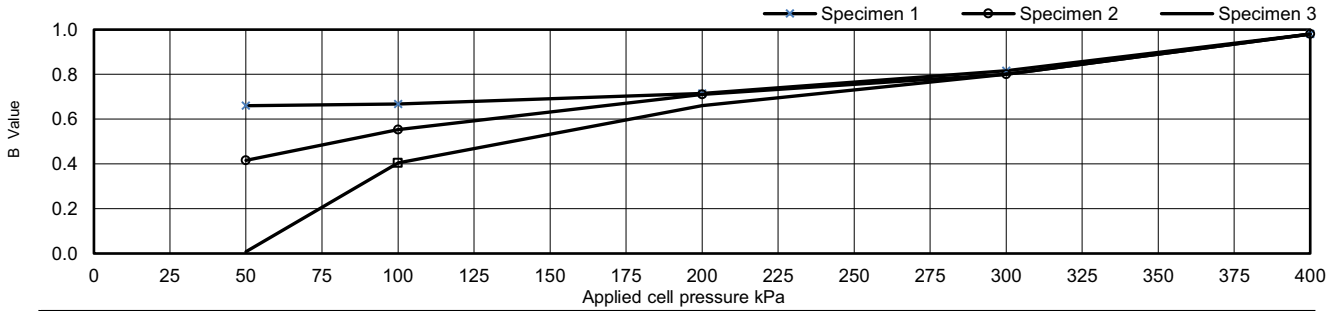
2519 Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

	Consolidated Undrained Triaxial Compression Test with measurement of pore pressure			Job Ref	21612
				Borehole/Pit No.	BHA012
Site Name	Rail Central			Sample No.	-
Project ID	C151171	Client	Hydrock	Depth m	2.00
Soil Description	Grey sandy silty CLAY			Sample Type	U
				Samples received	15/09/2016
				Schedule received	21/09/2016
Test Method	BS1377 : Part 8 : 1990, clauses 1 to 7			Date started	20/09/2016

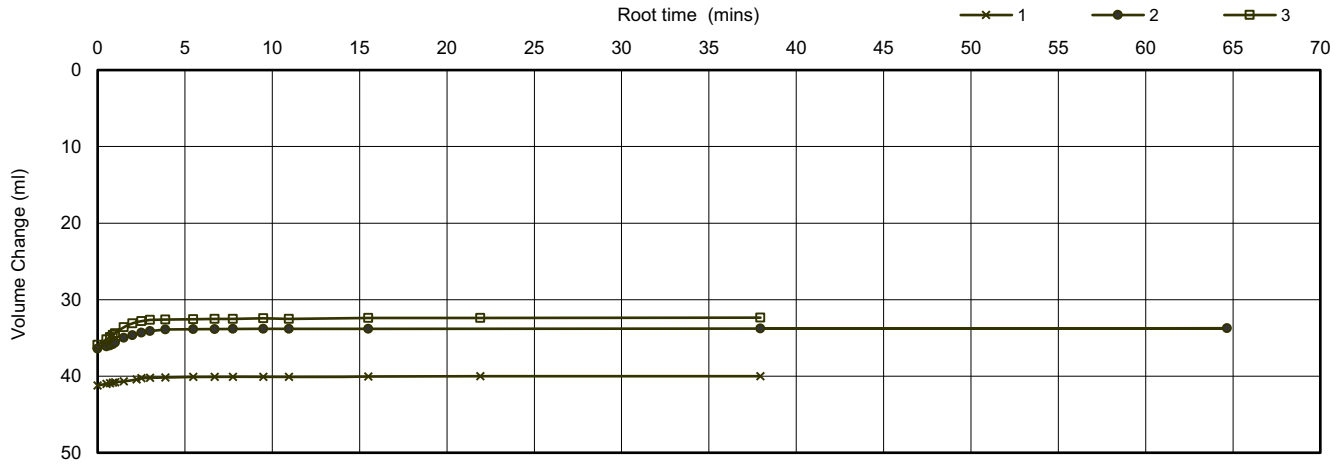
Specimen Type/Preparation	Undisturbed As BS 1377

Specimen Details			1	2	3
Initial	Height	mm	76.0	76.0	76.0
	Diameter	mm	38.0	38.0	38.0
	Bulk Density	Mg/m³	2.01	2.03	1.99
	Water Content	%	23.4	21.8	20.8
	Dry density	Mg/m³	1.63	1.67	1.65
Final	Bulk Density	Mg/m³	2.01	2.01	2.01
	Water Content	%	24.2	23.2	22.2
	Dry density	Mg/m³	1.62	1.62	1.62

Saturation Details		1	2	3
Method		Increments of cell and back pressure	Increments of cell and back pressure	Increments of cell and back pressure
Cell pressure increments	kPa	100	100	100
Differential Pressure	kPa	10	10	10
Final Cell Pressure	kPa	400	400	400
Final pore water pressure	kPa	290	290	290
Final B Value		0.98	0.98	0.98



Consolidation Details	Specimen No.		1	2	3	
	Drainage Conditions		Radial+1 end	Radial+1 end	Radial+1 end	
	Cell Pressure applied		340	380	460	kPa
	Back Pressure applied		300	300	300	kPa
	Effective Pressure		40	80	160	kPa
	Pore pressure at start of consolidation		331	374	457	kPa
	Pore pressure at end of consolidation		298	298	299	kPa
	Pore pressure dissipation at end of consolidation		108	102	101	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	Cvi	0.46	0.39	0.45	m2/year
	Coefficient of Compressibility	Mvi	9.08	3.56	1.71	m2/MN
	Coefficient of Permeability (calculated)	kvi	1.3E-09	4.4E-10	2.4E-10	m/s



Test Report by K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU

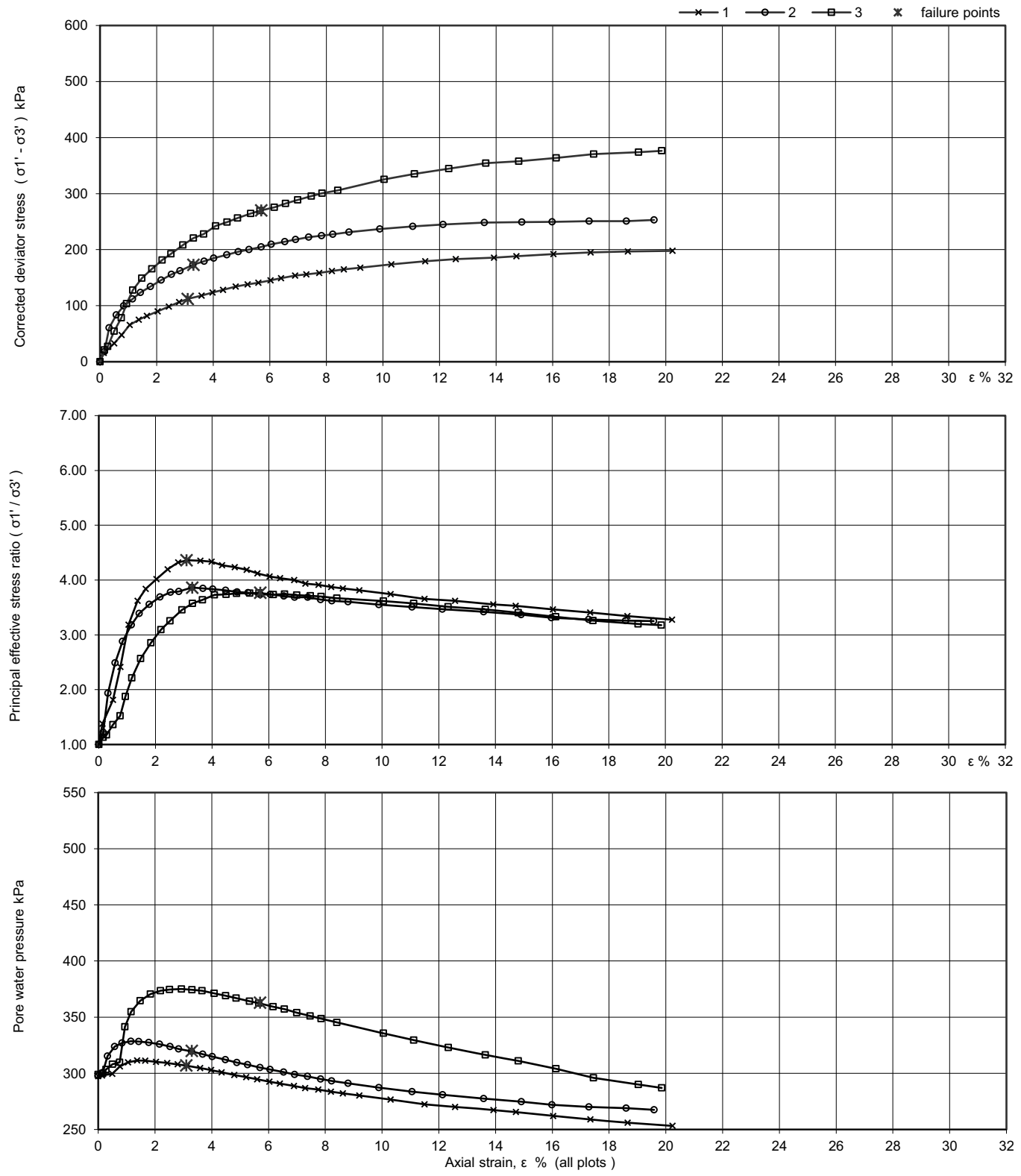
Tel: 01923 711 288
Email: James@k4soils.com

Checked and Aproved

Initials **kp**

Date 27/10/2016

	Consolidated Undrained Triaxial Compression Test with measurement of pore pressure			Job Ref	21612
				Borehole/Pit No.	BHA012
Site Name	Rail Central			Sample No.	-
Project ID	C151171	Client	Hydrock	Depth m	2.00
Compression stages - graphical data				Sample Type	U
				Schedule received	21/09/2016
				Date started	29/09/2016



Test Report by K4 SOILS LABORATORY
Unit 8 Olds Close Olds Approach
Watford Herts WD18 9RU

Tel: 01923 711 288
Email: James@k4soils.com

Checked and Aproved

Initials **kp**

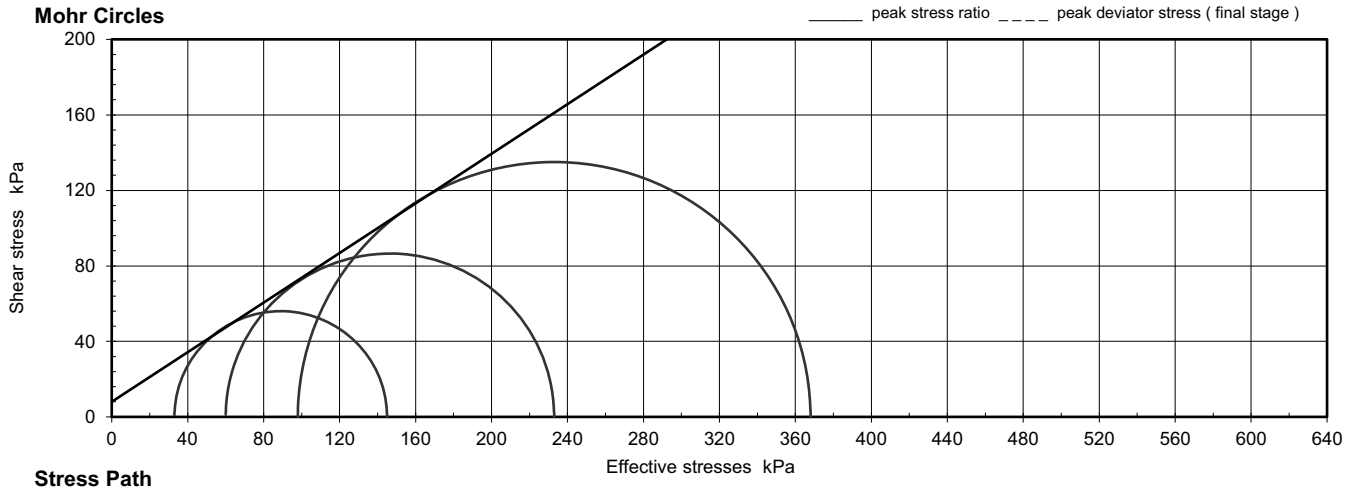
Date 27/10/2016

	Consolidated Undrained Triaxial Compression Test with measurement of pore pressure			Job Ref	21612
				Borehole/Pit No.	BHA012
Site Name	Rail Central			Sample No.	-
Project ID	C151171	Client	Hydrock	Depth m	2.00
Compression stages - table of results and interpretation				Sample Type	U
				Schedule received	21/09/2016
				Date started	29/09/2016

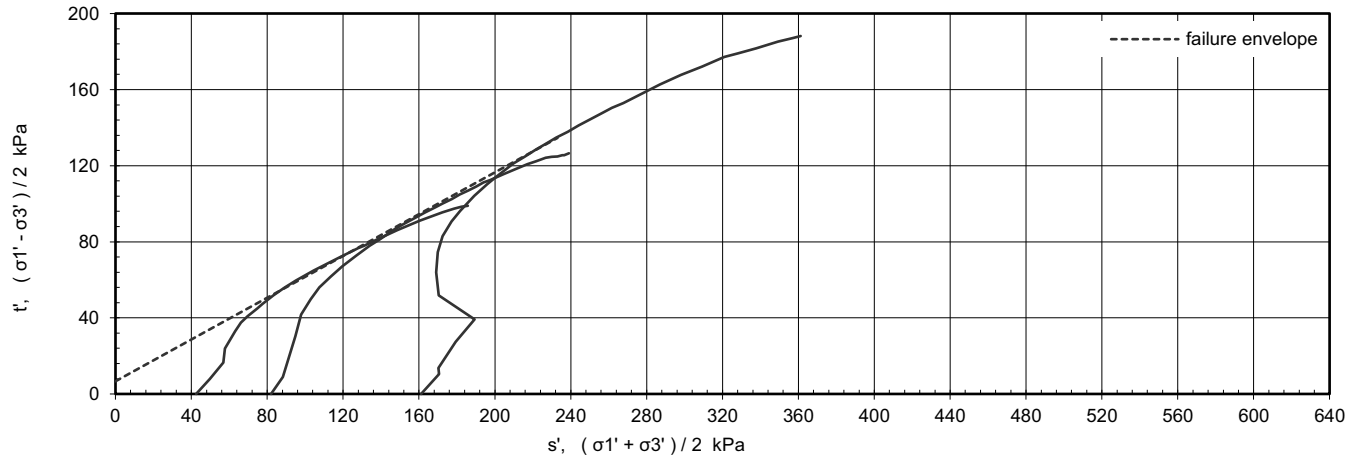
Failure criterion : Maximum effective principal stress ratio

Specimen	Cell pressure kPa	Initial pwp kPa	Initial σ3' kPa	Rate of strain %/hr	Axial strain, εf %	(σ1' / σ3') f	(σ1' - σ3') f kPa	uf kPa	σ3' f kPa	σ1' f kPa	Af
1	340	300	40	0.90	3.1	4.36	112	307	33	146	0.08
2	380	300	80	1.05	3.3	3.86	173	320	60	233	0.12
3	460	300	160	9.03	5.7	3.77	270	363	98	367	0.24

Mohr Circles

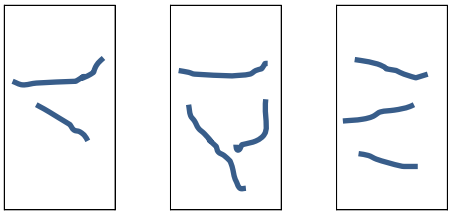


Stress Path



Shear Strength Parameters			Linear regression	Manual re-assessment
At Maximum effective principal :	c '	kPa	8	-
	Ø '	degrees	33.3	-

Mode of failure



Remarks

General Deviator stresses corrected for area change, vertical side drains and up to 0.3 mm thick rubber membrane/

Test Report by K4 SOILS LABORATORY
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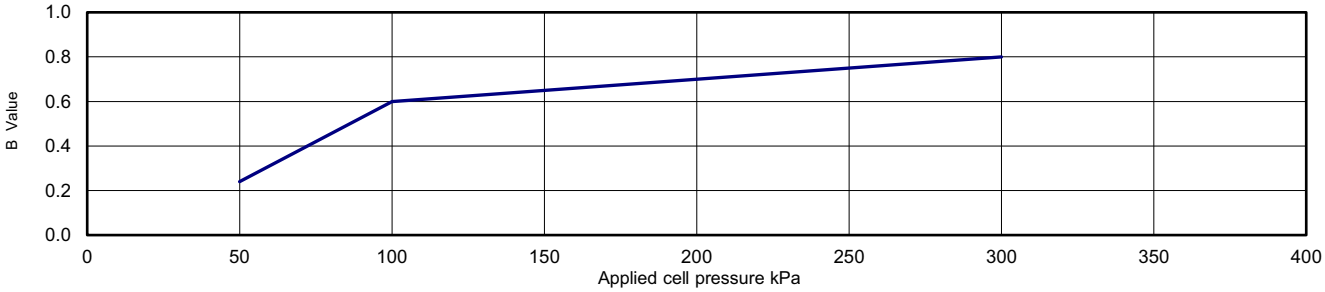
Checked and Aproved
Initials kp
Date 27/10/2016

	Consolidated Undrained Triaxial Compression Test with measurement of pore pressure (Multistage test on a single specimen)			Job Ref	21612
				Borehole/Pit No.	BHG012
Site Name	Rail Central			Sample No.	-
Project ID	C151171	Client	Hydrock	Depth m	1.50
Soil Description	Brown friable CLAY with mudstone fragments			Sample Type	U
				Date Scheduled	15/09/2016
Test Method	Multistage test based on BS1377 : Part 8 : 1990, clauses 1 to 6 and 7			Date Started	21/09/2016

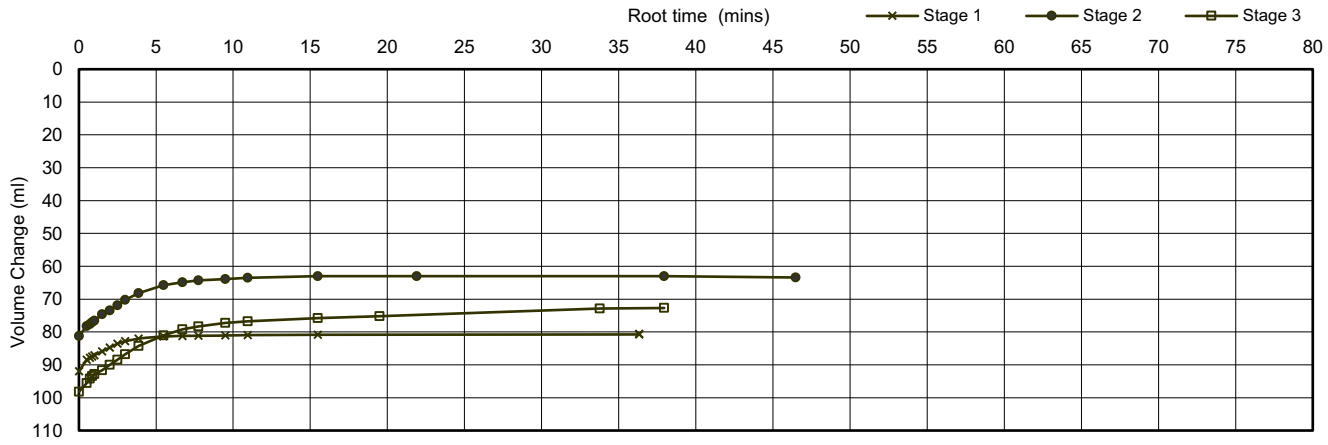
Specimen Type/Preparation	UNDISTURBED As BS 1377

Specimen Details		Initial	Final
Height	mm	199.0	
Diameter	mm	102.0	
Bulk Density	Mg/m³	1.85	1.85
Water Content	%	38.3	36.6
Dry density	Mg/m³	1.34	1.35

Saturation Details	Method of Saturation	
	Increments of cell and back pressure	
Cell pressure increments		kPa
Differential Pressure		kPa
Final Cell Pressure	400	kPa
Final pore water pressure	290	kPa
Final B Value	0.98	



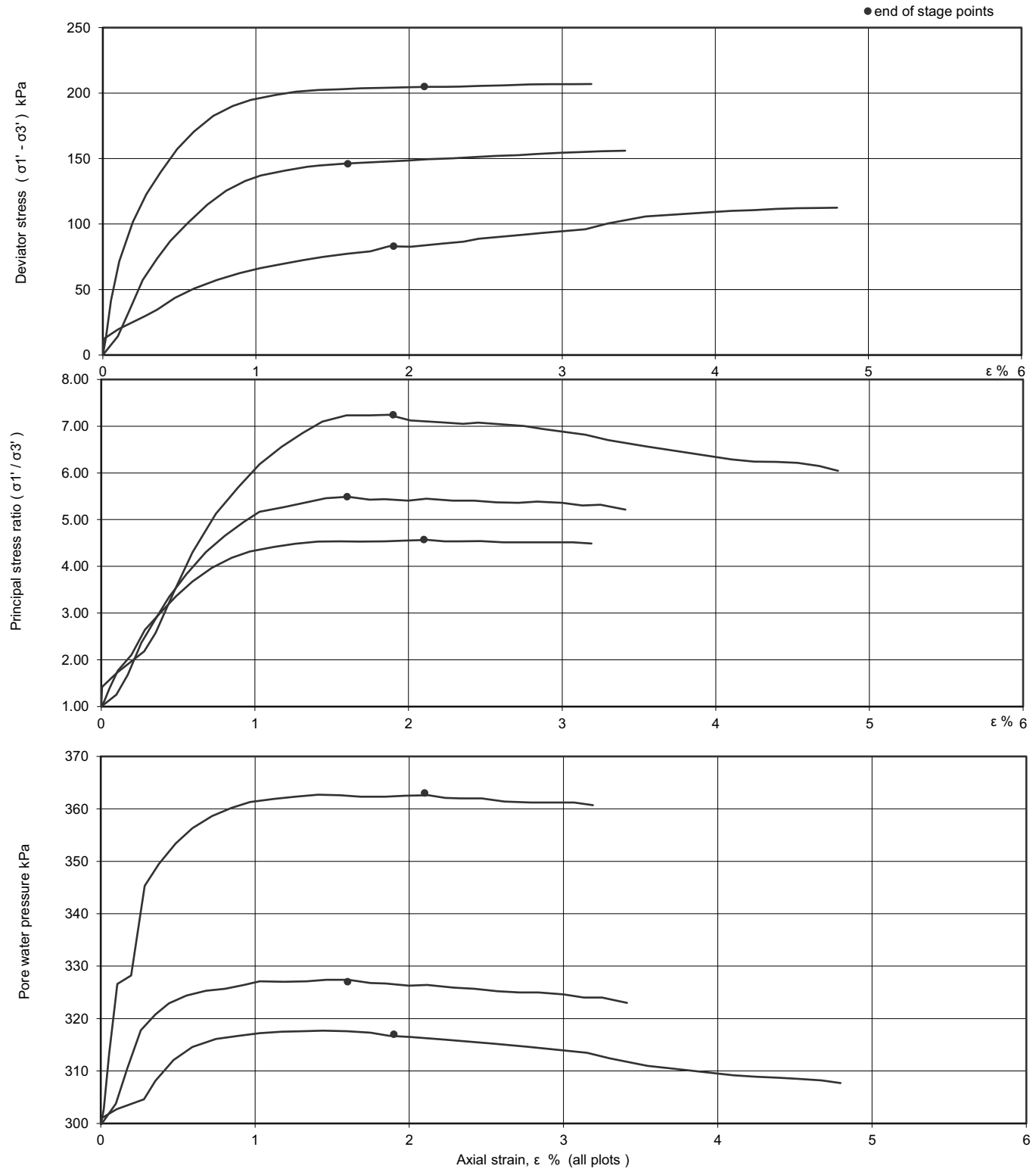
	Drainage Conditions		from one end and radial boundary			
Consolidation Details	Stage No.		1	2	3	
	Cell Pressure applied		330	360	420	kPa
	Back Pressure applied		300	300	300	kPa
	Effective Pressure		30	60	120	kPa
	Pore pressure at start of consolidation		327	344	388	kPa
	Pore pressure at end of consolidation		299	300	299	kPa
	Pore pressure dissipation at end of consolidation		106	101	101	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	Cvi	1.59	1.62	1.58	m2/year
	Coefficient of Compressibility	Mvi	1.560	0.856	0.484	m2/MN
	Coefficient of Permeability (calculated)	kvi	7.7E-10	4.3E-10	2.4E-10	m/s



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Initials **kp**
Date 01/11/2016

	Consolidated Undrained Triaxial Compression Test with measurement of pore pressure (Multistage test on a single specimen)			Job Ref	21612
				Borehole/Pit No.	BHG012
Site Name	Rail Central			Sample No.	-
Project ID	C151171	Client	Hydrock	Depth m	1.50
Compression stages - graphical data				Sample Type	U
				Date Started	21/09/2016



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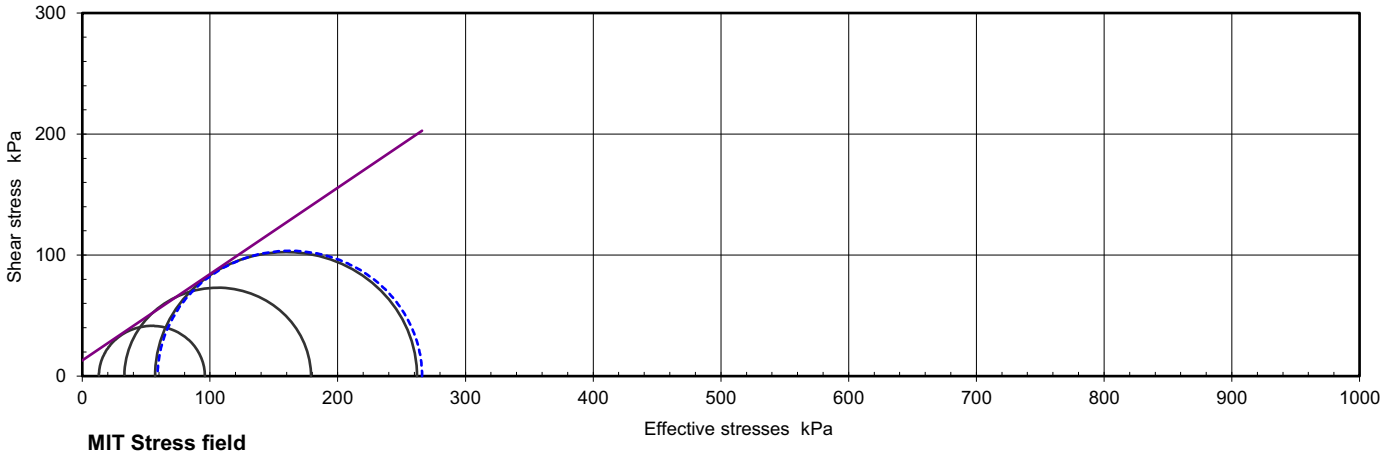
	Consolidated Undrained Triaxial Compression Test with measurement of pore pressure (Multistage test on a single specimen)			Job Ref	21612
				Borehole/Pit No.	BHG012
Site Name	Rail Central			Sample No.	-
Project ID	C151171	Client	Hydrock	Depth m	1.50
Compression stages - table of results and interpretation				Sample Type	U
				Date Started	21/09/2016

End of stage criterion : Maximum effective principal stress ratio

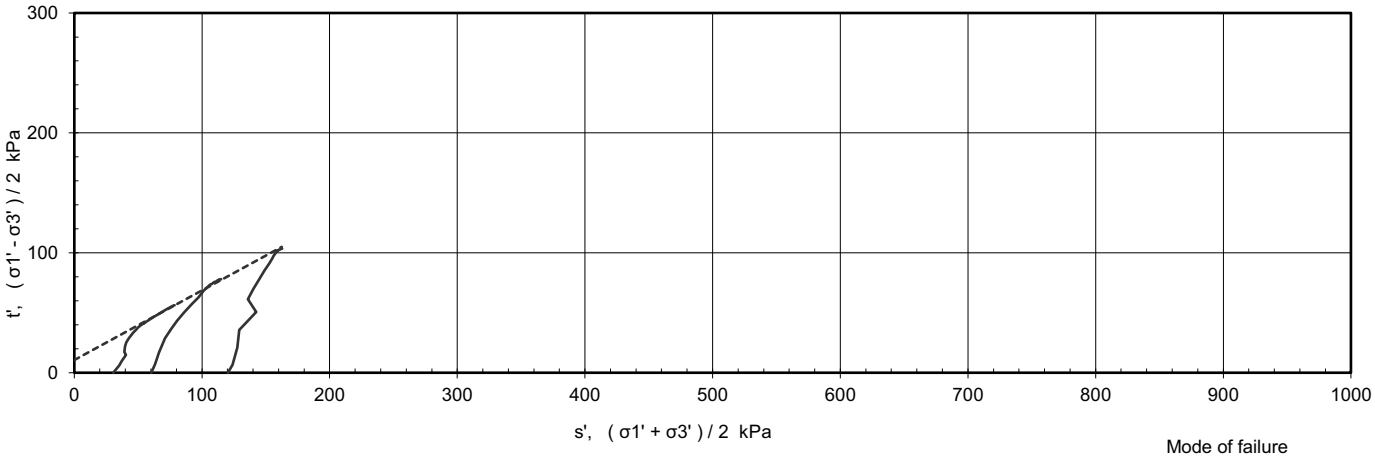
Stage	Cell pressure kPa	Initial pwp kPa	Initial σ3' kPa	Rate of strain %/hr	Axial strain, εf %	(σ1' / σ3') f	(σ1' - σ3') f kPa	uf kPa	σ3' f kPa	σ1' f kPa	Af
1	330	300	30	1.64	1.9	7.24	83	317	13	96	0.20
2	360	300	60	1.65	1.6	5.49	146	327	33	179	0.19
3	420	300	120	1.65	2.1	4.57	205	363	57	262	0.31
Conditions at Maximum Deviator Stress					3.2	4.49	207	361	59	266	0.29

Mohr Circles

_____ peak stress ratio _ _ _ _ peak deviator stress (final stage)

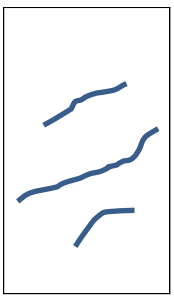


MIT Stress field



Shear Strength Parameters			Linear regression	Manual re-assessment
at peak stress ratio	c '	kPa	12.8	-
	Ø '	degrees	35.5	-

Mode of failure



Remarks

General	Deviator stresses corrected for area change, vertical side drains and 0.3 mm thick rubber membrane/
Stage 1	
Stage 2	
Stage 3	

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Date 01/11/2016

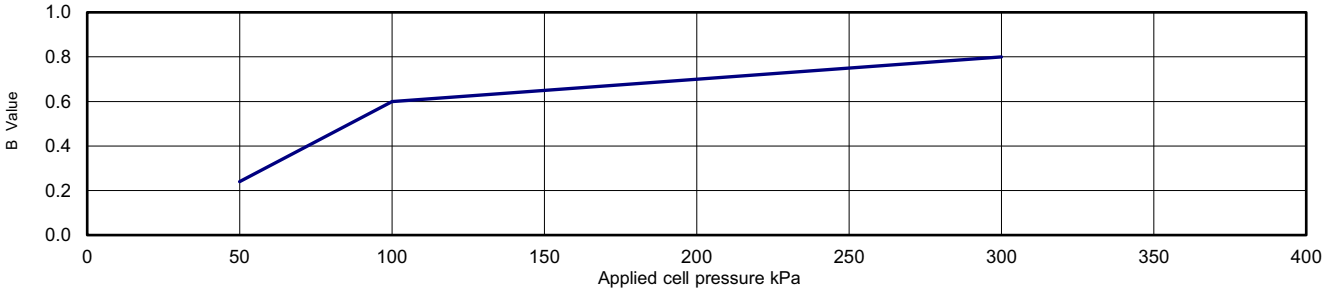
Consolidated Undrained Triaxial Compression Test with measurement of pore pressure (Multistage test on a single specimen)

				Job Ref	21612
				Borehole/Pit No.	BHG025
Site Name	Rail Central			Sample No.	-
Project ID	C151171	Client	Hydrock	Depth m	2.00
Soil Description	Dark brown and occasional bluish grey clayey gravelly SAND (gravel is fmc and angular to sub-angular)			Sample Type	U
				Date Scheduled	21/09/2016
Test Method	Multistage test based on BS1377 : Part 8 : 1990, clauses 1 to 6 and 7			Date Started	18/10/2016

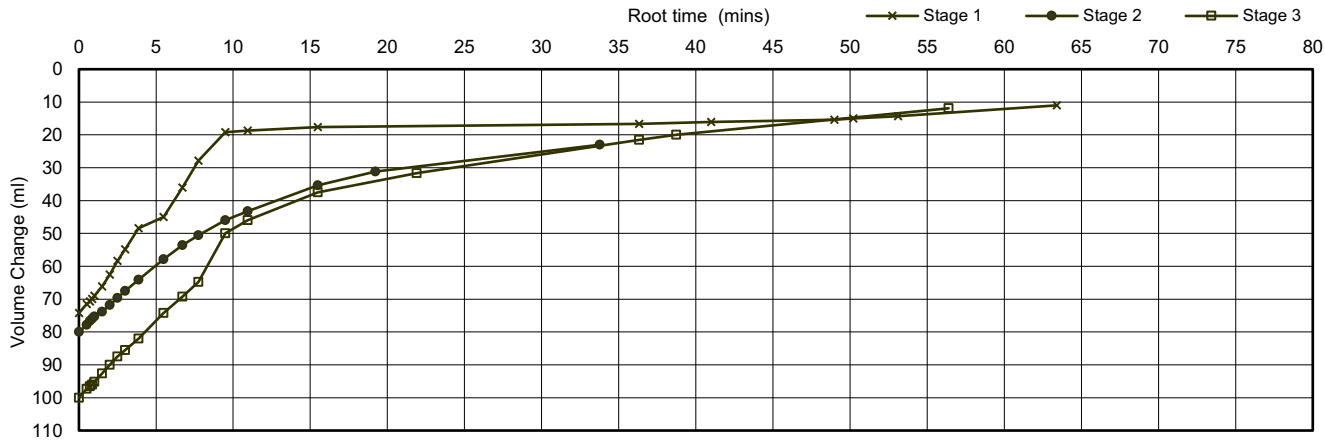
Specimen Type/Preparation	UNDISTURBED As BS 1377

Specimen Details		Initial	Final
Height	mm	208.0	
Diameter	mm	104.0	
Bulk Density	Mg/m³	1.68	1.88
Water Content	%	45.2	33.0
Dry density	Mg/m³	1.16	1.41

Saturation Details	Method of Saturation	
	Increments of cell and back pressure	
Cell pressure increments		kPa
Differential Pressure		kPa
Final Cell Pressure	400	kPa
Final pore water pressure	290	kPa
Final B Value	0.98	



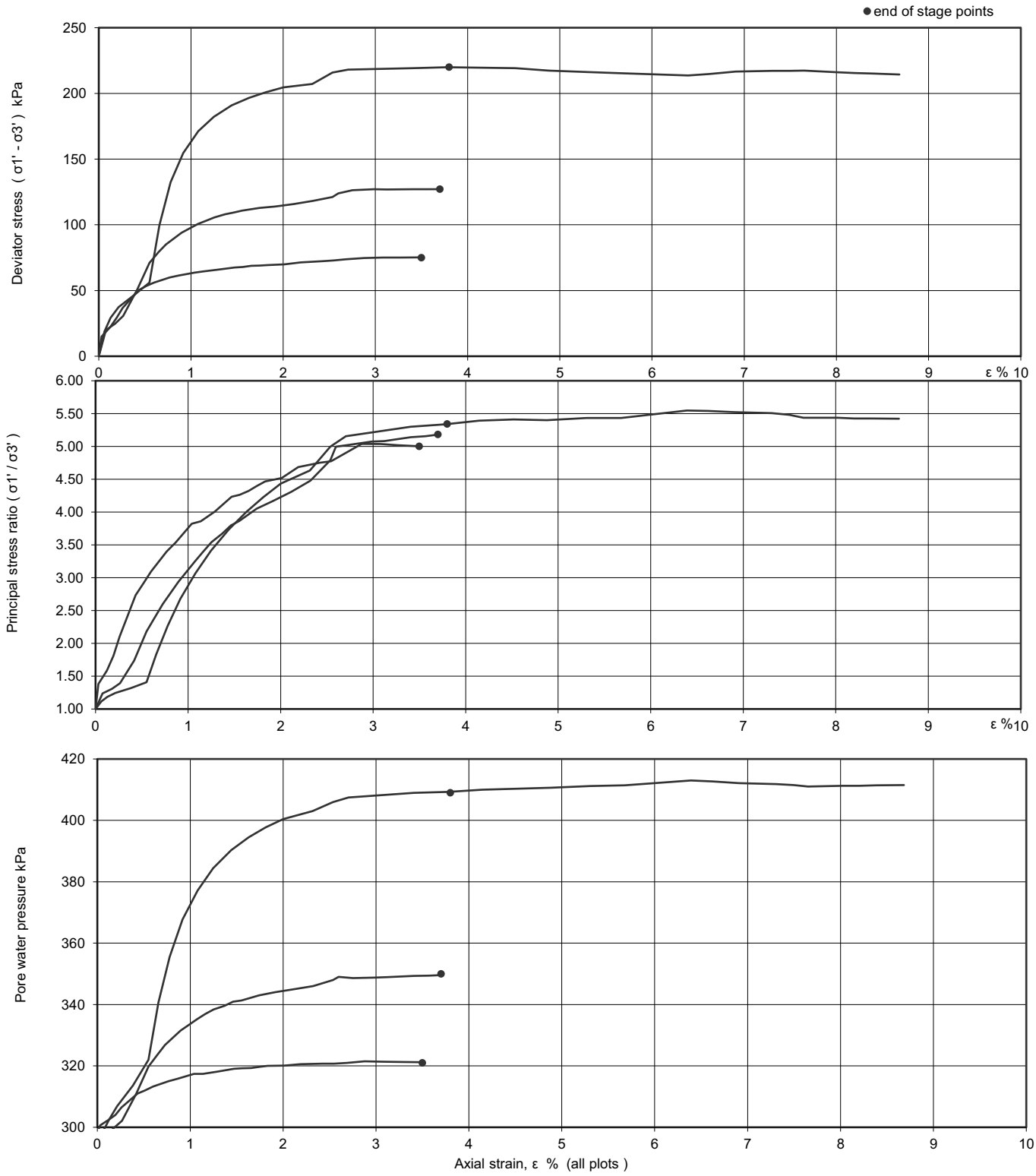
Consolidation Details	Drainage Conditions		from one end and radial boundary			
	Stage No.		1	2	3	
	Cell Pressure applied		340	380	460	kPa
	Back Pressure applied		300	300	300	kPa
	Effective Pressure		40	80	160	kPa
	Pore pressure at start of consolidation		336	359	428	kPa
	Pore pressure at end of consolidation		291	289	292	kPa
	Pore pressure dissipation at end of consolidation		124	119	107	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	Cvi	0.55	0.55	0.54	m2/year
	Coefficient of Compressibility	Mvi	0.164	0.226	0.060	m2/MN
	Coefficient of Permeability (calculated)	kvi	2.8E-11	3.8E-11	1.0E-11	m/s



Test Report by K4 SOILS LABORATORY
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Initials kp
Date 15/11/2016

	Consolidated Undrained Triaxial Compression Test with measurement of pore pressure (Multistage test on a single specimen)			Job Ref	21612
				Borehole/Pit No.	BHG025
Site Name	Rail Central			Sample No.	-
Project ID	C151171	Client	Hydrock	Depth m	2.00
Compression stages - graphical data				Sample Type	U
				Date Started	21/09/2016



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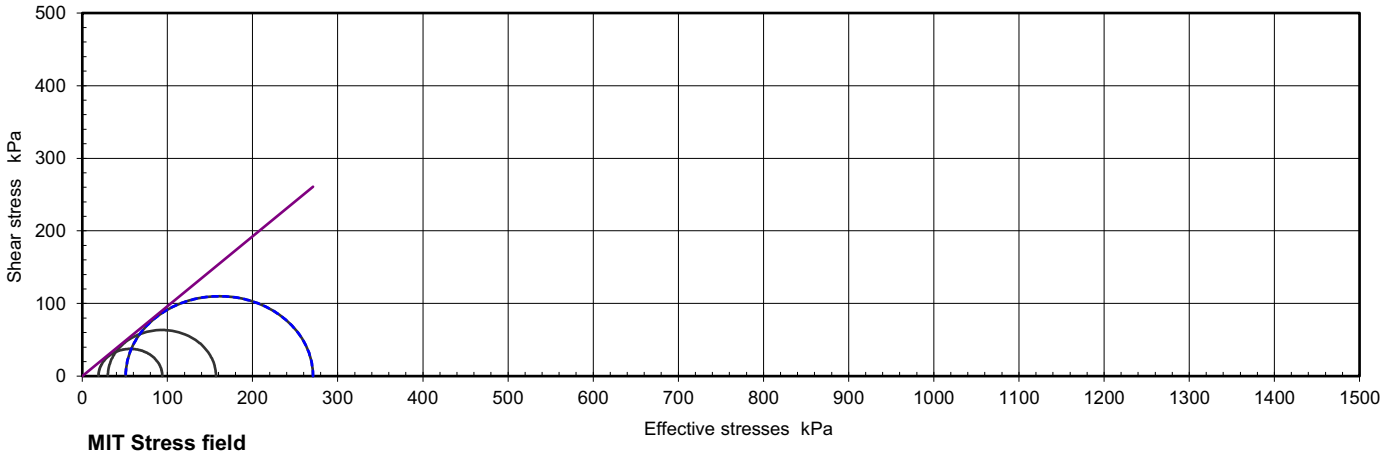
	Consolidated Undrained Triaxial Compression Test with measurement of pore pressure (Multistage test on a single specimen)			Job Ref	21612
				Borehole/Pit No.	BHG025
Site Name	Rail Central			Sample No.	-
Project ID	C151171	Client	Hydrock	Depth m	2.00
Compression stages - table of results and interpretation				Sample Type	U
				Date Started	21/09/2016

End of stage criterion : Maximum effective principal stress ratio

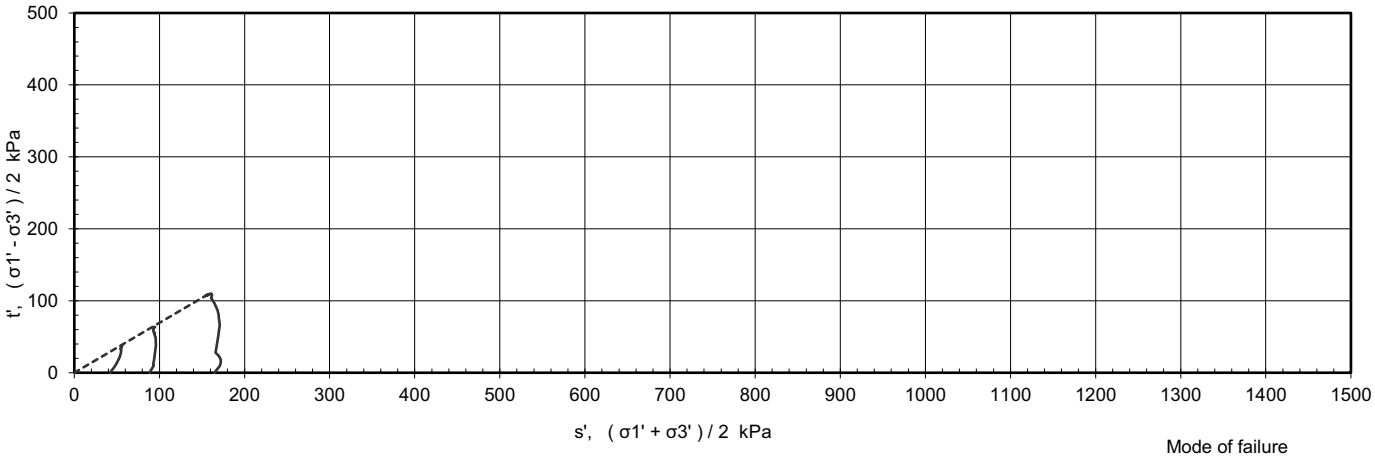
Stage	Cell pressure kPa	Initial pwp kPa	Initial σ3' kPa	Rate of strain %/hr	Axial strain, εf %	(σ1' / σ3') f	(σ1' - σ3') f kPa	uf kPa	σ3' f kPa	σ1' f kPa	Af
1	340	300	40	1.40	3.5	5.00	75	321	19	94	0.28
2	380	300	80	1.40	3.7	5.18	127	350	30	158	0.39
3	460	300	160	1.40	3.8	5.34	220	409	51	271	0.50
Conditions at Maximum Deviator Stress					3.8	5.34	220	409	51	271	0.50

Mohr Circles

_____ peak stress ratio _ _ _ _ peak deviator stress (final stage)

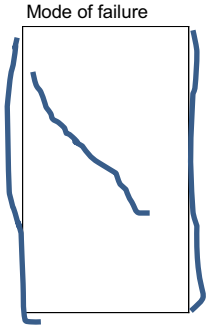


MIT Stress field



Shear Strength Parameters			Linear regression	Manual re-assessment
at peak stress ratio	c '	kPa	0.0	-
	Ø '	degrees	43.9	-

Mode of failure



Remarks

General	Deviator stresses corrected for area change, vertical side drains and 0.3 mm thick rubber membrane/
Stage 1	
Stage 2	
Stage 3	

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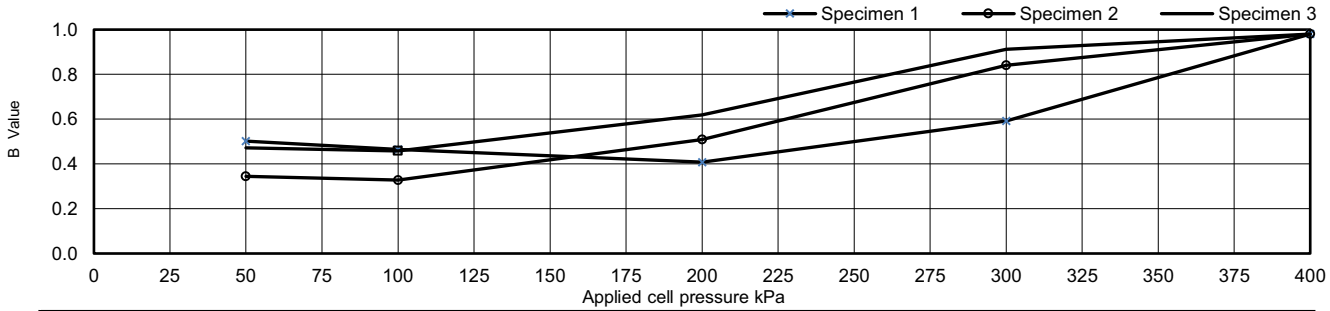
Checked and Aproved
Initials kp
Date 15/11/2016

	Consolidated Undrained Triaxial Compression Test with measurement of pore pressure			Job Ref	21612
				Borehole/Pit No.	BHL003
Site Name	Rail Central			Sample No.	-
Project ID	C151171	Client	Hydrock	Depth m	3.00
Soil Description	Grey silty CLAY with occasional light grey silt pockets			Sample Type	B
				Samples received	15/09/2016
				Schedule received	21/09/2016
Test Method	BS1377 : Part 8 : 1990, clauses 1 to 7			Date started	24/10/2016

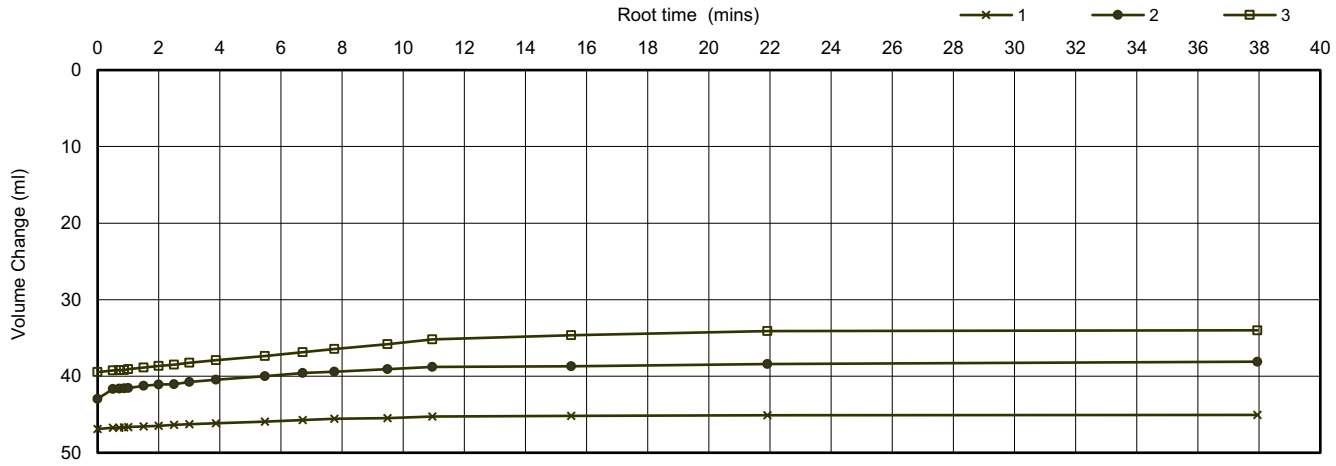
Specimen Type/Preparation	Undisturbed As BS 1377

Specimen Details			1	2	3
Initial	Height	mm	76.0	76.0	76.0
	Diameter	mm	38.0	38.0	38.0
	Bulk Density	Mg/m³	2.01	2.02	2.01
	Water Content	%	28.1	26.5	25.9
	Dry density	Mg/m³	1.57	1.60	1.60
Final	Bulk Density	Mg/m³	1.96	1.96	1.96
	Water Content	%	28.5	26.6	26.0
	Dry density	Mg/m³	1.53	1.53	1.53

Saturation Details		1	2	3
Method		Increments of cell and back pressure	Increments of cell and back pressure	Increments of cell and back pressure
Cell pressure increments	kPa	100	100	100
Differential Pressure	kPa	10	10	10
Final Cell Pressure	kPa	400	400	400
Final pore water pressure	kPa	290	290	290
Final B Value		0.98	0.98	0.98



	Specimen No.		1	2	3	
	Drainage Conditions		Radial+1 end	Radial+1 end	Radial+1 end	
Consolidation Details	Cell Pressure applied		360	420	540	kPa
	Back Pressure applied		300	300	300	kPa
	Effective Pressure		60	120	240	kPa
	Pore pressure at start of consolidation		347	408	532	kPa
	Pore pressure at end of consolidation		301	299	299	kPa
	Pore pressure dissipation at end of consolidation		97	101	100	%
Consolidation parameters (see note to BS1377 : pt 8, clause 6.3.4)	Coefficient of Consolidation	Cvi	0.21	0.19	0.20	m2/year
	Coefficient of Compressibility	Mvi	7.05	2.7	1.18	m2/MN
	Coefficient of Permeability (calculated)	kvi	4.7E-10	1.5E-10	7.3E-11	m/s



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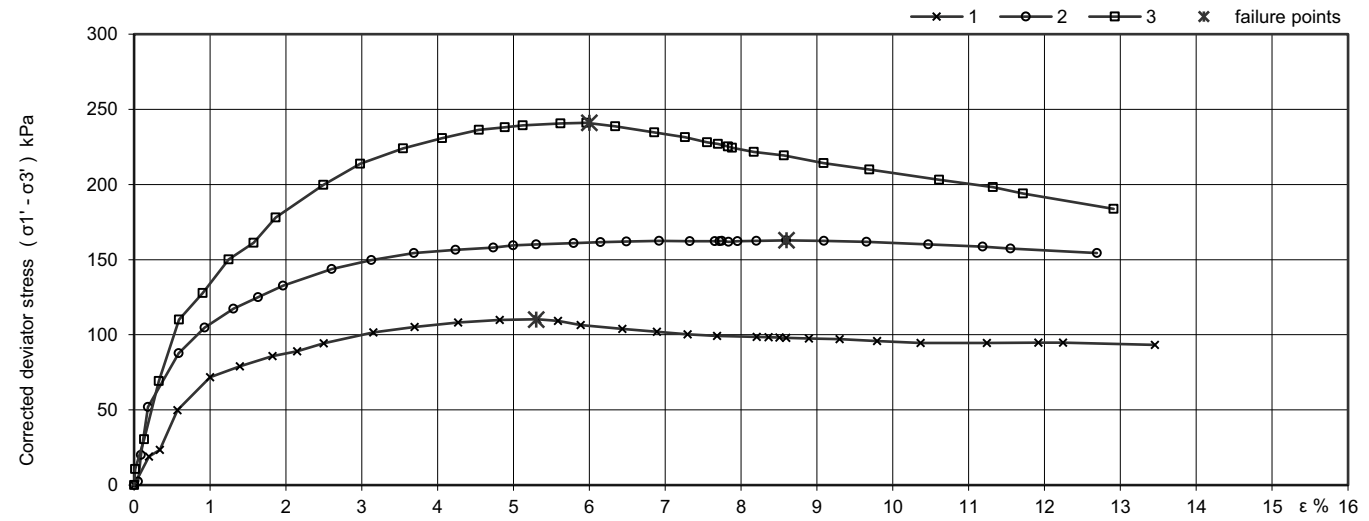
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Email: James@k4soils.com

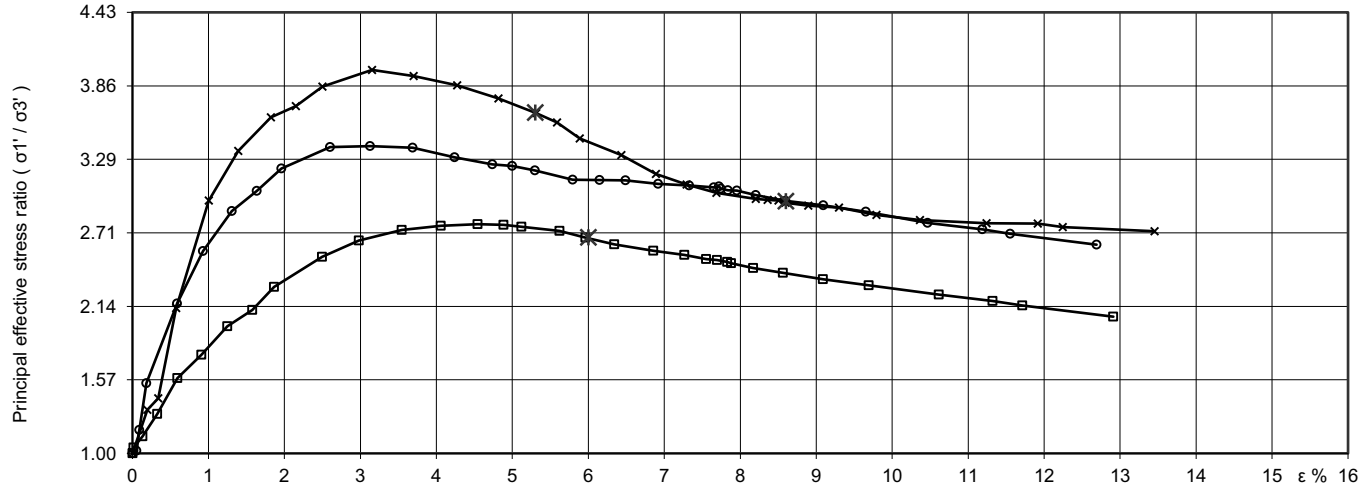
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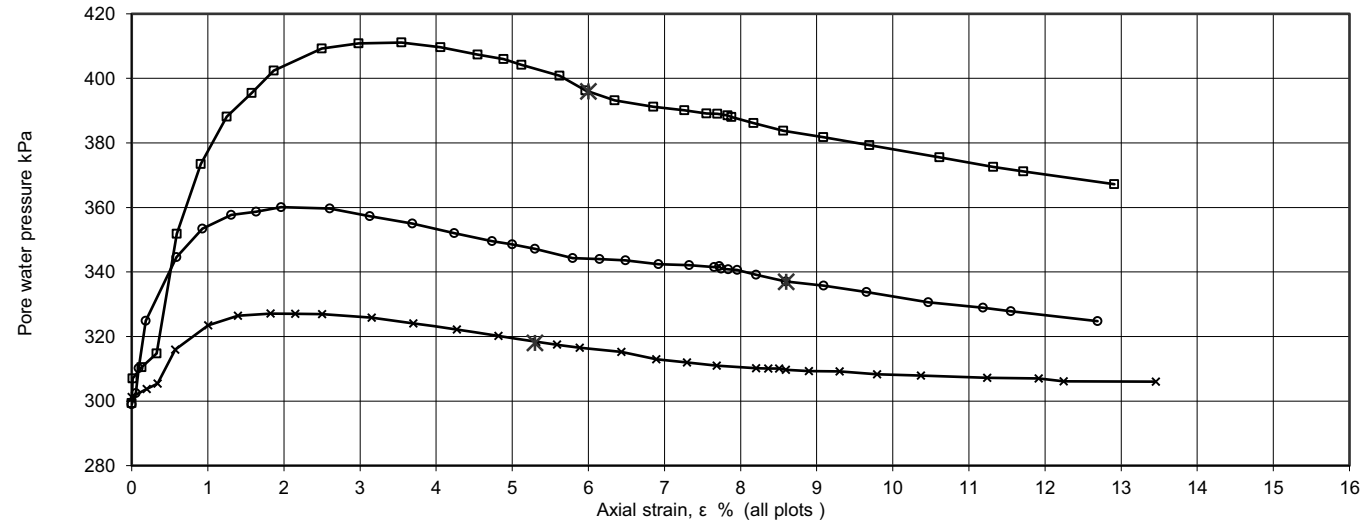
Initials **kp**

Date 27/10/2016

	Consolidated Undrained Triaxial Compression Test with measurement of pore pressure			Job Ref	21612
				Borehole/Pit No.	BHL003
Site Name	Rail Central			Sample No.	-
Project ID	C151171	Client	Hydrock	Depth m	3.00
Compression stages - graphical data				Sample Type	B
				Schedule received	21/09/2016
				Date started	24/10/2016







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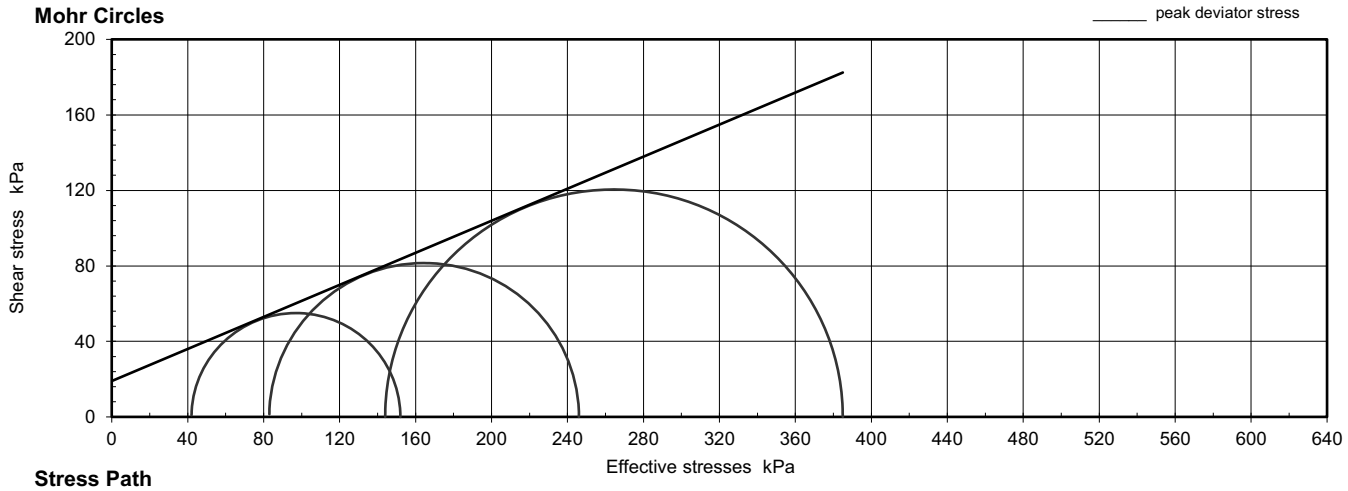
Date 27/10/2016

	Consolidated Undrained Triaxial Compression Test with measurement of pore pressure			Job Ref	21612
				Borehole/Pit No.	BHL003
Site Name	Rail Central			Sample No.	-
Project ID	C151171	Client	Hydrock	Depth m	3.00
Compression stages - table of results and interpretation				Sample Type	B
				Schedule received	21/09/2016
				Date started	24/10/2016

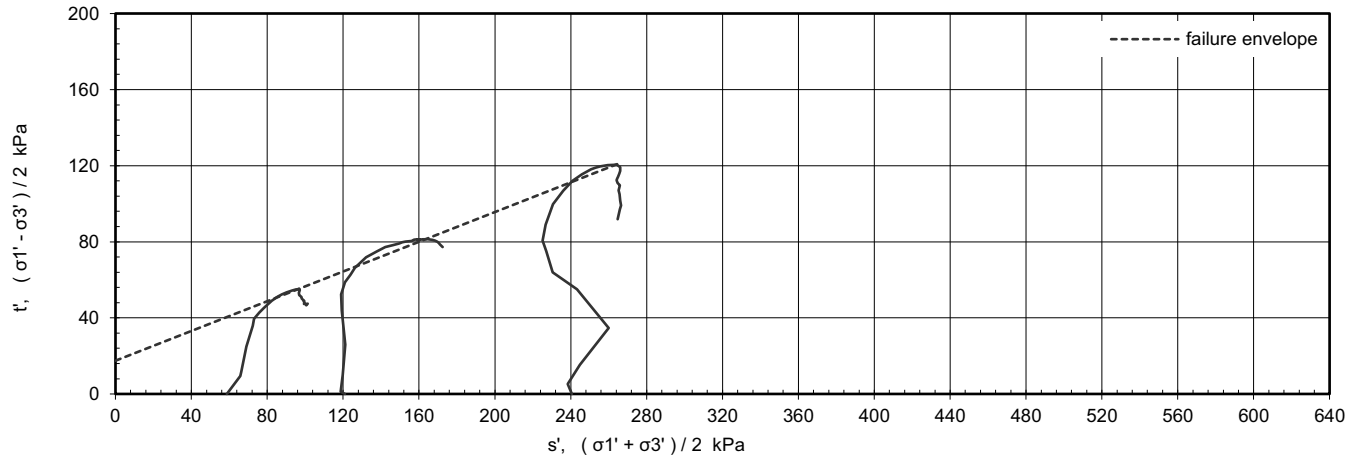
Failure criterion : Maximum deviator stress

Specimen	Cell pressure kPa	Initial pwp kPa	Initial σ3' kPa	Rate of strain %/hr	Axial strain, εf %	(σ1' / σ3') f	(σ1' - σ3') f kPa	uf kPa	σ3' f kPa	σ1' f kPa	Af
1	360	300	60	0.40	5.3	3.65	110	318	42	152	0.15
2	420	300	120	0.48	8.6	2.96	163	337	83	246	0.23
3	540	300	240	0.43	6.0	2.68	241	396	144	385	0.40

Mohr Circles

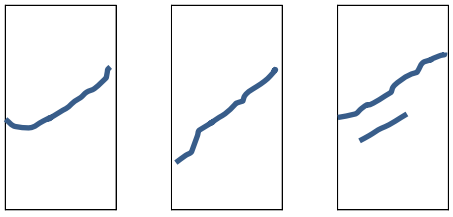


Stress Path



Shear Strength Parameters			Linear regression	Manual re-assessment
At Maximum deviator stress	c '	kPa	18.6	-
	Ø '	degrees	23.0	-

Mode of failure



Remarks

General Deviator stresses corrected for area change, vertical side drains and up to 0.3 mm thick rubber membrane/

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Date 27/10/2016

Determination of shear strength using the Small Shearbox Apparatus

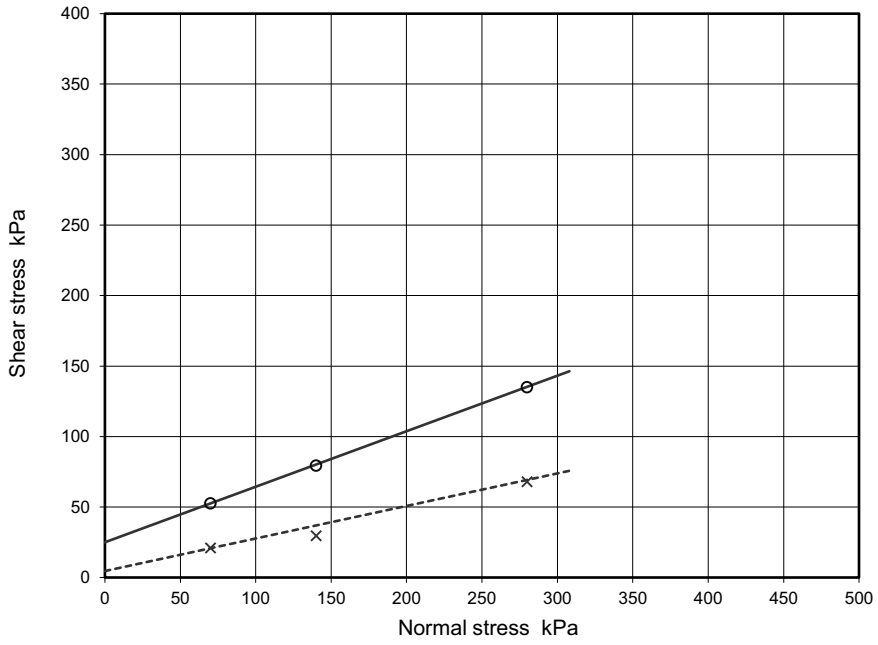
Job Ref	21612				
Borehole/Pit No.	BHRT002				
Site Name	Rail Central			Sample No.	-
Soil Description	Dark grey and occasional orangish brown silty CLAY with occasional selenite crystals			Depth m	3.50
				Sample Type	U
Project No.	C151171	Client	Hydrock	Sample received	15/09/2016
				Schedule received	21/09/2016
Test Method	BS1377 : Part 7 : 1990, clause 5			Date test started	21/11/2016
Preparation Details				Date completed	25/11/2016

Specimen Details

		Test No.	1	2	3				
Initial	Height		20.0	20.0	20.0				mm
	Bulk Density		2.02	2.00	2.01				Mg/m³
	Moisture Content		24.1	24.5	23.6				%
	Dry density		1.63	1.61	1.63				Mg/m³
	Voids ratio		0.656	0.677	0.656				
	Degree of Saturation		99	98	97				%
Consolidation	Consolidation / Normal Stress applied		**70**	**140**	**280**				kPa
	Change in height during consolidation*		-0.442	-0.978	-1.700				mm
	Voids ratio after consolidation		0.619	0.595	0.515				
After test	Final Moisture content		25.8	25.8	25.3				

Shearing stage(s)

Rate of displacement	Peak	0.00400	0.00400	0.00400				mm/min
	Residual	0.04500	0.04500	0.04500				mm/min
Peak values, (o)	Relative horizontal displacement	1.25	1.91	1.41				mm
	Shear stress	52.6	79.3	134.9				kPa
	Vertical Movement at peak shear stress*	-0.44	-1.04	-1.76				mm
Residual values, (x)	No. of traverses (including peak run)	5	5	5				
	Relative horizontal displacement	33.20	34.06	32.94				mm
	Shear stress	21.0	29.6	67.9				kPa
	Vertical movement at residual shear stress*	-0.62	-1.46	-3.64				mm



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c '	kPa	25	-
Ø '	degrees	21.5	-

Residual strength, (x)			
c 'R	kPa	4.6	-
Ø 'R	degrees	13	-

Remarks :

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Sheet 1 of 2

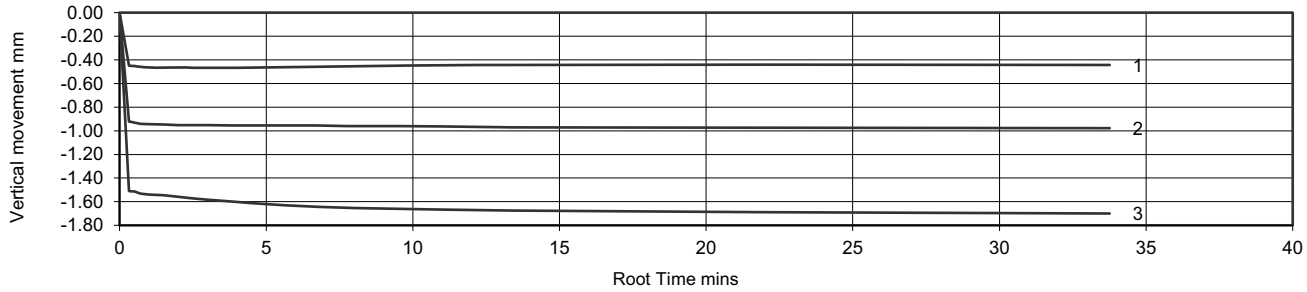
Checked and Approved
Initials kp
Date 28/11/2016

2519

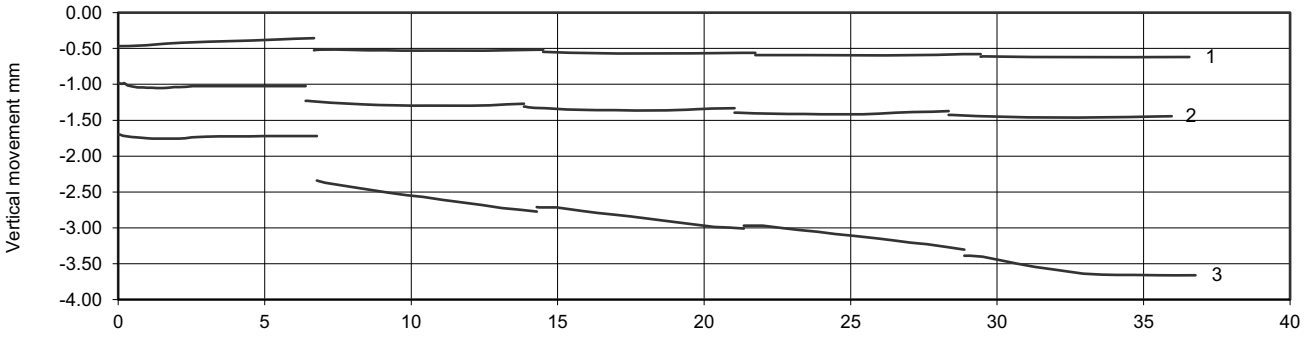
Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

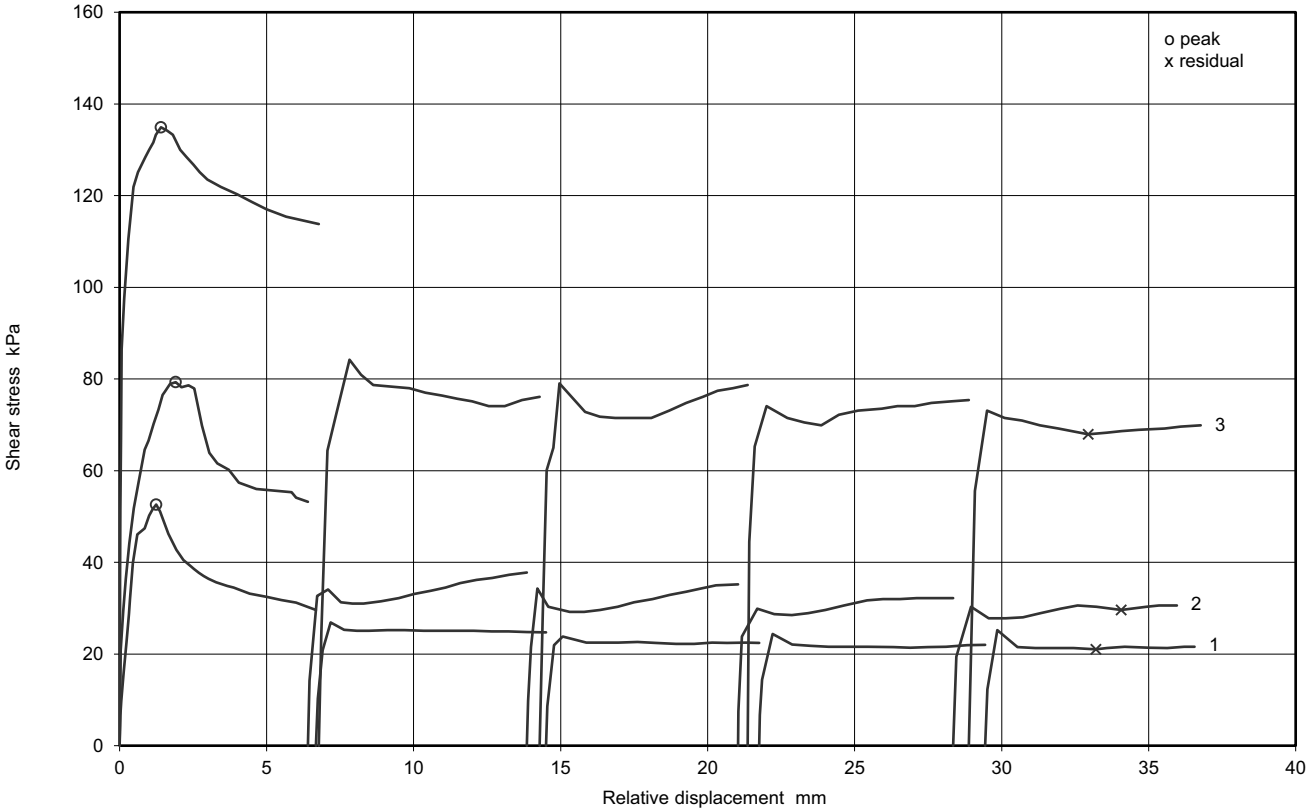
	Determination of shear strength using the Small Shearbox Apparatus			Job Ref	21612
				Borehole/Pit No.	BHRT002
Site Name	Rail Central			Sample No.	-
Soil Description	Dark grey and occasional orangish brown silty CLAY with occasional selenite crystals			Depth m	3.50
				Sample Type	U
Project No.	C151171	Client	Hydrock	Date of Test	21/11/2016

Consolidation stage(s)



Shearing stage(s)





*Note : Vertical movement/change in height is recorded as negative for reduced height (settlement) and positive for increased height (swell).

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Sheet 2 of 2

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Date 28/11/2016

2519 Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

Determination of shear strength using the Large Shearbox Apparatus

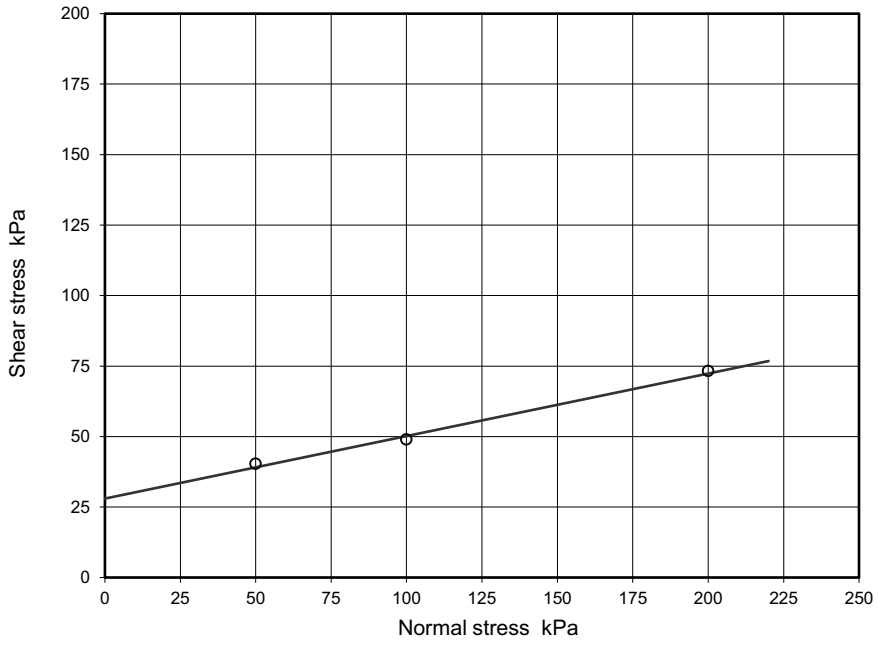
Site Name	Rail Central			Sample No.	-
Soil Description	Brown sandy silty CLAY with rare fine gravel			Depth m	1.50
				Sample Type	B
Project No.	C151171	Client	Hydrock	Sample received	15/09/2016
				Schedule received	21/09/2016
Test Method	BS1377 : Part 7 : 1990, clause 5			Date test started	22/09/2016
Preparation Details				Date completed	12/11/2016
Job Ref					21612
Borehole/Pit No.					TPG034

Specimen Details

		Test No.						
Initial	Height		89.0	89.0	89.0				mm
	Bulk Density		2.09	2.09	2.09				Mg/m³
	Moisture Content		16.3	16.3	16.3				%
	Dry density		1.80	1.80	1.80				Mg/m³
	Voids ratio		0.500	0.500	0.500				
	Degree of Saturation		88	88	88				%
Consolidation	Consolidation / Normal Stress applied		**50**	**100**	**200**				kPa
	Change in height during consolidation*		-2.150	-3.400	-4.780				mm
	Voids ratio after consolidation		0.464	0.443	0.419				
After test	Final Moisture content		16.3	15.5	15.6				

Shearing stage(s)

Rate of displacement	Peak	0.12000	0.12000	0.12000				mm/min
	Residual							mm/min
Peak values, (o)	Relative horizontal displacement	20.68	29.30	34.48				mm
	Shear stress	40.3	48.9	73.2				kPa
	Vertical Movement at peak shear stress*	-2.51	-4.02	-5.53				mm
Residual values, (x)	No. of traverses (including peak run)	1	1	1				
	Relative horizontal displacement							mm
	Shear stress							kPa
	Vertical movement at residual shear stress*							mm



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c '	kPa	28	-
Ø '	degrees	12.5	-

Residual strength, (x)			
c 'R	kPa	[0.0]	-
Ø 'R	degrees	[ ]	-

Remarks :

K4 SOILS LABORATORY Unit 8 Olds Close
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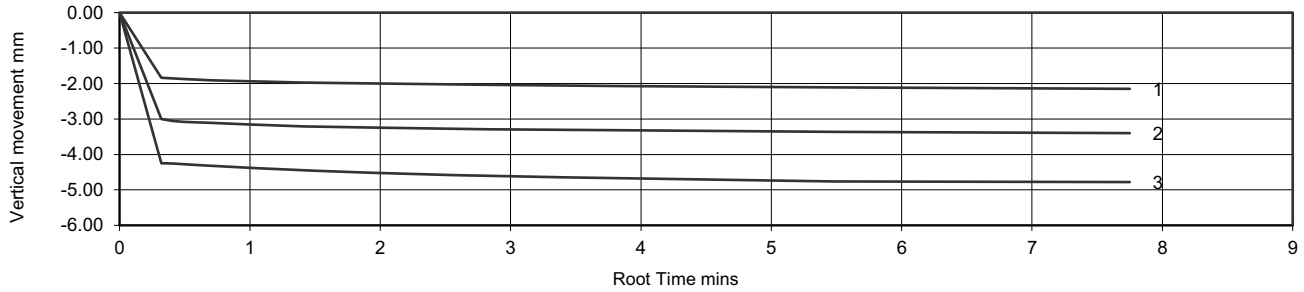
Checked and Approved
Initials kp
Date 25/11/2016

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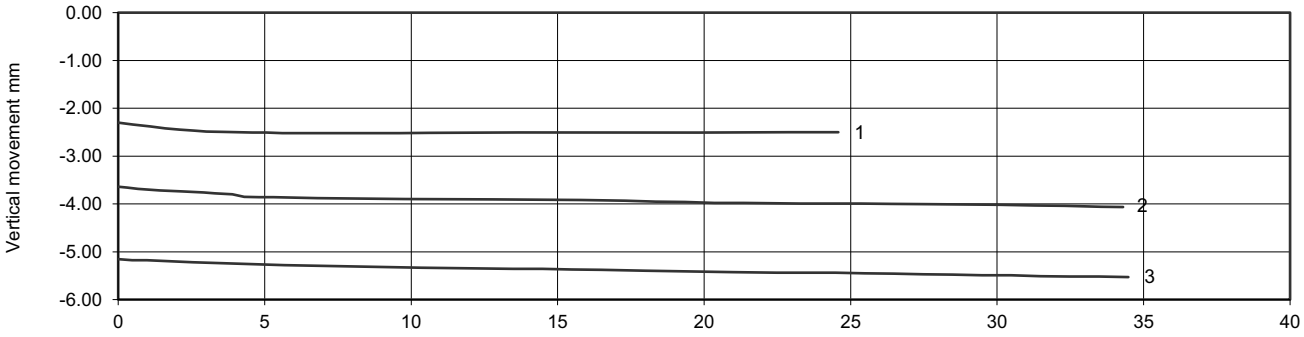
Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

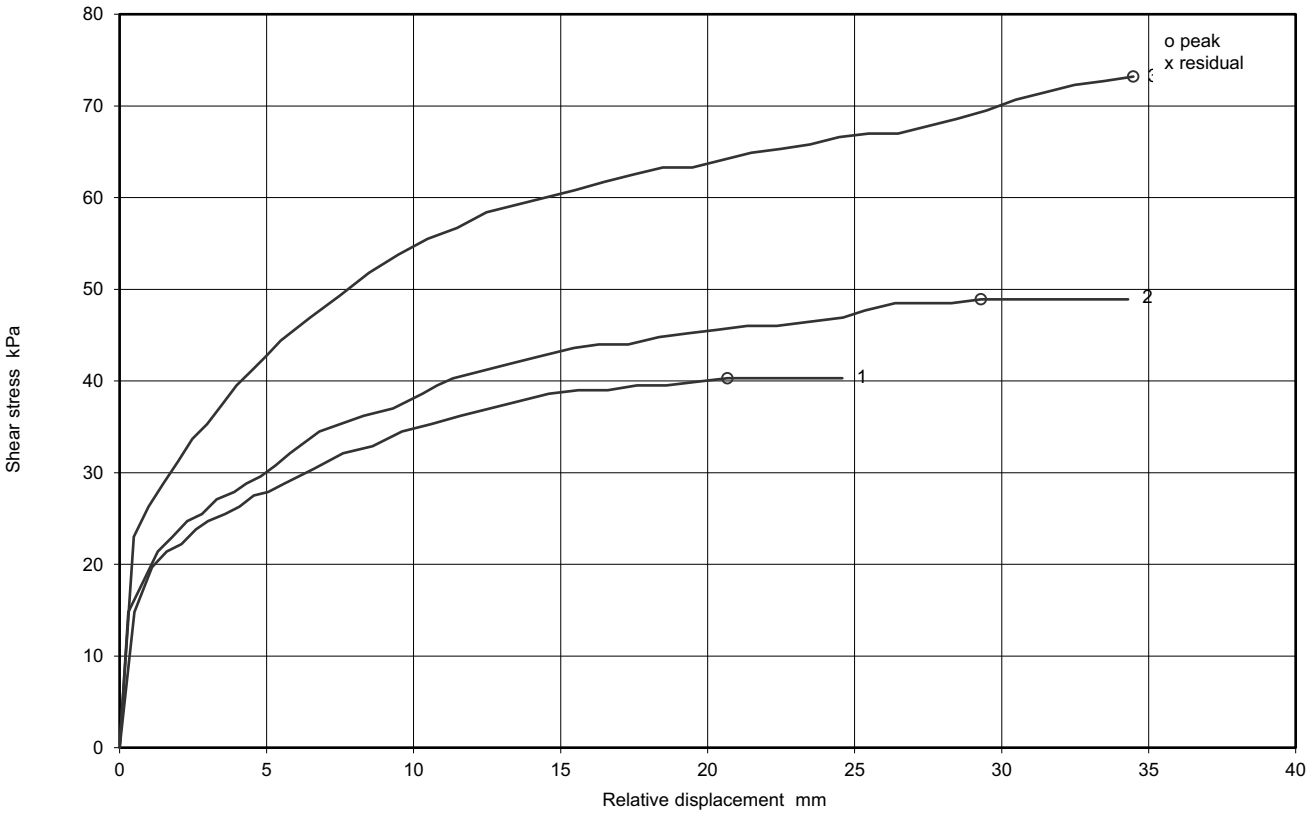
	Determination of shear strength using the Large Shearbox Apparatus			Job Ref	21612
				Borehole/Pit No.	TPG034
Site Name	Rail Central			Sample No.	-
Soil Description	Brown sandy silty CLAY with rare fine gravel			Depth m	1.50
				Sample Type	W
Project No.	C151171	Client	Hydrock	Date of Test	22/09/2016

Consolidation stage(s)



Shearing stage(s)





*Note : Vertical movement/change in height is recorded as negative for reduced height (settlement) and positive for increased height (swell).

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Initials	kp
Date	25/11/2016

Determination of shear strength using the Large Shearbox Apparatus

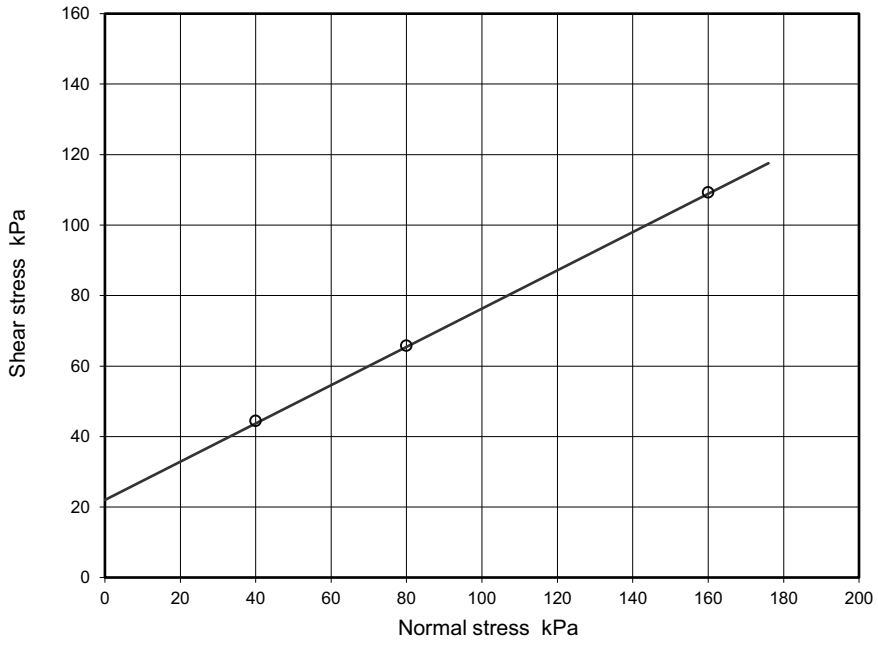
Site Name	Rail Central			Job Ref	21612
				Borehole/Pit No.	TPG036
				Sample No.	-
Soil Description	Orangish brown SAND with occasional fm sub-angular gravel			Depth m	1.00
				Sample Type	B
Project No.	C151171	Client	Hydrock	Sample received	15/09/2016
				Schedule received	21/09/2016
Test Method	BS1377 : Part 7 : 1990, clause 5			Date test started	11/11/2016
Preparation Details				Date completed	12/11/2016

Specimen Details

		Test No.						
Initial	Height	137.0	137.0	137.0				mm
	Bulk Density	1.69	1.69	1.69				Mg/m³
	Moisture Content	2.6	2.6	2.6				%
	Dry density	1.65	1.65	1.65				Mg/m³
	Voids ratio	0.612	0.612	0.612				
	Degree of Saturation	11	11	11				%
Consolidation	Consolidation / Normal Stress applied	**40**	**80**	**160**				kPa
	Change in height during consolidation*	-0.300	-0.660	-1.320				mm
	Voids ratio after consolidation	0.608	0.604	0.596				
After test	Final Moisture content	2.4	2.4	2.4				

Shearing stage(s)

Rate of displacement	Peak	1.00000	1.00000	1.00000				mm/min
	Residual							mm/min
Peak values, (o)	Relative horizontal displacement	3.00	11.00	8.00				mm
	Shear stress	44.4	65.8	109.3				kPa
	Vertical Movement at peak shear stress*	0.00	-0.69	-1.53				mm
Residual values, (x)	No. of traverses (including peak run)	1	1	1				
	Relative horizontal displacement							mm
	Shear stress							kPa
	Vertical movement at residual shear stress*							mm



Shear Strength Parameters

Peak strength, (o)		Regression	Manual
c '	kPa	22	-
Ø '	degrees	28.5	-

Residual strength, (x)

c 'R	kPa	[0.0]	-
Ø 'R	degrees	[ ]	-

Remarks :

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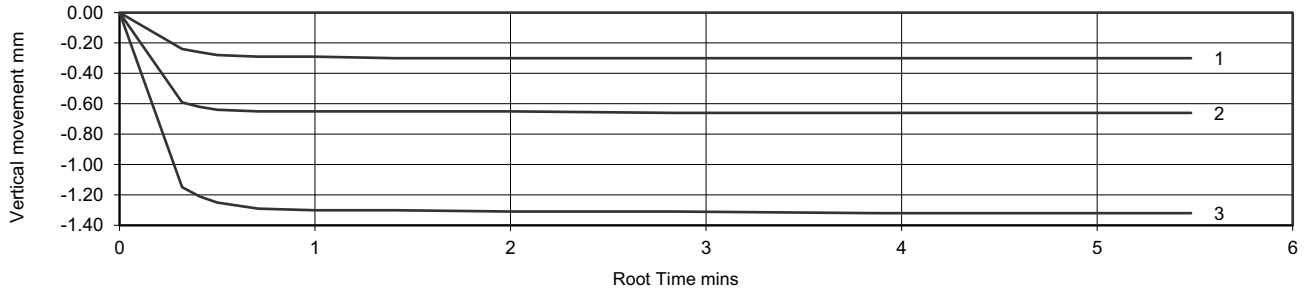
Checked and Approved
Initials kp
Date 14/11/2016

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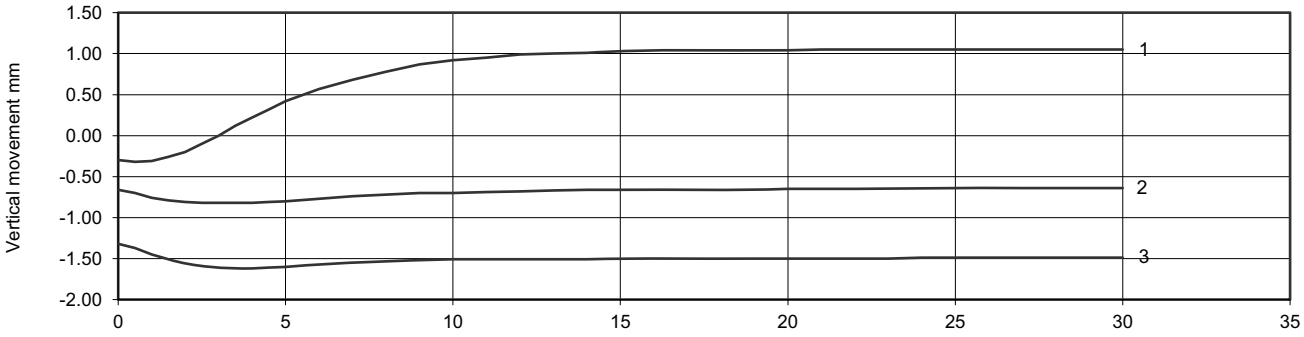
Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

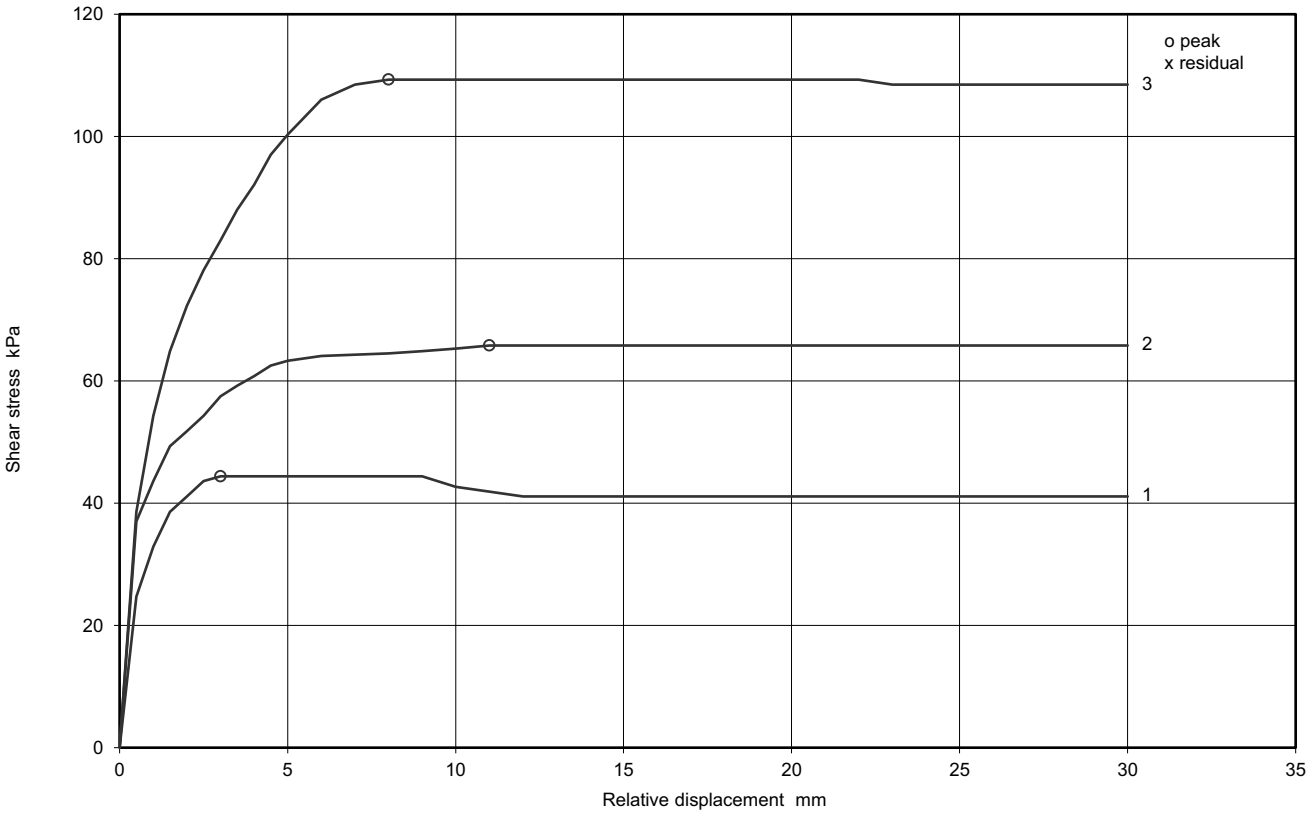
	Determination of shear strength using the Large Shearbox Apparatus			Job Ref	21612
				Borehole/Pit No.	TPG036
Site Name	Rail Central			Sample No.	-
Soil Description	Orangish brown SAND with occasional fm sub-angular gravel			Depth m	1.00
				Sample Type	B
Project No.	C151171	Client	Hydrock	Date of Test	11/11/2016

Consolidation stage(s)



Shearing stage(s)





*Note : Vertical movement/change in height is recorded as negative for reduced height (settlement) and positive for increased height (swell).

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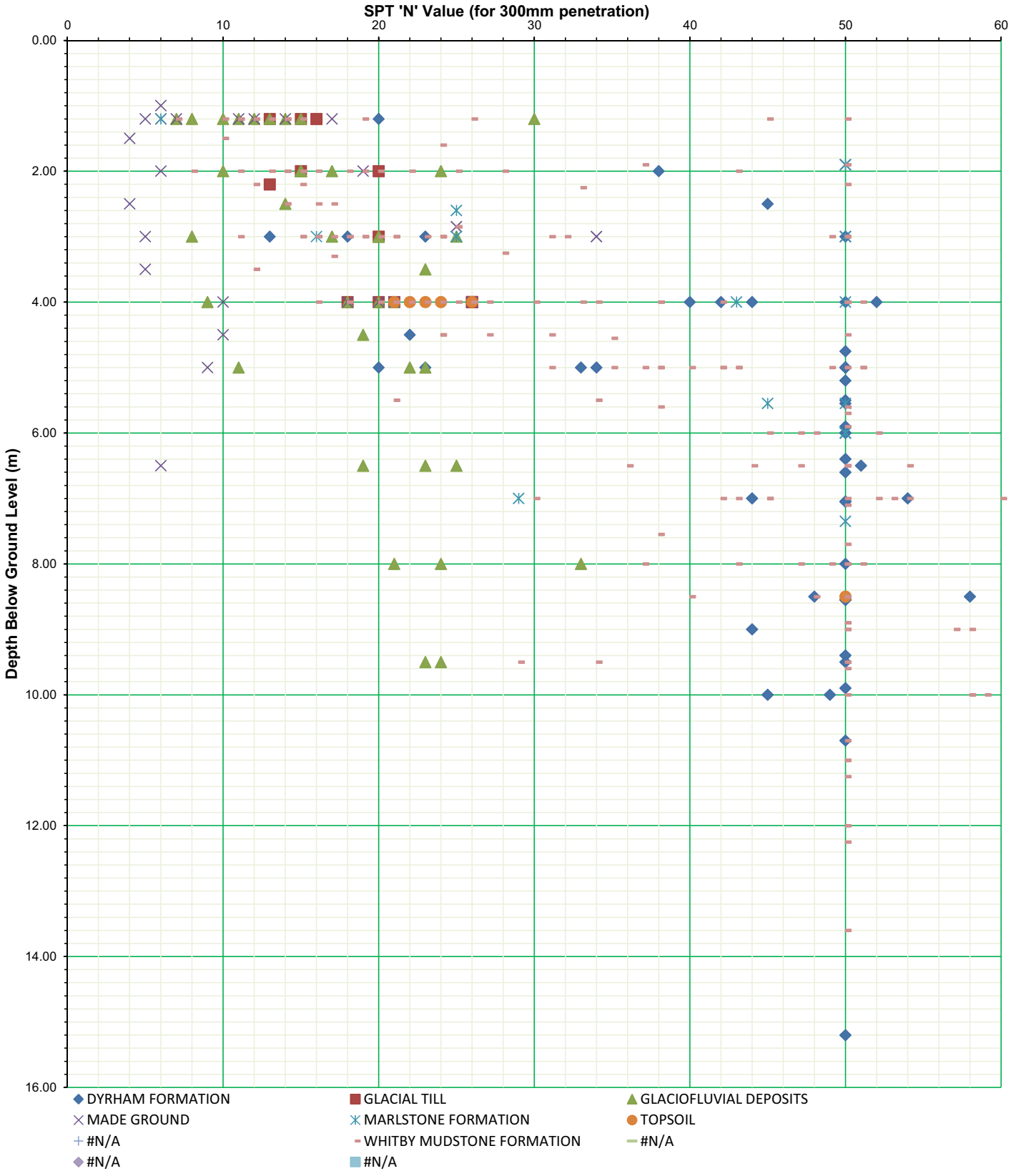
2519 Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

MSF-5-R14

Hydrock

SPT 'N' VALUES vs DEPTH

Site:	Client:	Contract No.	C151171
Rail Central	Ashfield Land	All Data	

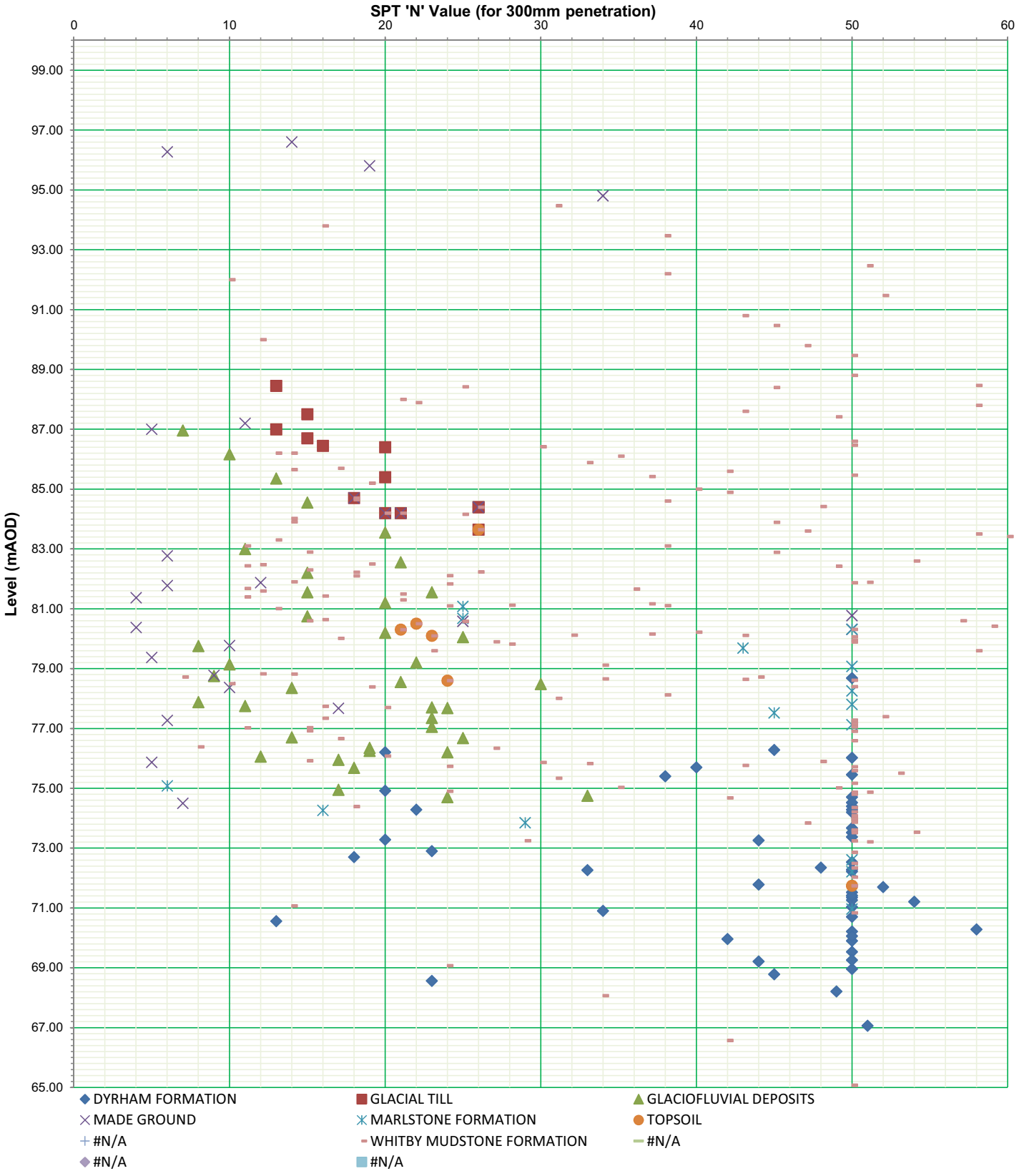


Version	0.1	Date	16/07/2015

Hydrock

SPT 'N' VALUES vs LEVEL

Site:	Client:	Contract No.	C151171
Rail Central	Ashfield Land	All Data	

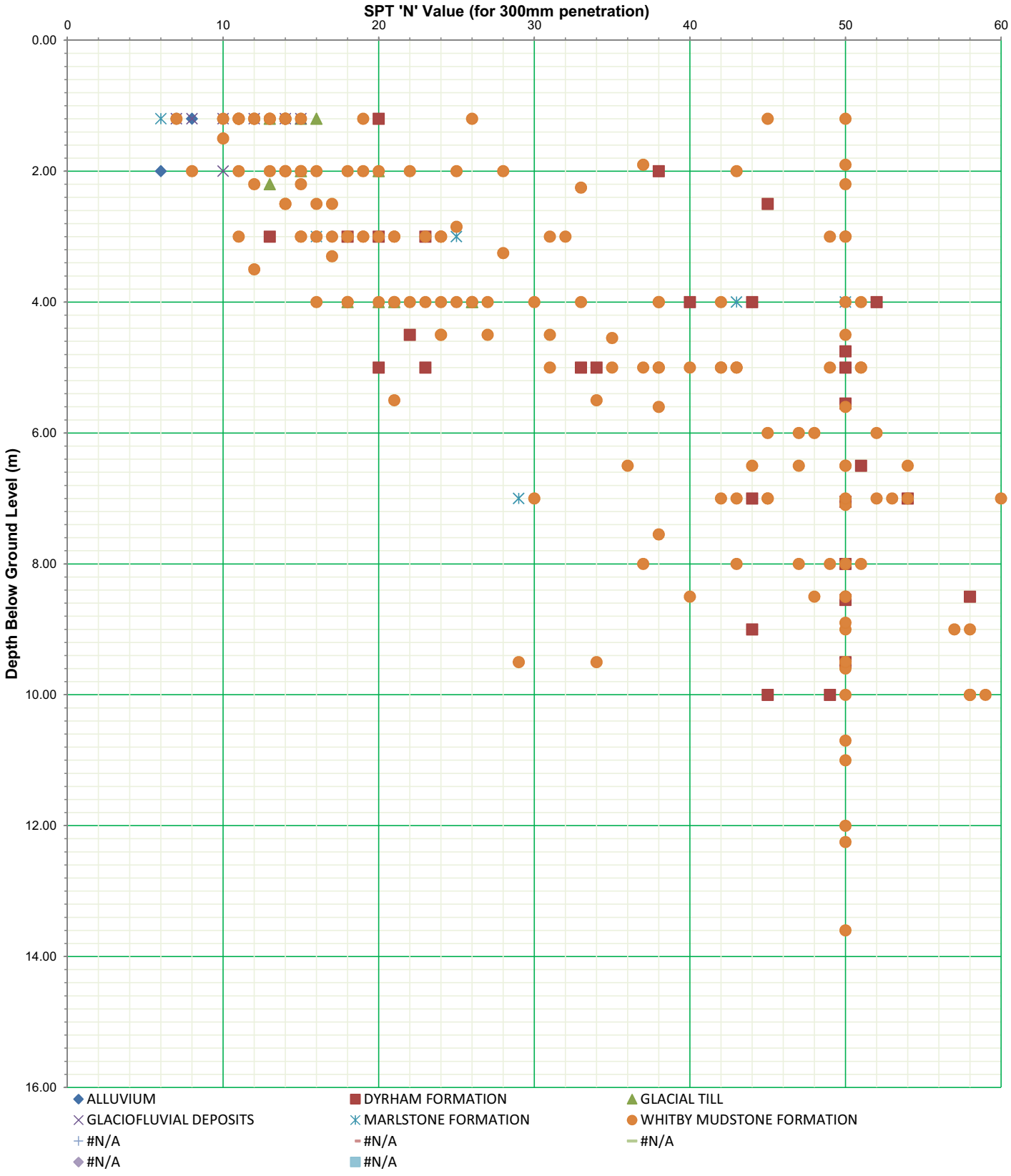


Version	0.1	Date	16/07/2015

Hydrock

SPT 'N' VALUES vs DEPTH COHESIVE STRATA

Site:	Client:	Contract No.	C151171
Rail Central	Ashfield Land	All Data	

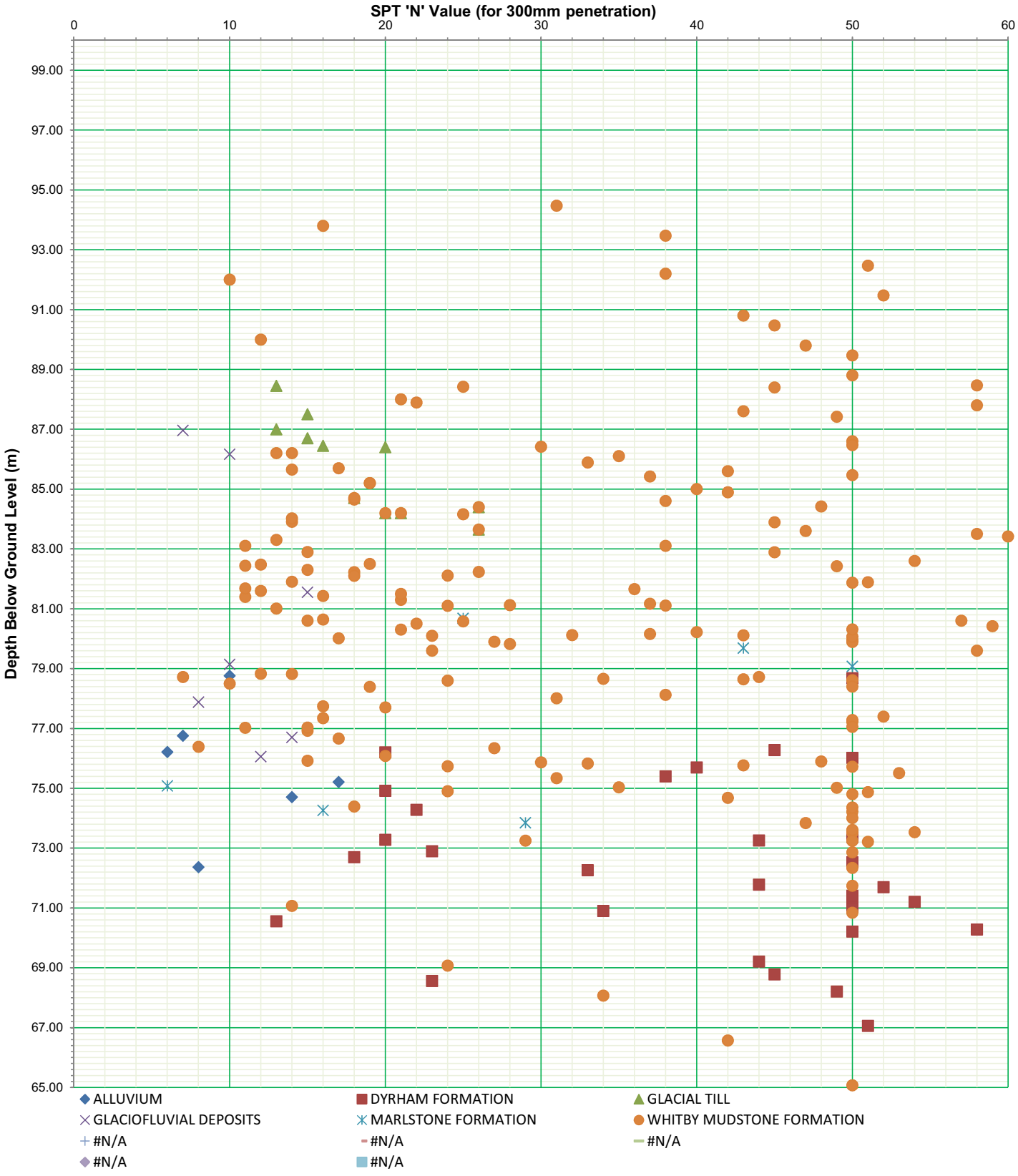


Version	0.1	Date	16/07/2015

Hydrock

SPT 'N' VALUES vs LEVEL COHESIVE STRATA

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Rail Central	Ashfield Land	All Data	

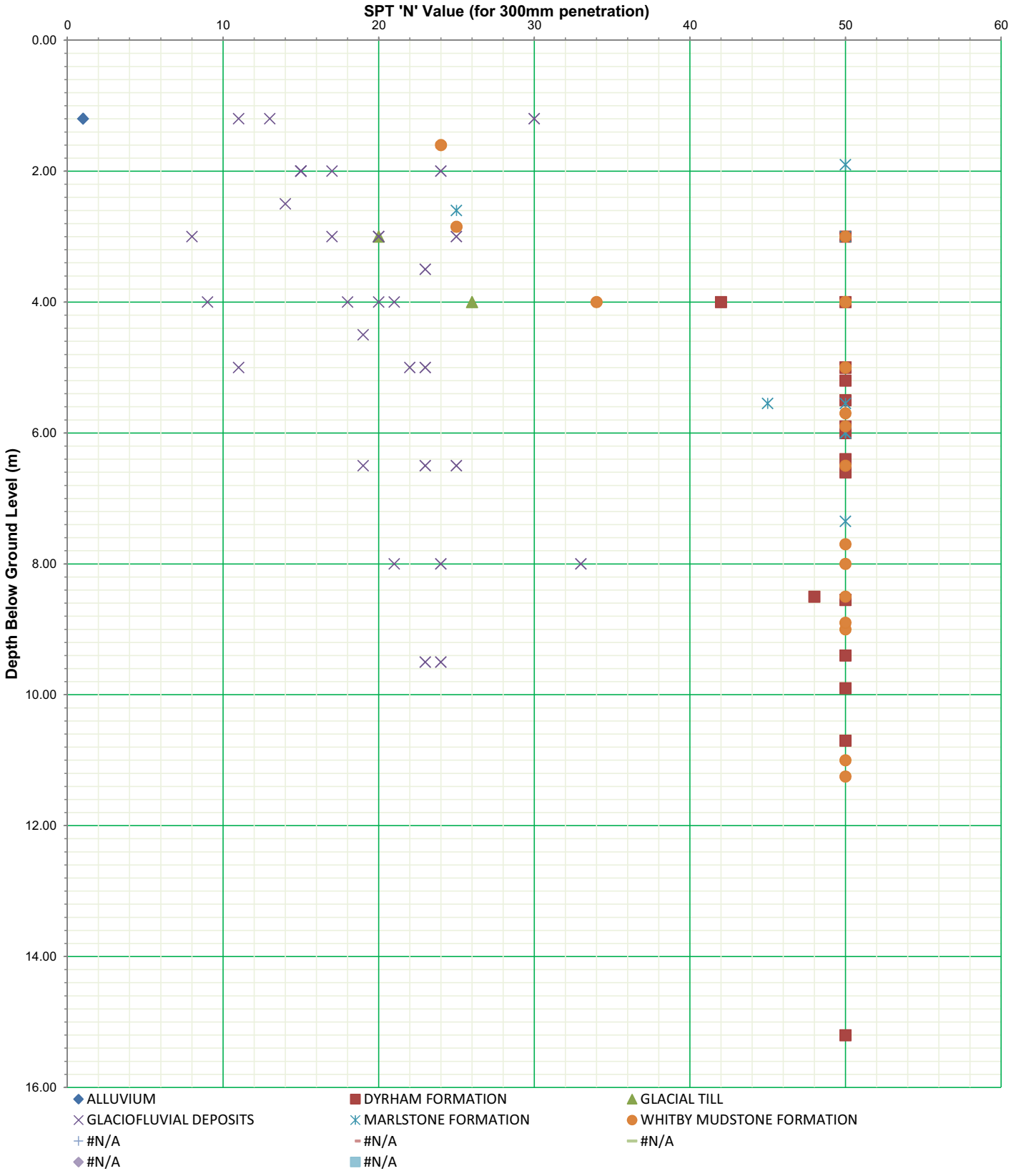


Version	0.1	Date	16/07/2015

Hydrock

SPT 'N' VALUES vs DEPTH GRANULAR STRATA

Site:	Client:	Contract No.	C151171
Rail Central	Ashfield Land	All Data	

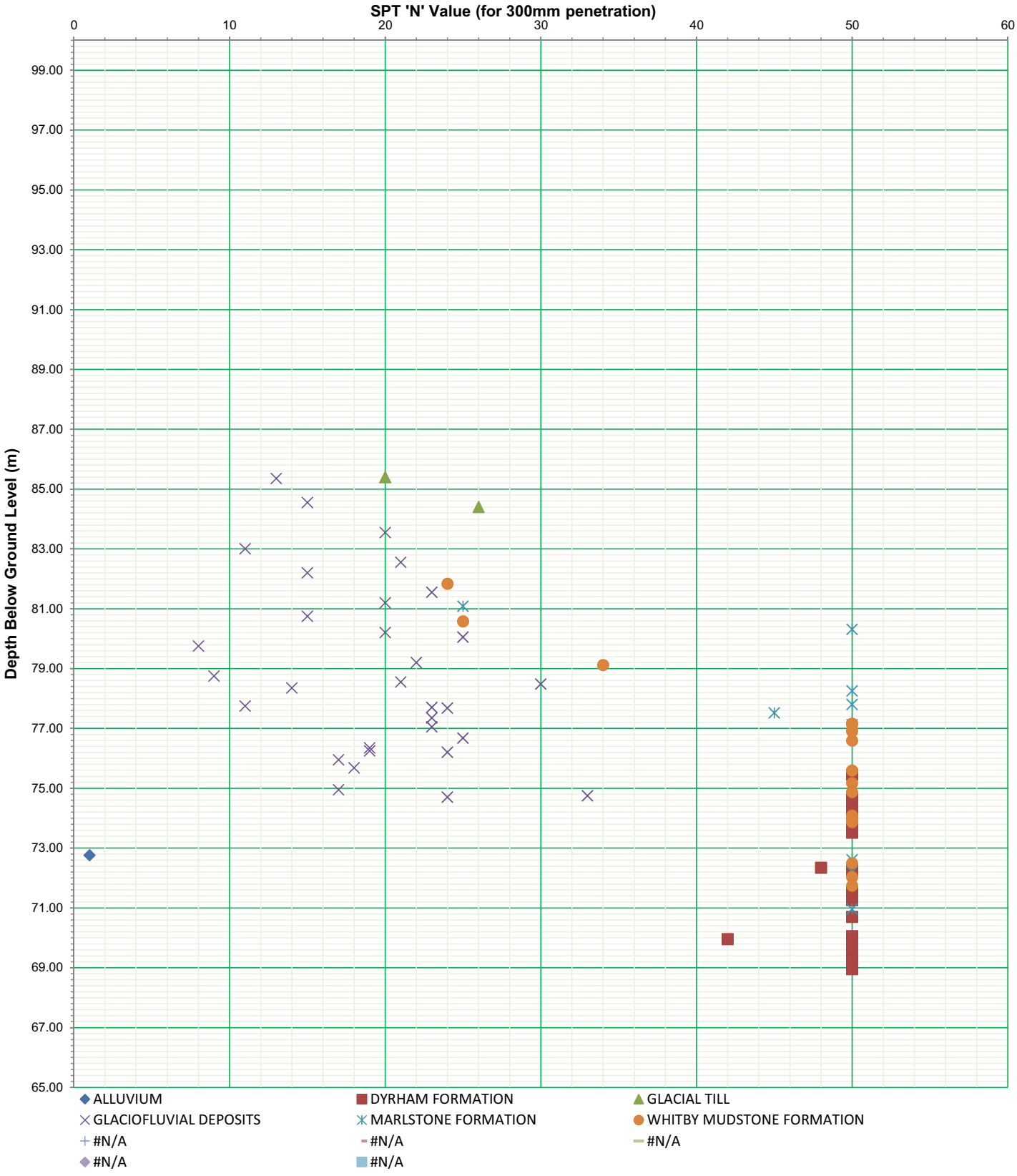


Version	0.1	Date	16/07/2015

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SPT 'N' VALUES vs LEVEL GRANULAR STRATA

Site:	Client:	Contract No.	C151171
Rail Central	Ashfield Land	All Data	

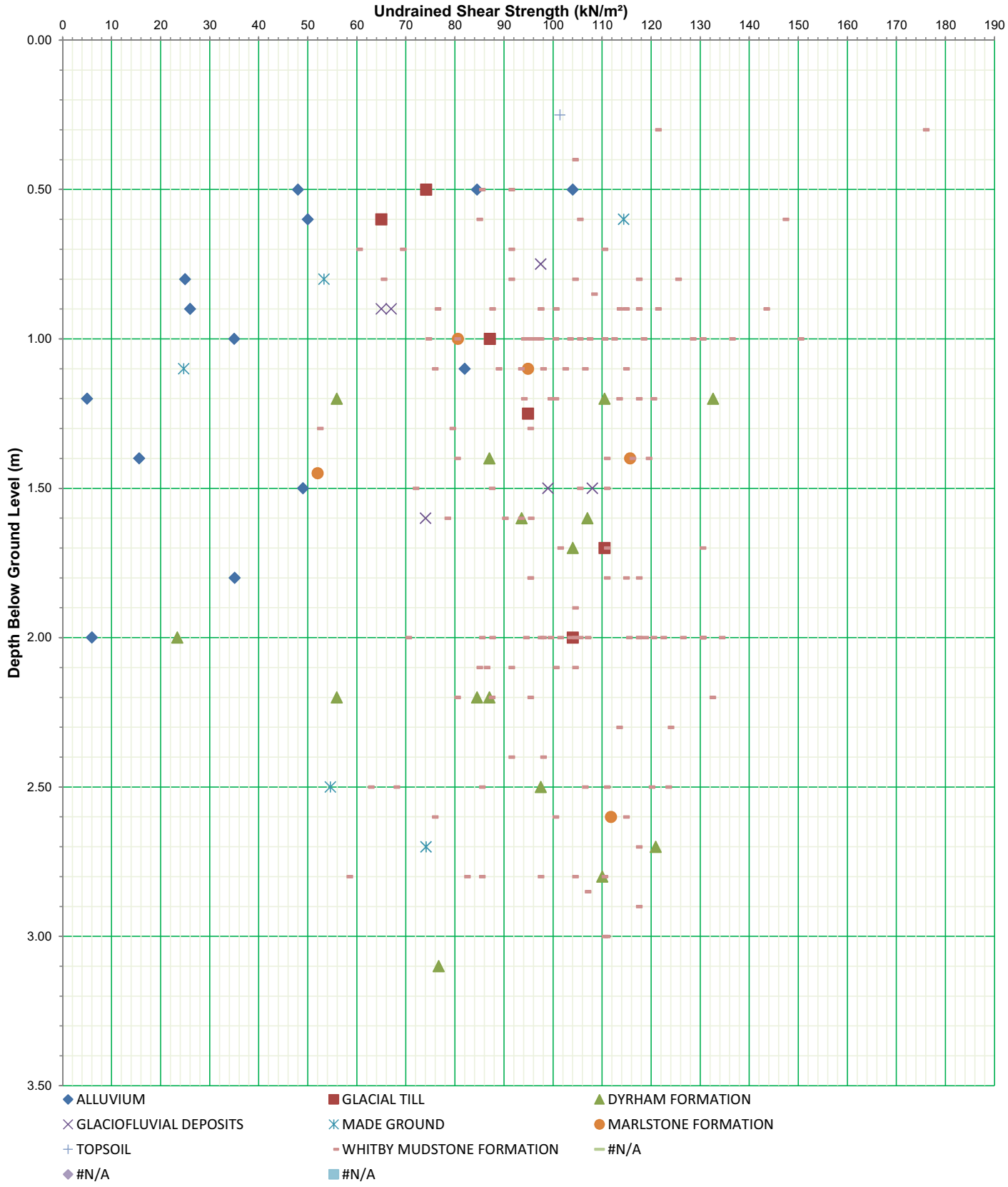


Version	0.1	Date	16/07/2015

Hydrock

UNDRAINED SHEAR STRENGTH vs DEPTH

Site:	Client:	Contract No.	C151171
Rail Central	Ashfield Land	Hand Shear Vane	

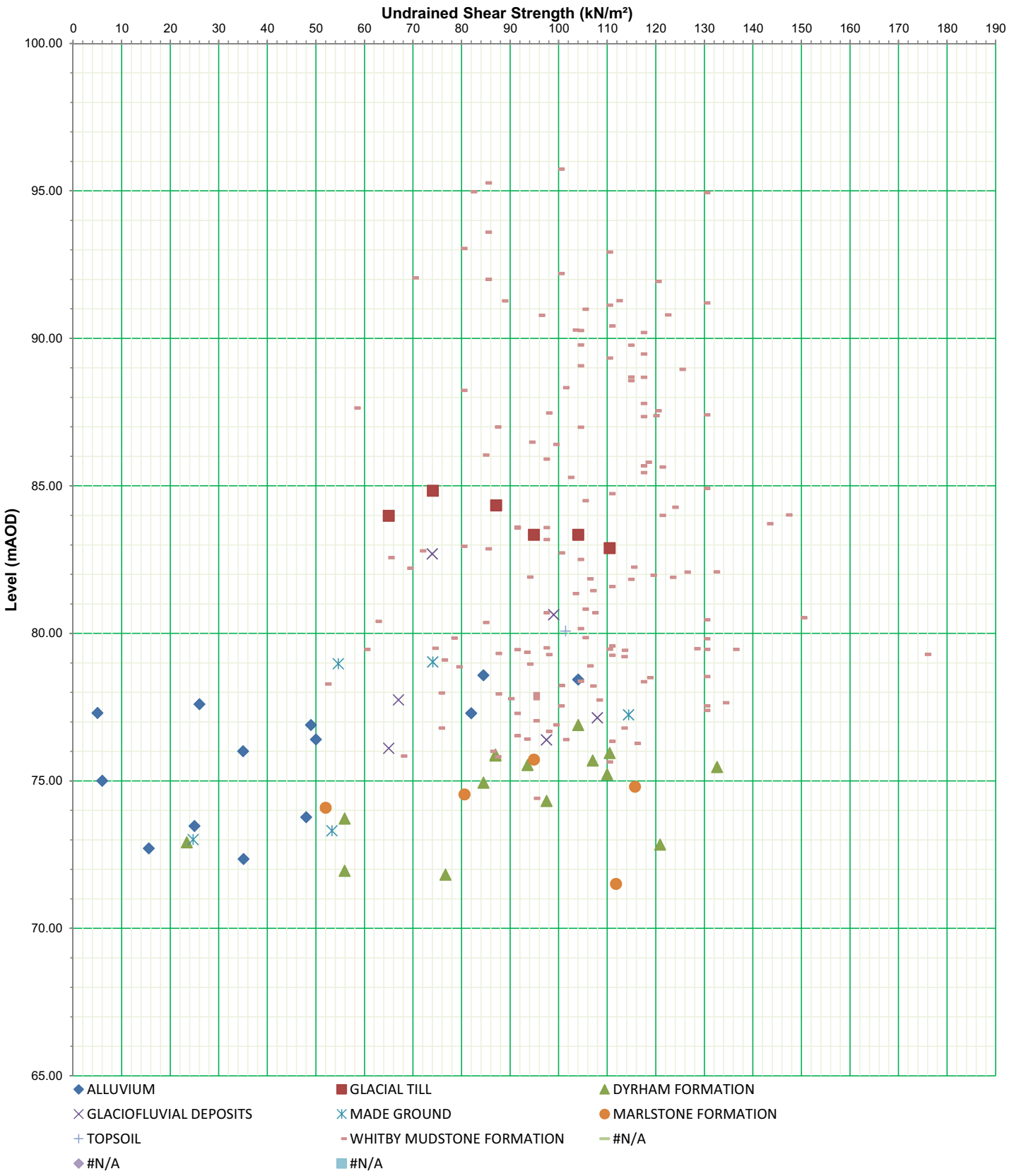


Version	0.1	Date	16/07/2015

Hydrock

UNDRAINED SHEAR STRENGTH vs LEVEL

Site:	Client:	Contract No.	C151171
Rail Central	Ashfield Land	Hand Shear Vane	



Version	0.1	Date	16/07/2015

Appendix D

Site Monitoring Data

Site: Rail Central, Milton Malsor
Job number: C 151171
Client: Ashfield Land

Gas analyser: GFM435 No. 11874
Equipment check OK: Y
Service in date: Y

Calibration check OK: Y
Name of person monitoring: Rod Langley

Notes on site conditions:

13/14th October Weather conditions = Fair occassional light showers
17th November 2016 Weather conditions = Strong wind with frequent heavy showers
21st November 2016 Weather conditions = Constant rain, sometimes very heavy
25th November 2016 Weather conditions = Dry with large areas of surface water in the fields
20th December 2016 Weather conditions = Mainly dry but ground conditions soft and wet
12th/13th January 2017 Weather conditions = Wintery showers and snow. Ground conditions - Wet and soft
30th/31st January 2017 Weather conditions = Drizzle Ground conditions = Wet & soft
20/21st April 2017 Weather conditions = Overcast but dry with slight wind
10/11. May 2017 Weather conditions = Fine and dry Ground conditions = Dry, hard and cracked
23rd June 2017 Weather conditions = Cloudy but warm with possible thunderstorm.

Notes: LEL = lower explosive limit = 5%v/v. * where the flow is less than the limit of detection of the instrument, the detection limit is reported. GSVs are rounded to 3 places.

Monitoring round		Borehole details						Pressure and flow					Gas concentrations										GSV		Local conditions
Date	Time	Borehole	Single or dual gas tap	Response zone depth (m)	Depth to water or depth of hole if dry (m)	D denotes dry hole	Volume of headspace in BH (well pipe & filter pack) (m^3)	Atmospheric pressure (hPa)	Atm pressure falling / rising /	Relative BH pressure (hPa)	Gas flow* (l/hr)	Gas flow* (absolute value) (l/hr)	VOC (as ppm using PID)	CH_4 (%v/v)		CH_4 (%LEL)		H2S (ppm)	CO (ppm)	CO_2 (%v/v)		O_2 (%v/v)		Gas Screening Value (CH_4) (l/hr)	Gas Screening Value (CO_2) (l/hr)	
														Initial	Steady	Initial	Steady			Initial	Steady	Initial	Steady			
13.10.2016		BH G019	S		3.08		0.05mØ x 3.94m	1012	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	2.0	2.0	2.3	2.3	0	0	BH in good condition. Nothing to report
13.10.2016		BH G017	S		0.55		0.05mØ x 4.00m	1012	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.4	1.4	12.0	12.0	0	0	BH in good condition. Nothing to report
13.10.2016		BH G016	S		2.96		0.05mØ x 9.02m	1012	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.9	20.9	0	0	BH in good condition. Nothing to report
13.10.2016		BH G009	S		4.94		0.05mØ x 9.42m	1010	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	2.4	2.4	19.7	19.7	0	0	BH in good condition. Nothing to report
13.10.2016		BH G007	S		6.17		0.05mØ x 7.01m	1009	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.6	0.6	20.0	20.0	0	0	BH in good condition. Nothing to report
13.10.2016		BH R004	S		2.29		0.05mØ x 9.89m	1007	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.8	0.8	20.6	20.6	0	0	BH in good condition. Nothing to report
13.10.2016		BH G015	S		7.93		0.05mØ x 7.98m	1009	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.3	0.3	20.6	20.6	0	0	BH in good condition. Nothing to report
13.10.2016		BH G014	S		7.46		0.05mØ x 10.02m	1009	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	19.4	19.4	0	0	BH in good condition. Nothing to report
13.10.2016		BH G006	S		8.78		0.05mØ x 9.27m	1007	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.3	1.3	20.4	20.4	0	0	BH in good condition. Nothing to report
13.10.2016		BH G001	S		2.45		0.05mØ x 4.03m	1006	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.4	1.4	19.9	19.9	0	0	BH in good condition. Nothing to report
13.10.2016		BH R003	S		0.81		0.05mØ x 12.23m	1006	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	3.2	3.2	15.2	15.2	0	0	BH in good condition. Nothing to report
13.10.2016		BH R001s	D		2.32		0.05mØ x 3.07m	1006	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.4	1.4	20.1	20.1	0	0	BH in good condition. Nothing to report
13.10.2016		BH R001d	D		7.16		0.05mØ x 15.12m	1006	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.4	0.4	20.5	20.5	0	0	BH in good condition. Nothing to report
13.10.2016		BH G024	S		10.23		0.05mØ x 10.96m	1007	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.0	1.0	20.0	20.0	0	0	BH in good condition. Nothing to report
13.10.2016		BH RT002	S		5.57		0.05mØ x 7.91m	1007	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.7	0.7	20.3	20.3	0	0	BH in good condition. Nothing to report
13.10.2016		BH G003	S		9.06	D	0.05mØ x 9.06m	1007	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.8	0.8	20.4	20.4	0	0	BH in good condition. Nothing to report
14.10.2016		BH RT001	S		3.40		0.05mØ x 10.26m	1007	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.7	1.7	18.3	18.3	0	0	BH in good condition. Nothing to report
14.10.2016		BH A005	S		0.94		0.05mØ x 2.96m	1007	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.8	20.8	0	0	BH in good condition. Nothing to report
14.10.2016		BH A004	S		1.39		0.05mØ x 3.10m	1003	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.5	1.5	19.6	19.6	0	0	BH in good condition. Nothing to report
14.10.2016		BH A003	S		1.52		0.05mØ x 8.60m	1003	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.2	0.2	20.7	20.7	0	0	BH in good condition. Nothing to report
14.10.2016		BH A001	S		2.57		0.05mØ x 5.52m	1003	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.6	1.6	18.0	18.0	0	0	BH in good condition. Nothing to report
14.10.2016		BH A002	S		2.19		0.05mØ x 2.97m	1002	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.5	0.5	20.6	20.6	0	0	BH in good condition. Nothing to report
17.11.2016		BH A013	S		1.62		0.05mØ x 5.22m	988	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.9	20.9	0	0	BH in good condition. Nothing to report
17.11.2016		BH A010	S		0.79		0.05mØ x 2.63m	985	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.9	20.9	0	0	BH in good condition. Nothing to report
17.11.2016		BH L010	S		2.60		0.05mØ x 3.85m	986	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.6	20.6	0	0	BH in good condition. Nothing to report
17.11.2016		BH A015	S		0.18		0.05mØ x 5.61m	985	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.4	1.4	17.1	17.1	0	0	BH in good condition. Nothing to report
17.11.2016		BH L007	S		1.91		0.05mØ x 4.63m	985	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.0	1.0	19.5	19.5	0	0	BH in good condition. Nothing to report
17.11.2016		BH L009	S		6.34		0.05mØ x 8.64m	984	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.2	0.2	20.5	20.5	0	0	BH in good condition. Nothing to report
17.11.2016		BH L008	S		4.25	D	0.05mØ x 4.25m	984	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	2.9	2.9	16.1	16.1	0	0	BH in good condition. Nothing to report
17.11.2016		BH L003	S		0.78		0.05mØ x 5.23m	985	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.7	20.7	0	0	BH in good condition. Nothing to report
17.11.2016		BH L001	S		4.29		0.05mØ x 5.67m	985	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.8	0.8	17.6	17.6	0	0	BH in good condition. Nothing to report
17.11.2016		BH L002	S		0.87		0.05mØ x 3.92m	985	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.7	0.7	17.8	17.8	0	0	BH in good condition. Nothing to report
17.11.2016		BH G012	S		1.68		0.05mØ x 3.56m	984	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.6	0.6	20.5	20.5	0	0	BH in good condition. Nothing to report
17.11.2016		BH G010	S		1.55		0.05mØ x 6.53m	984	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.8	0.8	19.9	19.9	0	0	BH in good condition. Nothing to report
17.11.2016		BH G005	S		3.50		0.05mØ x 5.44m	985	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	2.4	2.4	18.8	18.8	0	0	BH in good condition. Nothing to report
21.11.2016		BH RB02	S		2.83		0.05mØ x 6.08m	981	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.7	1.7	18.6	18.6	0	0	BH in good condition. Nothing to report

21.11.2016		WS S01	S		1.81		0.05mØ x 3.81m	981	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.8	0.8	19.2	19.2	0	0	BH in good condition. Nothing to report
21.11.2016		WS S04	S		1.30		0.05mØ x 4.06m	981	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.2	0.2	20.7	20.7	0	0	BH in good condition. Nothing to report
21.11.2016		WS S06	S		0.79		0.05mØ x 1.80m	981	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.9	20.9	0	0	BH in good condition. Nothing to report
21.11.2016		WS S08	S		1.20		0.05mØ x 2.883m	981	F	0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.2	0.2	20.7	20.7	0	0	BH in good condition. Nothing to report
25.11.2016		BH G019	S		2.90		0.05mØ x 3.94m	1011	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.3	1.3	13.1	13.1	0	0	BH in good condition. Nothing to report
25.11.2016		BH G017	S		0.43		0.05mØ x 4.00m	1008	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.5	1.5	12.7	12.7	0	0	BH in good condition. Nothing to report
25.11.2016		BH G016	S		3.06		0.05mØ x 9.02m	1006	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	19.9	19.9	0	0	BH in good condition. Nothing to report
25.11.2016		BH G009	S		5.04		0.05mØ x 9.42m	1012	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.1	1.1	19.2	19.2	0	0	BH in good condition. Nothing to report
25.11.2016		BH G007	S		0.31		0.05mØ x 7.01m	1013	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.3	0.3	19.3	19.3	0	0	BH in good condition. Nothing to report
25.11.2016		BH R004	S		0.41		0.05mØ x 9.89m	1013	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.9	0.9	20.5	20.5	0	0	BH in good condition. Nothing to report
25.11.2016		BH G015	S		3.00		0.05mØ x 7.98m	1013	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.4	20.4	0	0	BH in good condition. Nothing to report
25.11.2016		BH G014	S		5.57		0.05mØ x 10.02m	1013	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.9	0.9	19.3	19.3	0	0	BH in good condition. Nothing to report
25.11.2016		BH G006	S		1.48		0.05mØ x 9.27m	1013	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.6	0.6	19.9	19.9	0	0	BH in good condition. Nothing to report
25.11.2016		BH G001	S		2.31		0.05mØ x 4.03m	1014	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.1	1.1	19.5	19.5	0	0	BH in good condition. Nothing to report
25.11.2016		BH R003	S		0.05		0.05mØ x 12.23m			No gas readings. BH flooded																
25.11.2016		BH R001s	D		2.04		0.05mØ x 3.07m	1013	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.8	0.8	19.5	19.5	0	0	BH in good condition. Nothing to report
25.11.2016		BH R001d	D		7.02		0.05mØ x 15.12m	1013	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.3	1.3	16.9	16.9	0	0	BH in good condition. Nothing to report
25.11.2016		BH G024	S		7.46		0.05mØ x 10.96m	1013	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.5	0.5	19.8	19.8	0	0	BH in good condition. Nothing to report
25.11.2016		BH RT002	S		0.26		0.05mØ x 7.91m	1014	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.8	20.8	0	0	BH in good condition. Nothing to report
28.11.2016		BH G003	S		0.53		0.05mØ x 9.06m	1021	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.7	0.7	20.1	20.1	0	0	BH in good condition. Nothing to report
25.11.2016		BH RT001	S		3.13		0.05mØ x 10.26m	1012	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.7	0.7	19.8	19.8	0	0	BH in good condition. Nothing to report
25.11.2016		BH A005	S		0.11		0.05mØ x 2.96m		R	No gas readings. BH flooded																
25.11.2016		BH A004	S		0.46		0.05mØ x 3.10m	1012	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.8	20.8	0	0	BH in good condition. Nothing to report
25.11.2016		BH A003	S		1.24		0.05mØ x 8.60m	1012	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.9	20.9	0	0	BH in good condition. Nothing to report
25.11.2016		BH A001	S		1.64		0.05mØ x 5.52m	1012	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.0	1.0	17.6	17.6	0	0	BH in good condition. Nothing to report
25.11.2016		BH A002	S		0.31		0.05mØ x 2.97m	1013	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.3	0.3	20.2	20.2	0	0	BH in good condition. Nothing to report
28.11.2016		BH A013	S		0.82		0.05mØ x 5.22m	1019	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.3	0.3	20.7	20.7	0	0	BH in good condition. Nothing to report
28.11.2016		BH A010	S		0.56		0.05mØ x 2.63m	1019	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.8	20.8	0	0	BH in good condition. Nothing to report
28.11.2016		BH L010	S		2.59		0.05mØ x 3.85m	1020	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.4	1.4	19.3	19.3	0	0	BH in good condition. Nothing to report
28.11.2016		BH A015	S		0.11		0.05mØ x 5.61m		R	No gas readings. BH flooded																
28.11.2016		BH L007	S		1.77		0.05mØ x 4.63m	1019	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.7	0.7	20.1	20.1	0	0	BH in good condition. Nothing to report
28.11.2016		BH L009	S		6.44		0.05mØ x 8.64m	1019	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.2	0.2	20.7	20.7	0	0	BH in good condition. Nothing to report
28.11.2016		BH L008	S		4.25	D	0.05mØ x 4.25m	1019	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.3	1.3	18.0	18.0	0	0	BH in good condition. Nothing to report
28.11.2016		BH L003	S		0.94		0.05mØ x 5.23m	1019	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.8	20.8	0	0	BH in good condition. Nothing to report
28.11.2016		BH L001	S		4.27		0.05mØ x 5.67m	1019	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.4	1.4	5.5	5.5	0	0	BH in good condition. Nothing to report
28.11.2016		BH L002	S		0.95		0.05mØ x 3.92m	1019	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.4	0.4	19.2	19.2	0	0	BH in good condition. Nothing to report
25.11.2016		BH G012	S		0.76		0.05mØ x 3.56m	1011	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.6	0.6	20.4	20.4	0	0	BH in good condition. Nothing to report
25.11.2016		BH G010	S		0.77		0.05mØ x 6.53m	1011	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.9	20.9	0	0	BH in good condition. Nothing to report
28.11.2016		BH G005	S		3.33		0.05mØ x 5.44m	1013	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	2.1	2.1	18.6	18.6	0	0	BH in good condition. Nothing to report
28.11.2016		BH RB02	S		2.94		0.05mØ x 6.08m	1021	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.1	1.1	19.4	19.4	0	0	BH in good condition. Nothing to report
28.11.2016		WS S01	S		1.90		0.05mØ x 3.81m	1021	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.4	1.4	19.5	19.5	0	0	BH in good condition. Nothing to report
28.11.2016		WS S04	S		1.44		0.05mØ x 4.06m	1021	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.8	20.8	0	0	BH in good condition. Nothing to report
28.11.2016		WS S06	S		1.53		0.05mØ x 1.80m	1021	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.8	20.8	0	0	BH in good condition. Nothing to report
28.11.2016		WS S08	S		1.60		0.05mØ x 2.883m	1021	R	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.3	0.3	20.7	20.7	0	0	BH in good condition. Nothing to report
20.12.2016		BH G019	S		2.74		0.05mØ x 3.94m	1009	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.8	1.8	17.2	17.2			BH in good condition. Nothing to report
20.12.2016		BH G017	S		0.43		0.05mØ x 4.00m	1007	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.7	0.7	17.8	17.8	0	0	BH in good condition. Nothing to report
20.12.2016		BH G016	S		3.05		0.05mØ x 9.02m	1004	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.7	20.7	0	0	BH in good condition. Nothing to report
20.12.2016		BH G009	S		5.06		0.05mØ x 9.42m	1004	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.8	0.8	19.7	19.7	0	0	BH in good condition. Nothing to report
20.12.2016		BH G007	S		0.44		0.05mØ x 7.01m	1005	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.5	0.5	15.9	15.9	0	0	BH in good condition. Nothing to report
20.12.2016		BH R004	S		1.71		0.05mØ x 9.89m	1008	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.8	20.8	0	0	BH in good condition. Nothing to report
20.12.2016		BH G015	S		3.57		0.05mØ x 7.98m	1008	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.7	0.7	19.4	19.4	0	0	BH in good condition. Nothing to report
20.12.2016		BH G014	S		2.73		0.05mØ x 10.02m	1007	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.0	1.0	16.9	16.9	0	0	BH in good condition. Nothing to report

20.12.2016		BH G006	S		3.34		0.05mØ x 9.27m	1003	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.1	1.1	17.5	17.5	0	0	BH in good condition. Nothing to report
20.12.2016		BH G001	S		1.79		0.05mØ x 4.03m	1006	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.7	0.7	18.9	18.9	0	0	BH in good condition. Nothing to report
20.12.2016		BH R003	S		0.77		0.05mØ x 12.23m	1005	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.8	20.8	0	0	BH in good condition. Nothing to report
20.12.2016		BH R001s	D		1.99		0.05mØ x 3.07m	1002	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.8	0.8	18.7	18.7	0	0	BH in good condition. Nothing to report
20.12.2016		BH R001d	D		6.98		0.05mØ x 15.12m	1002	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.8	0.8	18.7	18.7	0	0	BH in good condition. Nothing to report
20.12.2016		BH G024	S		7.39		0.05mØ x 10.96m	1002	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.6	0.6	19.6	19.6	0	0	BH in good condition. Nothing to report
20.12.2016		BH RT002	S		0.24		0.05mØ x 7.91m	1002	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.8	20.8	0	0	BH in good condition. Nothing to report
20.12.2016		BH G003	S		0.47		0.05mØ x 9.06m	1002	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.6	1.6	17.1	17.1	0	0	BH in good condition. Nothing to report
20.12.2016		BH RT001	S		3.10		0.05mØ x 10.26m	1010	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.3	0.2	20.5	20.7	0	0	BH in good condition. Nothing to report
20.12.2016		BH A005	S		0.42		0.05mØ x 2.96m	1010	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.2	0.2	16.7	16.7	0	0	BH in good condition. Nothing to report
20.12.2016		BH A004	S		0.73		0.05mØ x 3.10m	1009	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.8	20.8	0	0	BH in good condition. Nothing to report
20.12.2016		BH A003	S		1.23		0.05mØ x 8.60m	1008	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.8	20.8	0	0	BH in good condition. Nothing to report
20.12.2016		BH A001	S		1.48		0.05mØ x 5.52m	1009	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.3	0.3	20.7	20.7	0	0	BH in good condition. Nothing to report
20.12.2016		BH A002	S		0.43		0.05mØ x 2.97m	1009	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.4	0.4	18.3	18.3	0	0	BH in good condition. Nothing to report
20.12.2016		BH A013	S		0.81		0.05mØ x 5.22m	1001	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.7	20.7	0	0	BH in good condition. Nothing to report
20.12.2016		BH A010	S		0.51		0.05mØ x 2.63m	1002	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.3	0.3	20.5	20.5	0	0	BH in good condition. Nothing to report
21.12.2016		BH L010	S		2.58		0.05mØ x 3.85m	1006	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.6	1.6	18.9	18.9	0	0	BH in good condition. Nothing to report
21.12.2016		BH A015	S		0.11		0.05mØ x 5.61m		F	No gas readings. BH flooded																BH in good condition. Nothing to report
21.12.2016		BH L007	S		1.62		0.05mØ x 4.63m	1005	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.6	0.6	19.9	19.9	0	0	BH in good condition. Nothing to report
21.12.2016		BH L009	S		6.35		0.05mØ x 8.64m	1004	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.7	20.7	0	0	BH in good condition. Nothing to report
21.12.2016		BH L008	S		4.25	D	0.05mØ x 4.25m	1004	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	2.6	2.6	13.2	13.2	0	0	BH in good condition. Nothing to report
21.12.2016		BH L003	S		0.79		0.05mØ x 5.23m	1007	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.9	20.9	0	0	BH in good condition. Nothing to report
21.12.2016		BH L001	S		4.13		0.05mØ x 5.67m	1007	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.2	1.2	8.7	8.7	0	0	BH in good condition. Nothing to report
21.12.2016		BH L002	S		0.82		0.05mØ x 3.92m	1007	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.5	0.5	19.9	19.9	0	0	BH in good condition. Nothing to report
21.12.2016		BH G012	S		0.81		0.05mØ x 3.56m	1008	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.7	0.7	19.8	19.8	0	0	BH in good condition. Nothing to report
21.12.2016		BH G010	S		0.77		0.05mØ x 6.53m	1008	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.5	1.5	18.4	18.4	0	0	BH in good condition. Nothing to report
21.12.2016		BH G005	S		3.24		0.05mØ x 5.44m	1004	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.5	1.5	19.3	19.3	0	0	BH in good condition. Nothing to report
21.12.2016		BH RB02	S		2.84		0.05mØ x 6.08m	1006	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	3.8	3.8	13.7	13.7	0	0	BH in good condition. Nothing to report
21.12.2016		WS S01	S		1.85		0.05mØ x 3.81m	1006	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	2.4	2.4	18.6	18.6	0	0	BH in good condition. Nothing to report
21.12.2016		WS S04	S		1.41		0.05mØ x 4.06m	1006	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.9	20.9	0	0	BH in good condition. Nothing to report
21.12.2016		WS S06	S		1.56		0.05mØ x 1.80m	1006	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.9	20.9	0	0	BH in good condition. Nothing to report
21.12.2016		WS S08	S		1.54		0.05mØ x 2.883m	1006	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.6	0.6	20.6	20.6	0	0	BH in good condition. Nothing to report
12.01.2017		BH G019	S		2.62		0.05mØ x 3.94m	991	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.6	1.6	18.6	18.6			BH in good condition. Nothing to report
12.01.2017		BH G017	S		0.42		0.05mØ x 4.00m	989	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.8	0.8	19.1	19.1	0	0	BH in good condition. Nothing to report
12.01.2017		BH G016	S		3.03		0.05mØ x 9.02m	987	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.2	20.2	0	0	BH in good condition. Nothing to report
12.01.2017		BH G009	S		5.03		0.05mØ x 9.42m	987	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	2.1	2.1	18.5	18.5	0	0	BH in good condition. Nothing to report
12.01.2017		BH G007	S		0.40		0.05mØ x 7.01m	988	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.6	0.6	15.7	15.7	0	0	BH in good condition. Nothing to report
12.01.2017		BH R004	S		1.71		0.05mØ x 9.89m	988	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.5	0.5	19.3	19.3	0	0	BH in good condition. Nothing to report
12.01.2017		BH G015	S		3.54		0.05mØ x 7.98m	990	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	19.4	19.4	0	0	BH in good condition. Nothing to report
12.01.2017		BH G014	S		2.53		0.05mØ x 10.02m	989	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.8	1.8	16.0	16.0	0	0	BH in good condition. Nothing to report
12.01.2017		BH G006	S		3.94		0.05mØ x 9.27m	989	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	2.2	2.2	14.3	14.3	0	0	BH in good condition. Nothing to report
12.01.2017		BH G001	S		1.82		0.05mØ x 4.03m	987	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.6	0.6	20.2	20.2	0	0	BH in good condition. Nothing to report
12.01.2017		BH R003	S		0.78		0.05mØ x 12.23m	987	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.9	1.9	18.7	18.7	0	0	BH in good condition. Nothing to report
12.01.2017		BH R001s	D		1.92		0.05mØ x 3.07m	987	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.6	0.6	19.8	19.8	0	0	BH in good condition. Nothing to report
12.01.2017		BH R001d	D		6.95		0.05mØ x 15.12m	987	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	3.0	3.0	14.5	14.5	0	0	BH in good condition. Nothing to report
12.01.2017		BH G024	S		7.36		0.05mØ x 10.96m	988	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.5	0.5	19.9	19.9	0	0	BH in good condition. Nothing to report
12.01.2017		BH RT002	S		0.19		0.05mØ x 7.91m	988	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.8	20.8	0	0	BH in good condition. Nothing to report
12.01.2017		BH G003	S		0.43		0.05mØ x 9.06m	987	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.5	1.5	17.6	17.6	0	0	BH in good condition. Nothing to report
12.01.2017		BH RT001	S		1.32		0.05mØ x 10.26m	991	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.2	0.2	20.4	20.4	0	0	BH in good condition. Nothing to report
12.01.2017		BH A005	S		0.33		0.05mØ x 2.96m	991	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.3	0.3	14.4	14.4	0	0	BH in good condition. Nothing to report
12.01.2017		BH A004	S		0.62		0.05mØ x 3.10m	990	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.7	20.7	0	0	BH in good condition. Nothing to report
12.01.2017		BH A003	S		1.15		0.05mØ x 8.60m	989	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.7	20.7	0	0	BH in good condition. Nothing to report
12.01.2017		BH A001	S		1.38		0.05mØ x 5.52m	989	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.4	0.4	20.2	20.2	0	0	BH in good condition. Nothing to report

12.01.2017		BH A002	S		0.62		0.05mØ x 2.97m	989	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.5	0.5	16.1	16.1	0	0	BH in good condition. Nothing to report
13.01.2017		BH A013	S		0.62		0.05mØ x 5.22m	994	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.3	0.3	20.7	20.7	0	0	BH in good condition. Nothing to report
13.01.2017		BH A010	S		0.45		0.05mØ x 2.63m	990	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.8	20.8	0	0	BH in good condition. Nothing to report
13.01.2017		BH L010	S		2.54		0.05mØ x 3.85m	995	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.6	1.6	19.5	19.5	0	0	BH in good condition. Nothing to report
13.01.2017		BH A015	S		0.08		0.05mØ x 5.61m		S	No gas readings. BH flooded																BH in good condition. Nothing to report
13.01.2017		BH L007	S		1.51		0.05mØ x 4.63m	996	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.7	0.7	20.4	20.4	0	0	BH in good condition. Nothing to report
13.01.2017		BH L009	S		6.37		0.05mØ x 8.64m	995	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.7	20.7	0	0	BH in good condition. Nothing to report
13.01.2017		BH L008	S		4.25	D	0.05mØ x 4.25m	994	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.8	1.8	14.7	14.7	0	0	BH in good condition. Nothing to report
13.01.2017		BH L003	S		0.66		0.05mØ x 5.23m	987	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.8	20.8	0	0	BH in good condition. Nothing to report
13.01.2017		BH L001	S		4.00		0.05mØ x 5.67m	988	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.0	1.0	9.3	9.3	0	0	BH in good condition. Nothing to report
13.01.2017		BH L002	S		0.75		0.05mØ x 3.92m	987	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.5	0.5	20.1	20.1	0	0	BH in good condition. Nothing to report
13.01.2017		BH G012	S		0.74		0.05mØ x 3.56m	988	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.5	0.5	20.4	20.4	0	0	BH in good condition. Nothing to report
13.01.2017		BH G010	S		0.79		0.05mØ x 6.53m	988	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.1	1.1	19.4	19.4	0	0	BH in good condition. Nothing to report
13.01.2017		BH G005	S		3.26		0.05mØ x 5.44m	989	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.9	1.9	19.1	19.1	0	0	BH in good condition. Nothing to report
11.01.2017		BH RB02	S		2.68		0.05mØ x 6.08m	996	F	10.0	3.0	3.0		0.1	0.1	0.1	0.1	1.0	1.0	3.7	3.7	12.4	12.4	0.003	0.111	BH in good condition. Nothing to report
11.01.2017		WS S01	S		1.79		0.05mØ x 3.81m	995	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.4	0.4	20.5	20.5	0	0	BH in good condition. Nothing to report
11.01.2017		WS S04	S		1.32		0.05mØ x 4.06m	994	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.8	20.8	0	0	BH in good condition. Nothing to report
11.01.2017		WS S06	S		1.58		0.05mØ x 1.80m	994	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.8	20.8	0	0	BH in good condition. Nothing to report
11.01.2017		WS S08	S		1.37		0.05mØ x 2.883m	994	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.5	0.5	19.9	19.9	0	0	BH in good condition. Nothing to report
30.01.2017		BH G019	S		2.54		0.05mØ x 3.94m	1000	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.3	1.3	18.9	18.9			BH in good condition. Nothing to report
30.01.2017		BH G017	S		0.34		0.05mØ x 4.00m	996	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.6	0.6	19.5	19.5	0	0	BH in good condition. Nothing to report
30.01.2017		BH G016	S		2.94		0.05mØ x 9.02m	996	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.1	20.1	0	0	BH in good condition. Nothing to report
30.01.2017		BH G009	S		4.95		0.05mØ x 9.42m	997	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.9	1.9	18.8	18.8	0	0	BH in good condition. Nothing to report
30.01.2017		BH G007	S		0.20		0.05mØ x 7.01m	997	S	No gas readings. Sucked up water																BH in good condition. Nothing to report
30.01.2017		BH R004	S		1.69		0.05mØ x 9.89m	996	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.6	0.6	19.3	19.3	0	0	BH in good condition. Nothing to report
30.01.2017		BH G015	S		3.51		0.05mØ x 7.98m	995	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.8	0.8	19.2	19.2	0	0	BH in good condition. Nothing to report
30.01.2017		BH G014	S		2.57		0.05mØ x 10.02m	994	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.6	1.6	16.8	16.8	0	0	BH in good condition. Nothing to report
30.01.2017		BH G006	S		4.24		0.05mØ x 9.27m	994	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.5	1.5	15.7	15.7	0	0	BH in good condition. Nothing to report
30.01.2017		BH G001	S		1.74		0.05mØ x 4.03m	995	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.7	0.7	19.0	19.0	0	0	BH in good condition. Nothing to report
30.01.2017		BH R003	S		0.75		0.05mØ x 12.23m	994	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	2.3	2.3	17.7	17.7	0	0	BH in good condition. Nothing to report
30.01.2017		BH R001s	D		1.90		0.05mØ x 3.07m	994	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.8	0.8	19.1	19.1	0	0	BH in good condition. Nothing to report
30.01.2017		BH R001d	D		6.75		0.05mØ x 15.12m	994	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.5	0.5	19.7	19.7	0	0	BH in good condition. Nothing to report
30.01.2017		BH G024	S		2.27		0.05mØ x 10.96m	1000	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.4	0.4	20.6	20.6	0	0	BH in good condition. Nothing to report
30.01.2017		BH RT002	S		0.08		0.05mØ x 7.91m		S	No gas readings. Sucked up water																BH in good condition. Nothing to report
30.01.2017		BH G003	S		0.30		0.05mØ x 9.06m	1000	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.4	0.4	20.4	20.4	0	0	BH in good condition. Nothing to report
30.01.2017		BH RT001	S		3.02		0.05mØ x 10.26m	1000	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.2	0.2	20.7	20.7	0	0	BH in good condition. Nothing to report
30.01.2017		BH A005	S		0.18		0.05mØ x 2.96m	1000	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.2	0.2	16.2	16.2	0	0	BH in good condition. Nothing to report
30.01.2017		BH A004	S		0.52		0.05mØ x 3.10m	999	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.3	0.3	20.7	20.7	0	0	BH in good condition. Nothing to report
30.01.2017		BH A003	S		1.14		0.05mØ x 8.60m	1000	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.9	20.9	0	0	BH in good condition. Nothing to report
30.01.2017		BH A001	S		1.29		0.05mØ x 5.52m	999	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.4	0.4	19.8	19.8	0	0	BH in good condition. Nothing to report
30.01.2017		BH A002	S		0.32		0.05mØ x 2.97m	999	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.4	0.4	19.7	19.7	0	0	BH in good condition. Nothing to report
31.01.2017		BH A013	S		0.58		0.05mØ x 5.22m	997	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.2	0.2	20.7	20.7	0	0	BH in good condition. Nothing to report
31.01.2017		BH A010	S		0.45		0.05mØ x 2.63m	997	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.8	20.8	0	0	BH in good condition. Nothing to report
31.01.2017		BH L010	S		2.50		0.05mØ x 3.85m	999	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.4	1.4	19.8	19.8	0	0	BH in good condition. Nothing to report
31.01.2017		BH A015	S		0.05		0.05mØ x 5.61m		S	No gas readings. BH flooded																BH in good condition. Nothing to report
31.01.2017		BH L007	S		1.48		0.05mØ x 4.63m	999	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.7	0.7	20.5	20.5	0	0	BH in good condition. Nothing to report
31.01.2017		BH L009	S		6.28		0.05mØ x 8.64m	998	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.7	20.7	0	0	BH in good condition. Nothing to report
31.01.2017		BH L008	S		4.25	D	0.05mØ x 4.25m	998	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.6	1.6	14.9	14.9	0	0	BH in good condition. Nothing to report
31.01.2017		BH L003	S		0.71		0.05mØ x 5.23m	999	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.9	20.9	0	0	BH in good condition. Nothing to report
31.01.2017		BH L001	S		3.71		0.05mØ x 5.67m	999	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.5	1.5	8.7	8.7	0	0	BH in good condition. Nothing to report
31.01.2017		BH L002	S		0.77		0.05mØ x 3.92m	999	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.4	0.4	20.1	20.1	0	0	BH in good condition. Nothing to report
31.01.2017		BH G012	S		0.76		0.05mØ x 3.56m	999	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.5	0.5	20.5	20.5	0	0	BH in good condition. Nothing to report

31.01.2017		BH G010	S		0.76		0.05mØ x 6.53m	999	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.4	1.4	18.6	18.6	0	0	BH in good condition. Nothing to report
31.01.2017		BH G005	S		3.22		0.05mØ x 5.44m	994	S	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.7	1.7	19.3	19.3	0	0	BH in good condition. Nothing to report
27.01.2017		BH RB02	S		2.59		0.05mØ x 6.08m	994	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	4.4	4.4	10.1	10.1	0	0	BH in good condition. Nothing to report
27.01.2017		WS S01	S		1.81		0.05mØ x 3.81m	994	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.5	0.5	20.7	20.7	0	0	BH in good condition. Nothing to report
27.01.2017		WS S04	S		1.32		0.05mØ x 4.06m	993	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.8	20.8	0	0	BH in good condition. Nothing to report
27.01.2017		WS S06	S		1.54		0.05mØ x 1.80m	993	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	0.1	0.1	20.9	20.9	0	0	BH in good condition. Nothing to report
27.01.2017		WS S08	S		1.45		0.05mØ x 2.883m	993	F	0.0	0.0	0.0		0.1	0.1	0.1	0.1	1.0	1.0	1.4	1.4	19.6	19.6	0	0	BH in good condition. Nothing to report

Appendix E

Hydrock Methodology

Hydrock Report Appendix on Hydrock Methodology, version 27 updated 25-01-16 applies to this report.

1.0 HYDROCK REPORT APPENDIX ON HYDROCK METHODOLOGY

This appendix provides additional background information on certain approaches and methods used by Hydrock Consultants Ltd in the preparation of this report.

Throughout the report the term 'geotechnical' is used to describe aspects relating to the physical nature of the site (such as foundation requirements) and the term 'geo-environmental' is used to describe aspects relating to ground-related environmental issues (such as potential contamination). However, it should be appreciated that this is an integrated investigation and these two main aspects are inter-related. The geo-environmental sections are written in broad agreement with BS 10175:2011+A1:2013.

The **first stage** of a two-staged investigation and assessment of a site is the Preliminary Investigation (BS 10175:2011+A1:2013), often referred to as the Phase 1 Study[1], comprising desk study and walk-over survey, which culminates in the Preliminary Risk Assessment. A preliminary conceptual site model (CSM) is developed. From this are identified any geotechnical and geo-environmental hazards and the qualitative degree of risk associated with them. From the geo-environmental perspective, the Hazard Identification process uses professional judgement to evaluate all the hazards in terms of **possible contaminant linkages** (of source-pathway-receptor). Possible contaminant linkages are potentially unacceptable risks in terms of the current contaminated land regime legal framework and require either remediation or further assessment. These are normally addressed via intrusive ground investigation and generic risk assessment.

The **second stage** is the Ground Investigation, Generic Risk Assessment and Geotechnical Interpretation. This represents the further assessment mentioned above. The Ground Investigation comprises field work and laboratory testing based on the findings of the Preliminary Risk Assessment, to reduce uncertainty in the geotechnical and geo-environmental hazard identification. This may include the Exploratory, Main and Supplementary Investigations described in BS 10175:2011+A1:2013.

For the geotechnical aspects of the report, the general requirements of Eurocode 7 (BS EN 1997-2:2007) are to produce a Ground Investigation Report (GIR) which shall form part of the Geotechnical Design Report (GDR). The geotechnical section of this report is intended to fulfil the general requirements of the GIR as outlined in BS EN 1997-2, Section 6.

The GIR contains the factual information including geological features and relevant data, and a geotechnical evaluation of the information stating the assumptions made in the interpretation of the test results.

[1] Please note that it does not refer to a site development phase.

2.0 SITE INVESTIGATION INFORMATION

2.1 Unexploded Ordnance

Clients have a legal duty under the CDM 2015 Regulations to provide designers and contractors with project-specific health and safety information needed to identify hazards and risks. This includes the possibility of unexploded ordnance (UXO) being encountered on the site. Further details are given in CIRIA report C681 (Stone *et al* 2009).

A non-specialist UXO screening exercise has been carried out for the site by considering (a) any evidence of UK defence activities on or near the site evident from the gathered desk study information and (b) the unexploded aerial delivered bomb (UXB) regional risk maps produced by Zetica. Other data sources are available, but as a first stage screening exercise the freely available Zetica maps have been used. The level of risk stated is that determined by Zetica, a company experience in the desk study, field investigation and clearance of UX0/UXB.

2.2 Hydrogeology

Under the Water Framework Directive the designations of principal and secondary aquifers is based on the Environment Agency interactive aquifer designation map. Where aquifers have been mapped, and they are capable of sustaining a yield of 10 m^3/day or supplying 50 people on a continuous basis, the Environment Agency has designated a number of Groundwater Bodies to help manage water quality under the River Basin Management Plans. Groundwater Bodies are defined based on their support for ecosystems as well as their capacity to supply drinking water. Note that some localised small aquifers capable of supporting the above supply may be too small to map and can be identified only by investigation.

Where an aquifer exists and it contains groundwater but is incapable of sustaining the above supply, the groundwater is not part of a Groundwater Body and may not be considered a strategic resource. In which case the groundwater is not a receptor, but can be a pathway to other receptors by virtue of its ability to transport contaminants.

2.3 Geotechnical Testing

Derived values of geotechnical parameters and/or coefficients are obtained from test results, by theory, correlation or empiricism in line with BS EN 1997-2:2007, Section 1.6.

Where derived geotechnical parameters are to be used in designs in accordance with EC7, there are two further stages of interpretation that will be carried out by the geotechnical designer. The first of these is the selection of **characteristic values** for geotechnical parameters using the derived values and complemented by well-established experience as per EN BS 1997-1:2004, Section 2.4.5.2. The characteristic value is a cautious estimate of the value affecting the occurrence of the limit state. Consequently, any particular material type may have more than one characteristic value for each parameter because there may be more than one limit state depending what is being designed.

The second stage is the selection of **design values** as per EN BS 1997-1:2004, Section 2.4.6.2. The design values is either derived from the characteristic value by applying the relevant partial

factor or is assessed directly. Similarly, there can be several design values for the same material type.

In the event that geotechnical designs are included in this report, selection of the characteristic and design values is included. Otherwise, it is the duty of the geotechnical designer to determine these within a separate design report.

3.0 RISK ASSESSMENT RATIONALE

The work presented in this report has been carried out in accordance with recognised best practice as detailed in guidance documents such as in the CLR 11 Model Procedures (Environment Agency 2004a), GP3 (Environment Agency August 2013), BS 5930:2015 and BS 10175:2011+A1:2013. Important aspects of the risk assessment process are transparency and justification. The particular rationale behind the risk assessments presented is given in this appendix.

A preliminary risk assessment is made of both geotechnical and geo-environmental hazards identified at the desk study stage and confirmed (or amended) at the ground investigation stage. In the case of geo-environmental hazards this is based on a simple matrix of probability of occurrence versus the consequence, as explained below, and is referred to as the **exposure model**. In the case of the geotechnical hazard identification, this is referred to as the **ground model**.

The geo-environmental risk assessment process proceeds to the next level, the generic risk assessment, in which actual contaminant concentrations are considered.

3.1 Preliminary Risk Assessment

In line with the CLR 11 Model Procedures (Environment Agency 2004a), the Preliminary Risk Assessment includes a geo-environmental Hazard Identification, which seeks to list all the suspected contaminant **sources**, the **receptors** that might be harmed by those sources and the **pathways** via which the sources might reach the receptors to cause the harm. The source-pathway-receptor concept is known as a contaminant linkage (formerly a pollutant linkage) and only when a linkage is complete is there any possibility of risk of harm arising.

The Hazard Identification process uses professional judgement to evaluate all the hazards in terms of **possible contaminant linkages**. Possible contaminant linkages are potentially unacceptable risks in terms of the current contaminated land regime legal framework and require either remediation or further assessment. These are normally addressed via intrusive ground investigation and the chemical analysis of soil and water samples.

Where no ground investigation has been carried out (i.e. in a desk study only report) there is greater uncertainty in the information available and so a geoenvironmental consequences and probability assessment is undertaken.

Some linkages may be identified which constitute a theoretical connection between a source and a receptor, but professional judgement shows them not to be possible for some reason. These are labelled ‘no linkage’ in the summary table and no further action is required. If a linkage is possible, a comparison is made of consequence against probability in accordance with the guidance given in CIRIA Report C552 (Rudland *et al* 2001), but is modified as mentioned below.

Classification of consequences and probability are given in CIRIA Report C552 Tables 6.3 and 6.4, respectively, but there are a number of inconsistencies in the original Table 6.3, in particular relating to ‘significant harm or significant possibility of significant harm’ (SH/SPOSH). Consequently, the table has been updated by Hydrock in line with current practice and the

revision presented in R&D Publication 66, Annex 4 (NHBC and Environment Agency. 2008, and is given in Table 3.1 below.

The basis of the classification is that 'severe' and 'medium' are likely to result in SH/SPOSH as defined by the EPA 1990, Part 2A, with 'severe' resulting in acute harm. 'Mild' lies below the level of SH/SPOSH but above the level of 'no harm' as implied by the relevant Generic assessment criterion (GAC, see below). Minor lies below the 'no harm' level.

Table 3.1: Classification of Consequences of Geo-environmental Risks

Classification of Consequences for Geo-environmental Risks		
Classification	**Definition**	**Examples**
Severe	Concentration of contaminants is likely to (or is known from previous data to) exceed that indicative of unacceptable intake or contact. Highly elevated concentrations **likely** to result in "significant harm" to human health as defined by the EPA 1990, Part 2A, if exposure occurs. I.e. >>SH/SPOSH, concentrations are high enough to cause acute (short-term) effects. Equivalent to EA **Category 1** pollution incident including persistent and/or extensive effects on water quality; leading to closure of a potable abstraction point; major impact on amenity value or major damage to agriculture or commerce. Major damage to aquatic or other ecosystems, which is likely to result in a substantial adverse change in its functioning or harm to a species of special interest that endangers the long-term maintenance of the population. Catastrophic damage to crops, buildings or property.	Human health: short-term (acute) effects likely to result in significant harm. E.g. high conc. of cyanide on the surface of an informal recreational area. Significant harm to humans is defined as death, disease*, serious injury, genetic mutation, birth defects or the impairment of reproductive functions. Planting: complete and rapid die-back of landscaped areas. Controlled waters: short-term pollution, e.g. major spillage into controlled water. Major fish kill in surface water from large spillage of contaminants from site. Highly elevated concentrations of List I and II substances present in groundwater close to small potable abstraction (high sensitivity). Buildings etc.: catastrophic damage, e.g. explosion causing collapse. (can also equate to immediate human health risk if buildings are occupied). Ecosystems: acute risk to a particular ecosystem or organism forming part of that ecosystem in a designated protected area, e.g. by contamination spillage. Damage to a protected area of international significance (e.g. Ramsar site). Site workers: risk assessment required to determine PPE and this may involve USEPA Level A, B or C protection.

Classification of Consequences for Geo-environmental Risks		
Classification	**Definition**	**Examples**
Medium	Concentration of contaminants is likely to (or is known from previous data to) exceed that indicative of unacceptable intake or contact. Elevated concentrations which could result in "significant harm" to human health as defined by the EPA 1990, Part 2A if exposure occurs. I.e. >SH/SPOSH. Equivalent to **EA Category 2** pollution incident including significant effect on water quality; notification required to abstractors; reduction in amenity value or significant damage to agriculture or commerce. Significant damage to aquatic or other ecosystems, which may result in a substantial adverse change in its functioning or harm to a species of special interest that may endanger the long-term maintenance of the population. Significant damage to crops, buildings or property.	Human health: long-term (chronic) effects likely to result in significant harm. E.g. high conc. of contaminants close to the surface of a development site. Significant harm to humans is defined as death, disease*, serious injury, genetic mutation, birth defects or the impairment of reproductive functions. Planting: stressed or dead plants in landscaped areas. Controlled waters: pollution of sensitive water resources, e.g. leaching into principal or secondary aquifers or rivers. Buildings etc.: damage renders unsafe to occupy e.g. foundation damage resulting in instability. Ingress of contaminants through plastic potable water pipes. Ecosystems: chronic death of species in a particular ecosystem in a designated protected area, e.g. by contamination spillage. Damage to a protected area of national significance (e.g. Site of Special Scientific Interest). Site workers: risk assessment required to determine PPE and this may involve USEPA Level B, C or D protection.
Mild	Concentration of contaminants is likely to (or is known from previous data to) exceed that indicative of no harm but not unacceptable intake or contact. Exposure to human health **unlikely** to lead to "significant harm". I.e. >SVG/GAC but <SH/SPOSH. Equivalent to **EA Category 3** pollution incident including minimal or short lived effect on water quality; marginal effect on amenity value, agriculture or commerce. Minor or short lived damage to aquatic or other ecosystems, which is unlikely to result in a substantial adverse change in its functioning or harm to a species of special interest that would endanger the long-term maintenance of the population. Minor damage to crops, buildings or property.	Human health: harm but probably not significant harm unless particularly sensitive individual within the receptor group. May be aesthetic/olfactory impacts. Exposure could lead to slight short-term effects (e.g. mild skin rash). Planting: damage to plants in landscaped areas, e.g. stunted growth, discoloration. Controlled waters: pollution of non-sensitive water bodies e.g. leaching into non-classified groundwater or minor ditches. Buildings etc.: damage to sensitive buildings etc. Surface spalling of concrete. Ecosystems: minor change in a particular ecosystem in a designated protected area, but not significant harm. Damage to a locally important area. Site workers: risk assessment required to determine PPE and this may involve USEPA Level C or D protection.

Classification of Consequences for Geo-environmental Risks		
Classification	**Definition**	**Examples**
Minor	Concentration of contaminants is likely to (or is known from previous data to) be less than that indicative of no harm. No measurable effects on humans. I.e. <SGV/GAC. Equivalent to insubstantial pollution incident with no observed effect on water quality or ecosystems. Repairable effects of damage to buildings, structures and services.	No measurable effects, but simple PPE required (USEPA Level D protection, i.e. overalls, boots, goggles, hard hat). The loss of plants in a landscaping scheme. Discoloration of concrete.

CIRIA Report C552 Table 6.4 is reproduced as Table 3.2 below. This provides an estimate of the probability that the event described by the contaminant linkage will occur. For example, the likelihood that pollution of groundwater will occur by leaching of metals into the aquifer.

Table 3.2: Classification of Probability of Geo-environmental Risks

Classification of Probability of Geo-environmental Risks	
Classification	**Definition**
High Likelihood	There is a contaminant linkage and an event that either appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution.
Likely	There is a contaminant linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event in not inevitable, but possible in the short term and likely over the long term.
Low Likelihood	There is a contaminant linkage and circumstances are possible under which an event could occur. However, it is no means certain that even over a longer period such event could take place, and is less likely in the shorter term.
Unlikely	There is a contaminant linkage but circumstances are such that it is improbable that an event would occur even in the very long term.

The perceived level of risk for each pathway is then derived from the probability versus consequences matrix, modified after CIRIA Report C552 Table 6.5, given in Table 3.3 below. Note that by definition, no contaminant linkage equates to no risk.

Table 3.3: Qualitative Risk Level from Consequence and Probability

		Consequence			
Probability	*product*	**Severe**	**Medium**	**Mild**	**Minor**
	High Likelihood	Very high risk	High risk	Moderate risk	Low risk
	Likely	High risk	Moderate risk	Low risk	Very low risk
	Low Likelihood	Moderate risk	Low risk	Low risk	Very low risk
	Unlikely	Low risk	Very low risk	Very low risk	Very low risk
	No Linkage	No risk			

This approach assumes an equivalence between probability and consequences and ignores the difficulty that can arise where to probability of occurrence appears to be almost negligible but the consequences are very severe. In such conditions there is a degree of subjectivity in assessing the level of risk and it could be low, moderate or high. Such risks may require specialist consideration beyond the scope of this standard report.

Finally, a description of the classified risks and the likely action required can be determined from Table 3.4 below.

Table 3.4: Description of the Classified Risks and Likely Action Required

Description of Classified Risks and Likely Action Required	
Very High Risk	A significant contaminant linkage, including actual evidence of significant harm or significant possibility and significant harm, is clearly identifiable at the site (e.g. from visual or documentary evidence) under current conditions, with potential for legal and/or financial consequences for the site owner or other Responsible Person. Remediation advisable based on acute impacts being likely. Immediate action should be considered.
High Risk	A contaminant linkage is identifiable at the site under current and future use conditions. Although likely, there is no obvious actual evidence of significant harm or significant possibility and significant harm under current conditions. Extent of risk is therefore subject to confirmation by investigation and risk assessment and most likely to be deemed significant. Realisation of the risk is likely to present a substantial liability to the site owner or other Responsible Person. Remediation required for redevelopment and may also be required under Part 2A for existing receptors.
Moderate Risk	A contaminant linkage is identifiable at the site under current and future use conditions. However, it is not likely to be a significant linkage under current conditions. It is either relatively unlikely that any such harm would be severe, and if any harm were to occur it is more likely, that the harm would be relatively mild. Actual extent of risk subject to confirmation by additional investigation and risk assessment and most likely to lie between no possibility of harm (under current conditions) and significant possibility of significant harm (under conditions created by new use). Remediation may be required for redevelopment.
Low risk	Potential pathways and receptors exist but history of contaminative use or site conditions indicates that contamination is likely to be of limited extent and below the level of no possibility of harm. It is unlikely that the site owner or other Responsible Person would face substantial liabilities from suck a risk. Precautionary investigations and risk assessment advisable on change of use. Any subsequent remedial works are likely to be relatively limited.
Very Low Risk	No contaminant linkage likely to exist under current or future conditions, but this cannot be completely discounted. If harm is realised, it is likely at worst to be mild or minor. Site not capable of being determined under Part 2A where the local authority inspects the site. No further action recommended.
No Risk	No contaminant linkage exists.

3.2 Contaminant Analysis of Samples

The Model Procedures of CLR 11 provide guidance on key information sources with respect to potential contamination arising from past land uses of a site. In particular, the now withdrawn CLR 8 (Environment Agency 2002b), the DoE Industry Profile documents and ISO10381-5 provide good summaries of priority pollutants for UK sites. Additionally, the Environment Agency (2004b) has produced a list of priority pollutants for ecological risk assessment. These documents have been used, with the findings of the Phase 1 investigation, to scope the analyses of chemicals of potential concern. It should be noted that whilst CLR 8 was withdrawn in August 2008 it was not replaced and its findings are still considered useful.

Hydrock considers there to be a minimum requirement for soil chemical analysis, even for greenfield sites, in order to satisfy the 'suitable for use' criterion of the planning regime. This is represented by the 'Hydrock default list of determinands for solids'. The default list is derived

from the above guidance, particularly Tables 2.1 and 2.2 of CLR 8, listing potential inorganic and organic contaminants on typical former **industrial** land in the UK.

Since not all redevelopment sites have former industrial land uses, the default list designed to screen for unacceptable risks to property development and future occupiers comprises those substances with human, vegetation and construction materials receptors. The list includes common metals, metalloids and inorganic species, pH, asbestos fibres and screening tests for common organic compound groups which are deemed chemicals of potential concern. Sulfate is a contaminant whose principal receptor is concrete in the ground and is not considered toxic except in extreme conditions. Sulfate analysis is included in the list of geotechnical tests. Some common determinands such as elemental sulfur and sulfide are not included because there is insufficient information available to calculate meaningful assessment criteria.

The Hydrock default list of determinands for water or soil leaching samples is based on the prevailing UK drinking water standards and the environmental quality standards (EQS) values under the UK's obligations under the European Water Framework Directive (WFD). It includes the most common contaminants for use as a screening exercise but does not represent a complete list.

The two Hydrock default lists of determinands are used as a minimum requirement whatever the findings of the Phase 1 investigation. Added to this may be other suites of determinands based on the findings and review of the aforementioned documents.

Assessment is made of all chemicals of potential concern recorded on the site above the laboratory reporting limit. The reporting limits are less than the generic assessment criteria where this is possible. There are two main reasons why this may not be the case.

Firstly, low-level detection may be available using a more detailed analysis method, but this would be disproportionally expensive for routine screening purposes. More detailed testing may be recommended in some instances as an additional phase of investigation once the results of the screening exercise are known.

Secondly, there may be no suitable laboratory method available. In which case it is impossible to give a definitive opinion.

3.3 Generic Risk Assessment Criteria for Human Health

3.3.1 Policy

Generic assessment criteria (GAC) are criteria derived using largely generic assumptions about the characteristics and behaviour of sources, pathways and receptors. These assumptions will be conservative in a defined range of conditions. The Contaminated Land Exposure Assessment (CLEA) framework uses Soil Guideline Values (SGV) in assessing risks to human health from exposure to soils contaminated with selected contaminants. It has been assumed in this report that the exposure conditions are within the generic conditions used to derive the SGVs.

It should be noted that exceedance of GACs does not automatically mean that the soil is "contaminated". The derivation of GACs includes a number of precautionary assumptions such that non-exceedance will indicate that risk to human health is acceptable and that the land is

suitable for use, with regard to the contaminant in question. SGVs are not binding standards, but may be used to inform judgments about the need for action and the selection of remediation standards or target values for individual sites.

However, the legal test for land contamination under the statutory guidance of Part 2A of the Environment Protection Act 1990 (i.e. "significant harm or significant possibility of significant harm") is **unacceptable** intake or direct bodily contact. Defra (September 2005 and July 2008) has made it clear that exceedance of a GAC does not necessarily meet this legal test, i.e. exceedance of a GAC does not necessarily equate to unacceptable risk. Consequently, the GACs must be considered as screening values only. The situation was clarified by Defra (July 2008) in its guidance on the legal definition of contaminated land and in 2012 by the publication of revised contaminated land statutory guidance. One of the key policy aspects of this revision is to clarify that GACs are only one tool in the decision-making process and that background concentrations and a number of other relevant factors should also be taken into account. The aim is to prevent over-cautious determination of land as being contaminated.

The Environment Agency (2009a) has stated that the Health Criteria Values (HCV) used to derive GACs represent minimal or tolerable risk for long-term human exposure to chemicals in the soil. "Science alone cannot answer the question of whether or not a given *possibility of significant harm* is *significant*, since what is either *significant* or *unacceptable* is a matter of socio-political judgement, and the law entrusts decisions on this to the enforcing authorities (Defra July 2008)."

The former Health Protection Agency (2009) (now Public Health England) also described how HCVs do not represent unacceptable intake and that unacceptable intake is not a toxicological parameter. It further asserts that "unacceptable intake is a policy decision which can only be taken by the local authority." Pointers provided to local authorities in this regard are provided by the following: "The HCVs, and GACs based upon them represent trigger values above which there might be a possibility of significant harm. Whether there is a significant possibility will be linked to factors such as the margin of exceedance, the duration and frequency of exposure, and other site-specific factors."

The 2012 National Planning Policy Framework states that the standard of remediation to be achieved through the grant of planning permission for new development, including permission for land remediation activities, is the removal of unacceptable risk and making sure the site is suitable for its new use. As a minimum, after carrying out the development and commencement of its use, the land should not be capable of being determined as contaminated under Part 2A. The requirements for planning are, therefore, the same as for Part 2A.

The 2012 contaminated land statutory guidance says that GAC represent cautious estimates of levels of contaminants in soil at which there is considered to be no risk to health or, at most, a minimal risk to health. They may be used to indicate when land is very unlikely to pose a significant possibility of significant harm to human health. They should not:

- be used as direct indicators of whether a significant possibility of significant harm to human health may exist. Also, the local authority should not view the degree by which GACs are exceeded (in itself) as being particularly relevant to this consideration, given that the degree of risk posed by land would normally depend on many factors other than simply the amount of contaminants in soil.

- be seen as screening levels which describe the boundary between Categories 3 and 4 (see below);
- be viewed as indicators of levels of contamination above which detailed risk assessment would automatically be required under Part 2A or, under the planning system, in relation to ensuring that land affected by contamination does not meet the Part 2A definition of contaminated land after it has been developed; nor
- be used as generic remediation targets under the Part 2A regime.

Where it is judged that significant uncertainties remain following assessment against generic criteria, there are two options for the developer: either the implementation of an agreed remedial strategy, or to undertake additional testing and/or a detailed quantifiable risk assessment to determine whether remediation is indeed necessary.

Category 4 Screening Levels (C4SL) are criteria developed to screen out land affected by contamination under Part 2A of the EPA 1990 (see Section 3.12 below). They represent a low level of risk, whilst still being protective of human health. The Defra policy document (March 2014) states that "it is anticipated that, where they exist, C4SLs will be used as generic screening criteria that can be used within a GQRA, albeit describing a higher level of risk than the currently or previously available SGVs."

Defra also states that "the Part 2A regime and the planning regime are inter-linked such that the National Planning Policy Framework states that "after development, as a minimum, land should not be capable of being determined as contaminated land under Part 2A of the Environmental Protection Act 1990" and that "Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner." The Part 2A Statutory Guidance and accompanying Impact Assessment were developed on the basis that Category 4 Screening Levels could be used under the planning regime, as they would be in Part 2A investigations directly. The estimated benefits that were expected to accrue from the changes to the Part 2A Statutory Guidance and specifically from the use of the new Category 4 Screening Levels were based on this assumption. However, policy responsibility for the National Planning Policy Framework and associated Planning Practice Guidance falls to the Department for Communities and Local Government."

DCLG's Planning Policy Guidance (Reference ID: 33-007-20140612 Land affected by contamination, dated 12 June 2014) states that "if there is a reason to believe contamination could be an issue, developers should provide proportionate but sufficient site investigation information (a risk assessment) to determine the existence or otherwise of contamination, its nature and extent, the risks it may pose and to whom/what (the 'receptors') so that these risks can be assessed and satisfactorily reduced to an acceptable level. Defra has published a policy companion document considering the use of 'Category 4 Screening Levels' in providing a simple test for deciding when land is suitable for use and definitely not contaminated land."

In a letter to Local Authorities dated 3 September 2014, Defra Parliamentary Under Secretary Lord de Mauley confirmed that the Impact Assessment agreed during the revision of the Part 2A Statutory Guidance was developed on the basis that C4SLs could be used under the planning regime, and noted this intent is reflected in the above-mentioned revision of the Planning Policy Guidance. He highlighted that C4SLs provide a simple test for deciding when land is suitable for use. He concluded that the introduction of C4SLs has an important part to play in the

assessment of potentially contaminated land and encouraged Local Authority officials to read Defra's Policy Companion Document.

The NHBC (October 2014) has endorsed the use of C4SLs in the planning framework. "NHBC considers that:

- C4SLs may be used for schemes in England and Wales as generic screening levels for contaminants in soils, as long as they are justifiable and defensible in the conceptual site model for the site. Where representative contaminant concentrations exceed C4SLs, remediation or further detailed assessment will normally be required.
- Developers should, however, check that the use of C4SLs would be accepted by regulators under the relevant planning regime.
- Where a land use scenario covered by a C4SL applies in England and Wales, that use of C4SLs will satisfy NHBC Standards – Chapter 4.1 requirements. For lead, the C4SL value should be adopted as the screening level, though normal background concentrations can be considered when appropriate."

Public Health England has also communicated with Hydrock on a site-specific basis, confirming (in this instance) that the soil benzo(a)pyrene levels below C4SL not to be of particular concern as long as the Local Authority as the regulator is also satisfied.

On this basis, Hydrock considers the C4SLs to be more pragmatic assessment criteria for use in the planning regime. However, it is recommended that the opinion be sought of the Local Authority in question.

3.3.2 Methodology

The sample analyses are divided into representative data sets for the assessment, based on the conceptual model and taking into account such characteristics as variation in soil properties or historical, existing or proposed land uses. The 'averaging area' is the area of soil to which a receptor is exposed or which otherwise contributes to the creation of hazardous conditions.

The determination of averaging areas is clarified in the CLEA Frequently Asked Questions (30 January 2006) document available from the Agency CLEA web pages. In applying statistical tests, the risk assessor is asking the question "are mean (95 percentile upper confidence limit) soil concentrations within the averaging area equal to, or greater than, the SGV/GAC?" If a garden lies within a larger averaging area, but that averaging area is representative of conditions within the garden, then this is the average concentration a receptor using the garden will be exposed to. An averaging area can, therefore, be larger than a single garden and part of a larger zoned area if:

- contaminant concentrations are within the same statistical population, the sample data being representative of the averaging area and the mean concentration of the averaging area;
- hot spots are treated as separate zones or averaging areas; and
- the sampling strategy takes into account uncertainty (spatial heterogeneity) in contaminant concentration.

The approach taken in this report is to characterize the materials that are likely to form the ground cover in garden areas by zoning the site. Each averaging area has been chosen to describe the area(s) of the site, zoned according to material type and existing conditions, within which assessment against GACs has taken place. As pointed out in P5-066/TR (Environment Agency 2000) and by Nathanail (2004), this is a logical way of investigating a large plot of land that is intended for residential use, particularly if the development layout may not have been finalised.

The original Soil Guideline Values were all withdrawn in August 2008 and the Agency started a programme of publishing replacements using its 'new approach', which involves a number of changes to the way exposure is assessed. This was started using the CLEA 1.04 software. The current version is CLEA 1.07. This programme was put in abeyance when Defra started to re-draft the Part 2A statutory guidance and was never re-started.

This new approach included SGVs only at 6% soil organic matter (SOM) content and none for the residential without plant uptake land use. The contaminated land community has addressed this deficiency by publishing other lists of GACs (EIC/AGS/CL:AIRE 2009 and LQM/CIEH (Nathanail *et al* 2009)) and these have been given equal status to the SGVs in the 2012 revised statutory guidance. Hydrock adopted all these SGVs and GACs and where none are published has derived in-house values using generic assumptions about the characteristics and behaviour of sources, pathways and receptors, the CLEA 1.07 software and research of the recommended data sources.

Since the publication of these lists, CL:AIRE (December 2013) has highlighted that several of the original USEPA data sets used as default input parameters in CLEA have been revised based on a better understanding of the science. These are the outdoor soil-to-skin adherence factor, the exposure frequency for dermal contact, the indoor soil vapour inhalation rates and the produce consumption rates. The first three of these changes are based on updated research in a USEPA 2011 document cited by CL:AIRE. These supersede a draft 2006 USEPA document that was used in the default CLEA model and represent new science. The produce consumption rates used by CL:AIRE are from the most recent National Diet and Nutrition Survey (NSDS) (2008/2009 to 2010/11).

In November 2014 Hydrock used these revised parameters to update all the previously published GACs using modifications to CLEA 1.06. These changes are now built into CLEA 1.07 when the C4SL land uses are selected.

The mean and 90th percentile consumption rates from SP1010 Table 3.4 are used. In the derivation of the C4SLs, CL:AIRE used the 90th percentile consumption rates for the "top two" produce types for each substance and mean consumption rates are used for the remaining produce types (SP1010 Table 3.3). This approach has been followed by Hydrock for the C4SL substances. However, the procedure for determining which are the "top two" is time consuming and has not been replicated by Hydrock for all the other chemicals. The 90th percentile values have been taken for all produce types (and is slightly more conservative).

The GACs adopted by Hydrock for the standard CLEA land uses are given in Table 3.5 together with the source of the GAC. The table also lists GACs for open space (see below).

Please note also that CLEA 1.07 allows for other variations, most notably of soil type (9 options) and building type (5 residential options). The defaults are a sandy loam soil, a small terraced house in the residential setting and a pre-1970s office block in the commercial setting. These are generally conservative and the resultant SGV/GAC are protective of other combinations (unlike the default SOM mentioned above). It is not practical to include all permutations in Table 3.5 and in the cases where specific GACs have been derived, this is referred to in the text of the report and the relevant values included in the assessment tables.

Lead is a special case as the former SGV was not based on the CLEA model, but equations utilising blood lead concentrations. There is currently no guidance on how to risk assess lead in order to produce a GAC. The provisional C4SL for lead was derived using a number approaches, again based on blood lead concentrations, but for three different toxicological effects. The use of biokinetic modelling allows conversion to units suitable for use in the CLEA model. The final C4SLs for residential (with home-ground produce) stipulated in the Defra policy document is less than the withdrawn SGV although the SGV was supposed to represent a lower level of risk. It is clear from the work undertaken to develop the C4SLs why the SGVs were withdrawn. Consequently, and in view of the Defra policy document, Hydrock has adopted the C4SLs for lead *in lieu* of the withdrawn SGV or any specifically derived GAC (which would require a thorough review of lead toxicology). The lead C4SLs are, therefore, included under the term "GACs" in this report.

Further details including data sources can be obtained on request. It is Hydrock's policy to continually review GACs and updates are made in response to the latest Government guidance or as more data on the substances becomes available. The date of the last update of the table is indicated.

Table 3.5: Soil GACs Adopted by Hydrock (mg/kg) - on following pages

Updated 18/11/15		Human Health Generic Assessment Criteria (mg/kg)											
Contaminant	**Source of GAC**	Human health - residential without plant uptake (1%SOM)	Human health - residential without plant uptake (2.5%SOM)	Human health - residential without plant uptake (6%SOM)	Human health - residential with plant uptake (1%SOM)	Human health - residential with plant uptake (2.5%SOM)	Human health - residential with plant uptake (6%SOM)	Human health - allotments (1%SOM)	Human health - allotments (2.5%SOM)	Human health - allotments (6%SOM)	Human health - commercial (1%SOM)	Human health - commercial (2.5%SOM)	Human health - commercial (6%SOM)
							Default for SGV			Default for SGV			Default for SGV
Hydrock Default Suite													
Arsenic	SGV report + CLEA 1.07	40	40	40	37	37	37	49	49	49	640	640	640
Beryllium	LQM/CIEH + CLEA 1.07	73	73	73	73	73	73	56	56	56	390	390	390
Boron	LQM/CIEH + CLEA 1.07	11000	11000	11000	300	300	300	47	47	47	190000	190000	190000
Cadmium	SGV report + CLEA 1.07	87	87	87	14	14	14	2.4	2.4	2.4	220	220	220
Chromium (III)	LQM/CIEH + CLEA 1.07	890	890	890	890	890	890	15000	15000	15000	8400	8400	8400
Chromium (VI)	LQM/CIEH + CLEA 1.07	6.1	6.1	6.1	6.1	6.1	6.1	2.3	2.3	2.3	33	33	33
Copper	LQM/CIEH + CLEA 1.07	7300	7300	7300	2500	2500	2500	540	540	540	69000	69000	69000
Lead	C4SL (NB not minimal risk)	310	310	310	200	200	200	80	80	80	2300	2300	2300
Mercury, inorganic	SGV report + CLEA 1.07	240	240	240	170	170	170	81	81	81	3600	3600	3600
Nickel	Hydrock + CLEA 1.07	180	180	180	130	130	130	55	55	55	1700	1700	1700
Selenium	SGV report + CLEA 1.07	600	600	600	360	360	360	130	130	130	13000	13000	13000
Vanadium	LQM/CIEH + CLEA 1.07	1200	1200	1200	410	410	410	94	94	94	9000	9000	9000
Zinc	LQM/CIEH + CLEA 1.07	40000	40000	40000	3900	3900	3900	640	640	640	670000	670000	670000
Cyanide (free)	Hydrock + CLEA 1.07	800	800	800	790	790	790	2300	2300	2300	16000	16000	16000
Phenol	SGV report + CLEA 1.07	750	1300	2300	290	560	1100	69	140	290	760	1500	3200
Acenaphthene	LQM/CIEH + CLEA 1.07	3000	4700	6000	220	520	1100	35	95	210	84000	97000	100000
Acenaphthylene	LQM/CIEH + CLEA 1.07	2900	4600	6000	180	430	940	29	71	170	83000	97000	100000
Anthracene	LQM/CIEH + CLEA 1.07	31000	35000	37000	2400	5500	11000	390	940	2300	520000	540000	540000
Benz(a)anthracene	LQM/CIEH + CLEA 1.07	5.5	7.8	9.4	4.2	6.7	8.6	2.5	5.4	10	86	91	94
Benzo(a)pyrene	LQM/CIEH + CLEA 1.07	1.5	1.6	1.6	1.50	1.50	1.5	2.10	2.2	2.4	14	14	14
Benzo(b)fluoranthene	LQM/CIEH + CLEA 1.07	11.0	11.0	11.0	7.6	9.4	10.0	3.5	7.3	13	97	98	99
Benzo(ghi)perylene	LQM/CIEH + CLEA 1.07	71	72	72	64	69	71	69	110	150	630	640	640
Benzo(k)fluoranthene	LQM/CIEH + CLEA 1.07	15	16	16	12.0	14.0	15	6.7	13	23	140	140	140
Chrysene	LQM/CIEH + CLEA 1.07	13.0	16.0	15	7.7	11.0	13.0	2.6	5.8	12	140	140	140
Dibenz(ah)anthracene	LQM/CIEH + CLEA 1.07	1.30	1.40	1.40	1.10	1.30	1.40	0.75	1.4	2.3	12	12	13
Fluoranthene	LQM/CIEH + CLEA 1.07	1500	1600	1600	290	560	900	52	130	290	23000	23000	23000
Fluorene	LQM/CIEH + CLEA 1.07	2800	3800	4500	170	410	880	28	68	160	63000	68000	71000
Indeno(123cd)pyrene	LQM/CIEH + CLEA 1.07	6.3	6.6	6.7	4.3	5.5	6.2	1.8	3.8	7.1	58	59	60
Naphthalene	LQM/CIEH + CLEA 1.07	2.3	5.6	13.0	2.2	5.2	12.0	4.2	10	24	190	460	1100
Phenanthrene	LQM/CIEH + CLEA 1.07	1300	1500	1500	97	220	440	16	39	92	22000	22000	23000
Pyrene	LQM/CIEH + CLEA 1.07	3700	3800	3800	620	1200	2000	110	270	620	54000	54000	55000
TPH fractions													
TPH ali EC05-EC06	LQM/CIEH + CLEA 1.07	42	78	160	42	78	160	760	1800	4000	300	560	1200
TPH ali >EC06-EC08	LQM/CIEH + CLEA 1.07	100	230	530	100	230	530	2400	5700	13000	140	320	740
TPH ali >EC08-EC10	LQM/CIEH + CLEA 1.07	27	65	160	27	65	150	320	760	1700	78	190	450
TPH ali >EC10-EC12	LQM/CIEH + CLEA 1.07	48	120	280	48	120	280	2100	4200	7000	48	120	280
TPH ali >EC12-EC16	LQM/CIEH + CLEA 1.07	24	59	140	24	59	140	11000	13000	13000	24	59	140
TPH ali >EC16-EC35	LQM/CIEH + CLEA 1.07	65000	93000	110000	65000	92000	110000	260000	270000	270000	1000000	1000000	1000000
TPH ali >EC35-EC44	LQM/CIEH + CLEA 1.07	65000	93000	110000	65000	92000	110000	260000	270000	270000	1000000	1000000	1000000
TPH aro EC05-EC07	LQM/CIEH + CLEA 1.07	370	690	1400	73	150	310	14	28	60	1200	2300	4700
TPH aro >EC07-EC08	LQM/CIEH + CLEA 1.07	860	1800	3900	130	300	680	23	53	120	870	1900	4400
TPH aro >EC08-EC10	LQM/CIEH + CLEA 1.07	47	120	270	35	84	190	8.9	22	52	610	1500	3600
TPH aro >EC10-EC12	LQM/CIEH + CLEA 1.07	250	590	1200	75	180	390	13	32	76	360	900	2200
TPH aro >EC12-EC16	LQM/CIEH + CLEA 1.07	1800	2300	2500	150	330	670	23	58	140	36000	37000	38000
TPH aro >EC16-EC21	LQM/CIEH + CLEA 1.07	1900	1900	1900	260	550	930	46	110	260	28000	28000	28000
TPH aro >EC21-EC35	LQM/CIEH + CLEA 1.07	1900	1900	1900	1100	1500	1700	360	790	1500	28000	28000	28000
TPH aro >EC35-EC44	LQM/CIEH + CLEA 1.07	1900	1900	1900	1100	1500	1700	360	790	1500	28000	28000	28000
TPH >EC44-EC70	LQM/CIEH + CLEA 1.07	1900	1900	1900	1600	1800	1900	1100	2000	2900	28000	28000	28000
VOCs - BTEX & MTBE													
Benzene	SGV report + CLEA 1.07	0.38	0.70	1.4	0.099	0.2	0.42	0.02	0.041	0.09	27	48	90
Toluene	SGV report + CLEA 1.07	860	1800	3900	130	300	680	23	53	120	870	1900	4400
Ethylbenzene	SGV report + CLEA 1.07	240	540	1200	76	180	410	17	40	94	520	1200	2800
Xylene, o-	SGV report + CLEA 1.07	85	200	460	59	140	320	29	70	160	480	1100	2600
Xylene, m-	SGV report + CLEA 1.07	79	190	430	58	140	320	32	77	180	630	1500	3500
Xylene, p- (use this for combined m & p)	SGV report + CLEA 1.07	76	180	410	55	130	300	30	72	170	580	1400	3200
MTBE	EIC/AGS/CL:AIRE + CLEA 1.07	100	170	320	62	110	210	23	45	92	7500	12000	27000
VOCs - other benzenes													
Iso-propylbenzene	EIC/AGS/CL:AIRE + CLEA 1.07	17	40	95	15	38	89	33	81	190	390	950	2300
Propylbenzene	EIC/AGS/CL:AIRE + CLEA 1.07	57	140	320	46	110	260	35	86	200	400	980	2300
1,2,4-Trimethylbenzene	EIC/AGS/CL:AIRE + CLEA 1.07	0.58	1.4	3.3	0.47	1.2	2.7	0.39	0.96	2.3	39	94	210

Updated 18/11/15		Human Health Generic Assessment Criteria (mg/kg)											
Contaminant	**Source of GAC**	Human health - residential without plant uptake (1%SOM)	Human health - residential without plant uptake (2.5%SOM)	Human health - residential without plant uptake (6%SOM)	Human health - residential with plant uptake (1%SOM)	Human health - residential with plant uptake (2.5%SOM)	Human health - residential with plant uptake (6%SOM)	Human health - allotments (1%SOM)	Human health - allotments (2.5%SOM)	Human health - allotments (6%SOM)	Human health - commercial (1%SOM)	Human health - commercial (2.5%SOM)	Human health - commercial (6%SOM)
VOCs - chlorobenzenes													
Bromobenzene	EIC/AGS/CL:AIRE + CLEA 1.07	1.3	3	7	1.2	2.8	6.6	3.3	7.9	18	92	210	490
Chlorobenzene	LQM/CIEH + CLEA 1.07	0.47	1.1	2.4	0.46	1.0	2.4	6.1	14	33	56	130	290
1,2-Dichlorobenzene	LQM/CIEH + CLEA 1.07	24	57	130	23	55	130	97	240	560	570	1400	3200
1,3-Dichlorobenzene	LQM/CIEH + CLEA 1.07	0.44	1.1	2.5	0.41	0.98	2.3	0.26	0.63	1.5	30	73	170
1,4-Dichlorobenzene	LQM/CIEH + CLEA 1.07	60	140	330	38	92	220	16	38	91	230	540	1300
Hexachlorobenzene	LQM/CIEH + CLEA 1.07	0.20	0.50	2.5	0.20	0.50	1.9	0.17	0.42	0.91	0.2	53	55
Pentachlorobenzene	LQM/CIEH + CLEA 1.07	20	30	38	5.9	12	22	1.3	3.1	7.1	640	770	830
1,2,3-trichlorobenzene	LQM/CIEH + CLEA 1.07	1.5	3.7	8.8	1.5	3.6	8.6	4.8	12	28	100	250	590
1,2,4-trichlorobenzene	LQM/CIEH + CLEA 1.07	2.6	3.4	15	2.6	6.4	15	31	77	180	220	530	1300
1,3,5-trichlorobenzene	LQM/CIEH + CLEA 1.07	0.33	0.81	1.9	0.33	0.81	1.9	4.9	12	28	23	55	130
1,2,3,4-tetrachlorobenzene	LQM/CIEH + CLEA 1.07	24	56	120	15	36	78	4.5	11	26	120	300	730
1,2,3,5-tetrachlorobenzene	LQM/CIEH + CLEA 1.07	0.75	1.9	4.3	0.67	1.6	3.7	0.39	0.95	2.2	39	98	240
1,2,4,5-tetrachlorobenzene	LQM/CIEH + CLEA 1.07	0.73	1.7	3.5	0.34	0.78	1.6	0.065	0.16	0.38	20	49	96
VOCs - chloroalkanes & alkanes													
Bromodichloromethane	EIC/AGS/CL:AIRE + CLEA 1.07	0.027	0.049	0.10	0.022	0.040	0.082	0.017	0.033	0.070	2.0	3.5	7.1
Bromoform	EIC/AGS/CL:AIRE + CLEA 1.07	7.4	15	32	3.5	7.3	16	0.98	2.1	4.8	710	1400	3000
Chloroethane	EIC/AGS/CL:AIRE + CLEA 1.07	12	16	26	12	16	26	120	210	390	900	1200	2000
Chloroethene (aka vinyl chloride)	LQM/CIEH + CLEA 1.07	0.00077	0.0010	0.0015	0.00064	0.00087	0.0014	0.00057	0.0010	0.0019	0.059	0.077	0.12
Chloromethane	EIC/AGS/CL:AIRE + CLEA 1.07	0.012	0.014	0.019	0.012	0.014	0.019	0.068	0.13	0.24	1.0	1.1	1.5
1,1-Dichloroethane	EIC/AGS/CL:AIRE + CLEA 1.07	3.6	5.8	11	3.4	5.5	11	9.6	18	37	260	430	800
1,2-Dichloroethane	LQM/CIEH + CLEA 1.07	0.0092	0.013	0.023	0.0071	0.011	0.019	0.0048	0.0086	0.016	0.67	0.97	1.7
1,1-Dichloroethene	EIC/AGS/CL:AIRE + CLEA 1.07	0.33	0.58	1.2	0.32	0.57	1.2	2.9	5.8	12	24	43	87
Cis 1,2 Dichloroethene	EIC/AGS/CL:AIRE + CLEA 1.07	0.17	0.29	0.56	0.16	0.27	0.52	0.27	0.52	1.1	14	23	44
Trans 1,2 Dichloroethene	EIC/AGS/CL:AIRE + CLEA 1.07	0.28	0.50	1.0	0.27	0.48	0.98	0.97	1.9	4.2	21	37	76
Dichloromethane	EIC/AGS/CL:AIRE + CLEA 1.07	3.0	4.0	6.4	0.62	1.1	1.9	0.11	0.19	0.35	260	340	530
1,2-Dichloropropane	EIC/AGS/CL:AIRE + CLEA 1.07	0.034	0.06	0.12	0.034	0.060	0.12	0.64	1.3	2.7	3.1	5.5	11
Hexachloroethane	EIC/AGS/CL:AIRE + CLEA 1.07	0.31	0.77	1.8	0.27	0.66	1.6	0.28	0.069	1.6	8.2	20	48
Tetrachloroethene	LQM/CIEH + CLEA 1.07	1.5	3.3	7.5	1.3	2.9	6.7	1.7	3.9	9.0	120	280	620
1,1,1,2-Tetrachloroethane	LQM/CIEH + CLEA 1.07	1.5	3.6	8.2	1.2	2.8	6.5	0.82	1.9	4.6	110	250	560
1,1,2,2-Tetrachloroethane	LQM/CIEH + CLEA 1.07	4.1	8.3	18	1.7	3.5	7.8	0.42	0.92	2.1	280	560	1200
Tetrachloromethane	LQM/CIEH + CLEA 1.07	0.026	0.056	0.13	0.026	0.056	0.13	0.17	0.38	0.88	2.9	6.3	14
Trichloroethene	LQM/CIEH + CLEA 1.07	0.16	0.33	0.73	0.15	0.31	0.69	0.44	0.99	2.2	11	24	52
1,1,1-Trichloroethane	LQM/CIEH + CLEA 1.07	9.0	18	40	8.8	18	39	50	110	250	660	1400	3000
1,1,2 Trichloroethane	EIC/AGS/CL:AIRE + CLEA 1.07	1.3	2.5	5.5	0.76	1.6	3.5	0.29	0.64	1.4	89	180	380
Trichloromethane	LQM/CIEH + CLEA 1.07	1.3	2.3	4.6	0.98	1.8	3.6	0.37	0.73	1.5	100	180	350
Other phenols & chlorophenols													
2-Chlorophenol	LQM/CIEH + CLEA 1.07	110	170	220	3.9	9.1	20	0.60	1.4	3.4	3600	4000	4300
2,4-Dichlorophenol	LQM/CIEH + CLEA 1.07	94	150	200	0.91	2.1	4.7	0.14	0.31	0.72	3500	3900	4200
2,4-Dimethylphenol	EIC/AGS/CL:AIRE + CLEA 1.07	300	590	1000	20	46	100	3.2	7.4	17	1400	3100	7200
2-Methylphenol	EIC/AGS/CL:AIRE + CLEA 1.07	5300	7700	9900	85	190	430	13	29	67	160000	180000	180000
3-Methylphenol	EIC/AGS/CL:AIRE + CLEA 1.07	6800	9100	11000	85	190	420	13	29	65	170000	180000	190000
4-Methylphenol	EIC/AGS/CL:AIRE + CLEA 1.07	5400	7900	10000	84	190	420	13	29	65	160000	180000	180000
Pentachlorophenol	LQM/CIEH + CLEA 1.07	37	56	69	0.56	1.3	3.1	0.085	0.21	0.49	1200	1300	1400
2,3,4,6-Tetrachlorophenol	LQM/CIEH + CLEA 1.07	140	200	240	0.89	2.1	4.8	0.14	0.32	0.74	3900	4200	4300
2,4,6-Trichlorophenol	LQM/CIEH + CLEA 1.07	140	200	250	1.5	3.5	7.8	0.22	0.53	1.2	3900	4200	4400
Phthalates													
Bis (2-ethylhexyl) phthalate	EIC/AGS/CL:AIRE + CLEA 1.07	3900	4000	4100	290	660	1300	48	120	280	85000	86000	86000
Butyl benzyl phthalate	EIC/AGS/CL:AIRE + CLEA 1.07	61000	63000	64000	1500	3500	7800	230	560	1300	940000	940000	950000
Diethyl Phthalate	EIC/AGS/CL:AIRE + CLEA 1.07	14	29	65	120	270	610	19	43	98	14	29	65
Di-n-butyl phthalate	EIC/AGS/CL:AIRE + CLEA 1.07	650	650	650	13	32	72	2.1	5.1	12	15000	15000	15000
Di-n-octyl phthalate	EIC/AGS/CL:AIRE + CLEA 1.07	4900	4900	4900	2800	3800	4300	920	2000	3900	89000	89000	89000
Pesticides													
Aldrin	LQM/CIEH + CLEA 1.07	3.0	3.1	3.1	2.3	2.7	2.9	1.3	2.5	4.0	54	54	54
Atrazine	LQM/CIEH + CLEA 1.07	45	46	46	0.25	0.58	1.3	0.038	0.089	0.21	870	880	880
DDD	Hydrock + CLEA 1.07	1300	1300	1300	910	1100	1200	400	780	1200	22000	22000	22000
DDE	Hydrock + CLEA 1.07	1300	1300	1300	870	1100	1200	360	740	1300	22000	22000	22000
DDT	Hydrock + CLEA 1.07	1300	1300	1300	830	1000	1200	320	650	1100	21000	21000	21000
Dichlorvos	LQM/CIEH + CLEA 1.07	36	45	53	0.30	0.62	1.3	0.046	0.094	0.20	840	870	890
Dieldrin	LQM/CIEH + CLEA 1.07	5.0	5.4	5.6	0.74	1.5	2.7	0.13	0.32	0.74	90	91	92
Endosulfan - alpha	LQM/CIEH + CLEA 1.07	62	110	160	3.1	7.4	17	0.49	1.2	2.8	2300	3000	3400
Endosulfan - beta	LQM/CIEH + CLEA 1.07	76	130	180	2.9	7.0	16	0.46	1.1	2.6	2500	3100	3500
Hexachlorocyclohexanes - alpha (inc. Lindane)	LQM/CIEH + CLEA 1.07	660	840	940	20	48	110	3.1	7.7	18	14000	15000	15000
Hexachlorocyclohexanes - beta (inc. Lindane)	LQM/CIEH + CLEA 1.07	73	75	76	1.7	4.1	9.2	0.27	0.66	1.6	1100	1100	1100
Hexachlorocyclohexanes - gamma (inc. Lindane)	LQM/CIEH + CLEA 1.07	27	31	33	0.60	1.4	3.3	0.092	0.23	0.54	530	550	550

Updated 18/11/15		Human Health Generic Assessment Criteria (mg/kg)											
Contaminant	**Source of GAC**	**Human health - residential without plant uptake (1%SOM)**	**Human health - residential without plant uptake (2.5%SOM)**	**Human health - residential without plant uptake (6%SOM)**	**Human health - residential with plant uptake (1%SOM)**	**Human health - residential with plant uptake (2.5%SOM)**	**Human health - residential with plant uptake (6%SOM)**	**Human health - allotments (1%SOM)**	**Human health - allotments (2.5%SOM)**	**Human health - allotments (6%SOM)**	**Human health - commercial (1%SOM)**	**Human health - commercial (2.5%SOM)**	**Human health - commercial (6%SOM)**
Dioxins, furans & dioxin-like-PCBs													
Total dioxins, furans & DL-PCB (aerial dep.)	SGV report + CLEA 1.07	0.012	0.012	0.012	0.0099	0.010	0.010	0.0075	0.0083	0.0086	0.24	0.24	0.24
Non-dioxin-like PCBs													
PCB-28	Hydrock + CLEA 1.07	0.63	0.63	0.63	0.24	0.37	0.47	0.056	0.12	0.22	9.0	9.0	9.0
PCB-52	Hydrock + CLEA 1.07	0.63	0.63	0.63	0.24	0.38	0.49	0.058	0.13	0.26	9.0	9.0	9.0
PCB-101	Hydrock + CLEA 1.07	0.63	0.63	0.63	0.50	0.57	0.60	0.290	0.52	0.74	9.0	9.0	9.0
PCB-138	Hydrock + CLEA 1.07	0.63	0.63	0.63	0.54	0.59	0.61	0.39	0.65	0.88	9.0	9.0	9.0
PCB-153	Hydrock + CLEA 1.07	0.63	0.63	0.63	0.56	0.60	0.61	0.49	0.75	0.95	9.0	9.0	9.0
PCB-180	Hydrock + CLEA 1.07	0.63	0.63	0.63	0.58	0.61	0.62	0.58	0.85	1.0	9.0	9.0	9.0
Explosives													
HMX	LQM/CIEH + CLEA 1.07	6700	6700	6700	5.9	13	27	0.89	2.0	4.0	110000	110000	110000
RDX	LQM/CIEH + CLEA 1.07	400	400	400	3.5	7.6	17	0.54	1.2	2.6	6400	6400	6400
2,4,6-Trinitrotoluene	LQM/CIEH + CLEA 1.07	65	65	66	1.6	3.8	8.4	0.25	0.61	1.4	1000	1000	1100
Other inorganics													
Antimony	EIC/AGS/CL:AIRE + CLEA 1.07	380	380	380	190	190	190	54	54	54	6600	6600	6600
Barium	EIC/AGS/CL:AIRE + CLEA 1.07	1400	1400	1400	790	790	790	270	270	270	22000	22000	22000
Mercury, elemental	SGV report + CLEA 1.07	0.24	0.60	1.5	0.24	0.60	1.5	4.3	11	26	4.3	11	26
Molybdenum	EIC/AGS/CL:AIRE + CLEA 1.07	670	670	670	250	250	250	59	59	59	18000	18000	18000
Thiocyanate	Hydrock + CLEA 1.07	13	13	13	13	13	13	28	28	28	190	190	190
Other organics													
Biphenyl	EIC/AGS/CL:AIRE + CLEA 1.07	34	84	200	34	84	200	15	36	86	34	84	200
Carbon disulphide	LQM/CIEH + CLEA 1.07	0.14	0.29	0.62	0.14	0.29	0.62	5.0	11	24	11	22	47
2,4-Dinitrotoluene	EIC/AGS/CL:AIRE + CLEA 1.07	240	250	250	1.5	3.4	7.6	0.23	0.51	1.2	3700	3800	3800
2,6-Dinitrotoluene	EIC/AGS/CL:AIRE + CLEA 1.07	110	120	130	0.82	1.8	4.1	0.12	0.28	0.63	1900	1900	1900
Hexachloro-1,3-butadiene	LQM/CIEH + CLEA 1.07	0.32	0.78	1.8	0.29	0.70	1.6	0.25	0.62	1.4	31	66	120
Mercury, methyl	SGV report + CLEA 1.07	12	16	20	10	13	15	8.0	8.0	8.0	370	390	410
Styrene	EIC/AGS/CL:AIRE + CLEA 1.07	52	120	280	11	25	58	1.6	3.9	9.1	630	1400	3400
Tributyl tin oxide	EIC/AGS/CL:AIRE + CLEA 1.07	12	14	15	0.28	0.67	1.5	0.040	0.11	0.25	230	230	240
2-Chloronaphthalene	EIC/AGS/CL:AIRE + CLEA 1.07	5.4	13	32	5.3	13	31	42	100	230	370	900	2100
Insufficient data to derive GAC													
n butylbenzene	Insufficient data (EIC)	-	-	-	-	-	-	-	-	-	-	-	-
sec butylbenzene	Insufficient data (EIC)	-	-	-	-	-	-	-	-	-	-	-	-
Carbazole	Insufficient data (EIC)	-	-	-	-	-	-	-	-	-	-	-	-
Dimethyl phthalate	Insufficient data (EIC)	-	-	-	-	-	-	-	-	-	-	-	-
Isopropyltoluene	Insufficient data (EIC)	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	Insufficient data (EIC)	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	Insufficient data (EIC)	-	-	-	-	-	-	-	-	-	-	-	-
Sulfur (elemental)	Insufficient data (Hydrock)	-	-	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	Insufficient data (EIC)	-	-	-	-	-	-	-	-	-	-	-	-
tert butylbenzene	Insufficient data (EIC)	-	-	-	-	-	-	-	-	-	-	-	-
NOTES													
If >1,000,000 is calculated, 1,000,000 is adopted.													
Red text - liquid at ambient temperature, calculated GAC exceeds saturation value and highlighed in red in CLEA - saturation value adopted for GAC													
Orange text - solid at ambient temperature, calculated GAC exceeds saturation value and highlighted red in CLEA - manual calculation not possible as only one HCV - saturated vapour concentration exceed, so saturation value adopted for GAC.													
Blue text - solid at ambient temperature, calculated GAC exceeds saturation value and highlighted red in CLEA - manual calculation not possible as only one HCV - aqueous solubility exceed, so original red-highlighted value adopted for GAC.													
Green text - solid at ambient temperature, calculated GAC exceeds saturation value and highlighted red in CLEA - manual calculation undertaken but result is greater than original red-highlighted value, so original red-highlighted value adopted for GAC.													

Updated 18/11/15							
Contaminant	**Source of GAC**	**Human health - POSresi (1%SOM)**	**Human health - POSresi (2.5%SOM)**	**Human health - POSresi (6%SOM)**	**Human health - POSpark (1%SOM)**	**Human health - POSpark (2.5%SOM)**	**Human health - POSpark (6%SOM)**
Hydrock Default Suite							
Arsenic	SGV report + CLEA 1.07	79	79	79	170	170	170
Beryllium	LQM/CIEH + CLEA 1.07	92	92	92	670	670	670
Boron	LQM/CIEH + CLEA 1.07	21000	21000	21000	46000	46000	46000
Cadmium	SGV report + CLEA 1.07	120	120	120	560	560	560
Chromium (III)	LQM/CIEH + CLEA 1.07	1500	1500	1500	27000	27000	27000
Chromium (VI)	LQM/CIEH + CLEA 1.07	7.7	7.7	7.7	220	220	220
Copper	LQM/CIEH + CLEA 1.07	12000	12000	12000	44000	44000	44000
Lead	C4SL (NB not minimal risk)	630	630	630	1300	1300	1300
Mercury, inorganic	SGV report + CLEA 1.07	470	470	470	1100	1100	1100
Nickel	Hydrock + CLEA 1.07	290	290	290	800	800	800
Selenium	SGV report + CLEA 1.07	1400	1400	1400	2600	2600	2600
Vanadium	LQM/CIEH + CLEA 1.07	2000	2000	2000	5000	5000	5000
Zinc	LQM/CIEH + CLEA 1.07	81000	81000	81000	170000	170000	170000
Cyanide (free)	Hydrock + CLEA 1.07	1600	1600	1600	3400	3400	3400
Phenol	SGV report + CLEA 1.07	760	1500	3200	760	1500	3200
Acenaphthene	LQM/CIEH + CLEA 1.07	15000	15000	15000	29000	30000	30000
Acenaphthylene	LQM/CIEH + CLEA 1.07	15000	15000	15000	29000	30000	30000
Anthracene	LQM/CIEH + CLEA 1.07	74000	74000	74000	150000	150000	150000
Benz(a)anthracene	LQM/CIEH + CLEA 1.07	17	18	18	26	33	40
Benzo(a)pyrene	LQM/CIEH + CLEA 1.07	2.6	2.6	2.6	4.5	5.6	6.5
Benzo(b)fluoranthene	LQM/CIEH + CLEA 1.07	18	18	18	30	38	45
Benzo(ghi)perylene	LQM/CIEH + CLEA 1.07	120	120	120	270	310	350
Benzo(k)fluoranthene	LQM/CIEH + CLEA 1.07	26	26	26	46	57	67
Chrysene	LQM/CIEH + CLEA 1.07	25	26	26	34	45	55
Dibenz(ah)anthracene	LQM/CIEH + CLEA 1.07	2.3	2.3	2.3	4.5	5.5	6.3
Fluoranthene	LQM/CIEH + CLEA 1.07	3100	3100	3100	6300	6300	6400
Fluorene	LQM/CIEH + CLEA 1.07	9900	9900	9900	20000	20000	20000
Indeno(123cd)pyrene	LQM/CIEH + CLEA 1.07	11	11	11	17	22	26
Naphthalene	LQM/CIEH + CLEA 1.07	3900	4100	4200	1100	1600	2300
Phenanthrene	LQM/CIEH + CLEA 1.07	3100	3100	3100	6200	6300	6300
Pyrene	LQM/CIEH + CLEA 1.07	7400	7400	7400	15000	15000	15000
TPH fractions							
TPH ali EC05-EC06	LQM/CIEH + CLEA 1.07	300	590000	600000	300	560	1200
TPH ali >EC06-EC08	LQM/CIEH + CLEA 1.07	600000	610000	620000	140	320	740
TPH ali >EC08-EC10	LQM/CIEH + CLEA 1.07	13000	13000	13000	77	190	450
TPH ali >EC10-EC12	LQM/CIEH + CLEA 1.07	13000	13000	13000	48	120	280
TPH ali >EC12-EC16	LQM/CIEH + CLEA 1.07	13000	13000	13000	24	59	140
TPH ali >EC16-EC35	LQM/CIEH + CLEA 1.07	250000	250000	250000	460000	480000	490000
TPH ali >EC35-EC44	LQM/CIEH + CLEA 1.07	250000	250000	250000	460000	480000	490000
TPH aro EC05-EC07	LQM/CIEH + CLEA 1.07	56000	56000	56000	1200	2300	4700
TPH aro >EC07-EC08	LQM/CIEH + CLEA 1.07	56000	56000	56000	870	1900	4400
TPH aro >EC08-EC10	LQM/CIEH + CLEA 1.07	5000	5000	5000	610	1500	3600
TPH aro >EC10-EC12	LQM/CIEH + CLEA 1.07	5000	5000	5000	360	900	10000
TPH aro >EC12-EC16	LQM/CIEH + CLEA 1.07	5000	5000	5000	10000	10000	10000
TPH aro >EC16-EC21	LQM/CIEH + CLEA 1.07	3800	3800	3800	7600	7700	7800
TPH aro >EC21-EC35	LQM/CIEH + CLEA 1.07	3800	3800	3800	7800	7800	7900
TPH aro >EC35-EC44	LQM/CIEH + CLEA 1.07	3800	3800	3800	7800	7800	7900
TPH >EC44-EC70	LQM/CIEH + CLEA 1.07	3800	3800	3800	7800	7800	7900
VOCs - BTEX & MTBE							
Benzene	SGV report + CLEA 1.07	72	72	73	90	100	110
Toluene	SGV report + CLEA 1.07	56000	56000	56000	870	1900	4400
Ethylbenzene	SGV report + CLEA 1.07	25000	25000	25000	520	1200	2800
Xylene, o-	SGV report + CLEA 1.07	41000	42000	43000	480	1100	2600
Xylene, m-	SGV report + CLEA 1.07	41000	42000	43000	630	1500	3500
Xylene, p- (use this for combined m & p)	SGV report + CLEA 1.07	41000	42000	43000	580	1400	3200
MTBE	EIC/AGS/CL:AIRE + CLEA 1.07	75000	75000	75000	20000	33000	63000
VOCs - other benzenes							
Iso-propylbenzene	EIC/AGS/CL:AIRE + CLEA 1.07	25000	25000	25000	390	950	2300
Propylbenzene	EIC/AGS/CL:AIRE + CLEA 1.07	25000	25000	25000	400	980	2300
1,2,4-Trimethylbenzene	EIC/AGS/CL:AIRE + CLEA 1.07	250	250	250	310	360	410

Updated 18/11/15							
Contaminant	**Source of GAC**	**Human health - POSresi (1%SOM)**	**Human health - POSresi (2.5%SOM)**	**Human health - POSresi (6%SOM)**	**Human health - POSpark (1%SOM)**	**Human health - POSpark (2.5%SOM)**	**Human health - POSpark (6%SOM)**
VOCs - chlorobenzenes							
Bromobenzene	EIC/AGS/CL:AIRE + CLEA 1.07	5200	5400	5600	850	2000	3500
Chlorobenzene	LQM/CIEH + CLEA 1.07	12000	13000	14000	680	1500	2900
1,2-Dichlorobenzene	LQM/CIEH + CLEA 1.07	95000	100000	100000	570	1400	3300
1,3-Dichlorobenzene	LQM/CIEH + CLEA 1.07	300	300	300	390	440	470
1,4-Dichlorobenzene	LQM/CIEH + CLEA 1.07	17000	17000	17000	220	540	1300
Hexachlorobenzene	LQM/CIEH + CLEA 1.07	6.5	6.5	6.5	11	11	11
Pentachlorobenzene	LQM/CIEH + CLEA 1.07	110	110	110	190	190	190
1,2,3-trichlorobenzene	LQM/CIEH + CLEA 1.07	1700	1800	1800	130	330	1600
1,2,4-trichlorobenzene	LQM/CIEH + CLEA 1.07	10000	11000	12000	320	790	1900
1,3,5-trichlorobenzene	LQM/CIEH + CLEA 1.07	1600	1700	1800	37	91	220
1,2,3,4-tetrachlorobenzene	LQM/CIEH + CLEA 1.07	830	830	830	120	1600	1600
1,2,3,5-tetrachlorobenzene	LQM/CIEH + CLEA 1.07	79	79	79	39	120	130
1,2,4,5-tetrachlorobenzene	LQM/CIEH + CLEA 1.07	13	13	13	25	26	26
VOCs - chloroalkanes & alkanes							
Bromodichloromethane	EIC/AGS/CL:AIRE + CLEA 1.07	73	73	74	56	67	81
Bromoform	EIC/AGS/CL:AIRE + CLEA 1.07	3900	3900	4000	2700	4700	5200
Chloroethane	EIC/AGS/CL:AIRE + CLEA 1.07	2600	3500	5700	2600	3500	5700
Chloroethene (aka vinyl chloride)	LQM/CIEH + CLEA 1.07	3.5	3.5	3.5	4.8	5	5.4
Chloromethane	EIC/AGS/CL:AIRE + CLEA 1.07	540	550	560	140	150	170
1,1-Dichloroethane	EIC/AGS/CL:AIRE + CLEA 1.07	46000	47000	48000	1800	3000	5600
1,2-Dichloroethane	LQM/CIEH + CLEA 1.07	29	29	29	21	24	28
1,1-Dichloroethene	EIC/AGS/CL:AIRE + CLEA 1.07	2200	3900	11000	2200	3900	5900
Cis 1,2 Dichloroethene	EIC/AGS/CL:AIRE + CLEA 1.07	1300	1300	1400	690	840	1000
Trans 1,2 Dichloroethene	EIC/AGS/CL:AIRE + CLEA 1.07	3800	4000	4000	1700	2100	2700
Dichloromethane	EIC/AGS/CL:AIRE + CLEA 1.07	760	760	760	1500	1500	1500
1,2-Dichloropropane	EIC/AGS/CL:AIRE + CLEA 1.07	1700	1900	2200	160	210	290
Hexachloroethane	EIC/AGS/CL:AIRE + CLEA 1.07	120	130	130	8.2	20	48
Tetrachloroethene	LQM/CIEH + CLEA 1.07	3400	3400	3400	420	950	2200
1,1,1,2-Tetrachloroethane	LQM/CIEH + CLEA 1.07	1400	1400	1400	1500	1800	2100
1,1,2,2-Tetrachloroethane	LQM/CIEH + CLEA 1.07	1400	1400	1400	1800	2100	2300
Tetrachloromethane	LQM/CIEH + CLEA 1.07	340	350	350	170	240	320
Trichloroethene	LQM/CIEH + CLEA 1.07	1200	1300	1300	660	860	1100
1,1,1-Trichloroethane	LQM/CIEH + CLEA 1.07	140000	140000	140000	1400	2900	6400
1,1,2 Trichloroethane	EIC/AGS/CL:AIRE + CLEA 1.07	990	990	1000	1100	1300	1500
Trichloromethane	LQM/CIEH + CLEA 1.07	1700	1700	1700	2700	2900	3100
Other phenols & chlorophenols							
2-Chlorophenol	LQM/CIEH + CLEA 1.07	610	610	610	1100	1100	1100
2,4-Dichlorophenol	LQM/CIEH + CLEA 1.07	610	610	610	1000	1100	1100
2,4-Dimethylphenol	EIC/AGS/CL:AIRE + CLEA 1.07	5000	5000	5000	1400	9600	9900
2-Methylphenol	EIC/AGS/CL:AIRE + CLEA 1.07	25000	25000	25000	15000	48000	49000
3-Methylphenol	EIC/AGS/CL:AIRE + CLEA 1.07	25000	25000	25000	27000	48000	49000
4-Methylphenol	EIC/AGS/CL:AIRE + CLEA 1.07	25000	25000	25000	27000	48000	49000
Pentachlorophenol	LQM/CIEH + CLEA 1.07	180	180	180	220	250	270
2,3,4,6-Tetrachlorophenol	LQM/CIEH + CLEA 1.07	610	610	610	1000	1100	1100
2,4,6-Trichlorophenol	LQM/CIEH + CLEA 1.07	610	610	610	1100	1100	1100
Phthalates							
Bis (2-ethylhexyl) phthalate	EIC/AGS/CL:AIRE + CLEA 1.07	9700	9700	9700	17000	17000	17000
Butyl benzyl phthalate	EIC/AGS/CL:AIRE + CLEA 1.07	130000	130000	130000	250000	260000	260000
Diethyl Phthalate	EIC/AGS/CL:AIRE + CLEA 1.07	49000	50000	50000	14	93000	96000
Di-n-butyl phthalate	EIC/AGS/CL:AIRE + CLEA 1.07	1300	1300	1300	2600	2700	2600
Di-n-octyl phthalate	EIC/AGS/CL:AIRE + CLEA 1.07	11000	11000	11000	20000	20000	20000
Pesticides							
Aldrin	LQM/CIEH + CLEA 1.07	6.6	6.6	6.6	13	13	13
Atrazine	LQM/CIEH + CLEA 1.07	100	100	100	180	180	180
DDD	Hydrock + CLEA 1.07	2700	2700	2700	5700	5700	5700
DDE	Hydrock + CLEA 1.07	2700	2700	2700	5700	5700	5700
DDT	Hydrock + CLEA 1.07	2600	2600	2600	5500	5500	5500
Dichlorvos	LQM/CIEH + CLEA 1.07	120	120	120	140	160	180
Dieldrin	LQM/CIEH + CLEA 1.07	12	12	12	23	23	23
Endosulfan - alpha	LQM/CIEH + CLEA 1.07	490	490	490	940	970	990
Endosulfan - beta	LQM/CIEH + CLEA 1.07	490	490	490	950	980	990
Hexachlorocyclohexanes - alpha (inc. Lindane)	LQM/CIEH + CLEA 1.07	2000	2000	2000	4000	4100	4100
Hexachlorocyclohexanes - beta (inc. Lindane)	LQM/CIEH + CLEA 1.07	150	150	150	300	300	310
Hexachlorocyclohexanes - gamma (inc. Lindane)	LQM/CIEH + CLEA 1.07	71	71	71	140	140	140

Updated 18/11/15							
Contaminant	**Source of GAC**	**Human health - POSresi (1%SOM)**	**Human health - POSresi (2.5%SOM)**	**Human health - POSresi (6%SOM)**	**Human health - POSpark (1%SOM)**	**Human health - POSpark (2.5%SOM)**	**Human health - POSpark (6%SOM)**
Dioxins, furans & dioxin-like-PCBs							
Total dioxins, furans & DL-PCB (aerial dep.)	SGV report + CLEA 1.07	0.023	0.023	0.023	0.049	0.049	0.049
Non-dioxin-like PCBs							
PCB-28	Hydrock + CLEA 1.07	1.2	1.2	1.2	2.5	2.5	2.5
PCB-52	Hydrock + CLEA 1.07	1.2	1.2	1.2	2.5	2.5	2.5
PCB-101	Hydrock + CLEA 1.07	1.2	1.2	1.2	2.5	2.5	2.5
PCB-138	Hydrock + CLEA 1.07	1.2	1.2	1.2	2.5	2.5	2.5
PCB-153	Hydrock + CLEA 1.07	1.2	1.2	1.2	2.5	2.5	2.5
PCB-180	Hydrock + CLEA 1.07	1.2	1.2	1.2	2.5	2.5	2.5
Explosives							
HMX	LQM/CIEH + CLEA 1.07	13000	13000	13000	23000	23000	24000
RDX	LQM/CIEH + CLEA 1.07	790	790	800	19	1500	1600
2,4,6-Trinitrotoluene	LQM/CIEH + CLEA 1.07	130	130	130	260	270	270
Other inorganics							
Antimony	EIC/AGS/CL:AIRE + CLEA 1.07	740	740	740	1700	1700	1700
Barium	EIC/AGS/CL:AIRE + CLEA 1.07	2700	2700	2700	5800	5800	5800
Mercury, elemental	SGV report + CLEA 1.07	4.3	11	26	4.3	11	26
Molybdenum	EIC/AGS/CL:AIRE + CLEA 1.07	1400	1400	1400	2900	2900	2900
Thiocyanate	Hydrock + CLEA 1.07	25	25	25	53	53	53
Other organics							
Biphenyl	EIC/AGS/CL:AIRE + CLEA 1.07	9500	9500	9500	34	84	19000
Carbon disulphide	LQM/CIEH + CLEA 1.07	11000	11000	12000	1300	1900	2700
2,4-Dinitrotoluene	EIC/AGS/CL:AIRE + CLEA 1.07	500	500	500	140	960	990
2,6-Dinitrotoluene	EIC/AGS/CL:AIRE + CLEA 1.07	250	250	250	290	490	500
Hexachloro-1,3-butadiene	LQM/CIEH + CLEA 1.07	25	25	25	48	50	51
Mercury, methyl	SGV report + CLEA 1.07	53	53	53	73	93	97
Styrene	EIC/AGS/CL:AIRE + CLEA 1.07	3000	3000	3000	630	1400	3400
Tributyl tin oxide	EIC/AGS/CL:AIRE + CLEA 1.07	31	31	31	63	64	65
2-Chloronaphthalene	EIC/AGS/CL:AIRE + CLEA 1.07	7500	8400	9000	110	1800	2800
Insufficient data to derive GAC							
n butylbenzene	Insufficient data (EIC)	-	-	-	-	-	-
sec butylbenzene	Insufficient data (EIC)	-	-	-	-	-	-
Carbazole	Insufficient data (EIC)	-	-	-	-	-	-
Dimethyl phthalate	Insufficient data (EIC)	-	-	-	-	-	-
Isopropyltoluene	Insufficient data (EIC)	-	-	-	-	-	-
1-Methylnaphthalene	Insufficient data (EIC)	-	-	-	-	-	-
2-Methylnaphthalene	Insufficient data (EIC)	-	-	-	-	-	-
Sulfur (elemental)	Insufficient data (Hydrock)	-	-	-	-	-	-
1,3,5-Trimethylbenzene	Insufficient data (EIC)	-	-	-	-	-	-
tert butylbenzene	Insufficient data (EIC)	-	-	-	-	-	-
NOTES							
If >1,000,000 is calculated, 1,000,000 is adopted.							
Red text - liquid at ambient temperature, calculated GAC exceeds saturation value and							
Orange text - solid at ambient temperature, calculated GAC exceeds saturation value a							
Blue text - solid at ambient temperature, calculated GAC exceeds saturation value and							
Green text - solid at ambient temperature, calculated GAC exceeds saturation value a							

3.3.3 Exceedance of Saturation Limits

In some instances the CLEA 1.07 model produces GACs with a warning that the value exceeds the saturation value, which is either the solubility of the substance in water or the vapour saturation limit. Limited guidance is given in SR4 (Section 4.12) on how to assess the GAC in these circumstances. Precedence is also set in a number of SGV reports, to date those dealing with the BTEX compounds. These two sets of documentation are contradictory. The original issue of SR4 (CLEA 1.04) (Environment Agency 2009b) gives an example of how to carry out a manual calculation using data for ethylbenzene, whereas the BTEX SGV reports (e.g. Environment Agency March 2009) state that the GAC should be limited to the saturation level. The revised version of SR4 (CLEA 1.05/6) (Environment Agency 2009c) retains the example, but the name ethylbenzene has been removed.

There are three options: to adopt the value as calculated, to limit the GAC to the saturation value, or to undertake a manual calculation as per Section 4.12 of SR4. Again, the guidance is confusing. SR3 (Environment Agency 2009b) cautions against adopting the saturation limit, which is the most conservative, saying that it may be over-conservative. However, this is the approach taken in the BTEX SGV reports.

Clearly, the adoption of a GAC under conditions where the saturation level is exceeded is subjective and professional judgement is involved. With this in mind, the protocol adopted by Hydrock is as follows, and has been derived at by considering the possible values from the three methods given above.

1. For substances where the GAC is highlighted in amber in CLEA, this is adopted as the GAC. For substances where the GAC is highlighted in red, the following apply.

2. For VOCs including BTEX and the volatile TPH Fractions (less than EC10), the saturation value is adopted in line with the latest recommendations in the BTEX SGV reports.

3. For substances which are liquid at ambient temperature, the saturation value is adopted.

4. For substances which are solid at ambient temperature, the manual calculation is undertaken provided there are both oral and inhalation HCVs. The result is compared with the red-highlighted GAC and the lower of the two adopted as the GAC. If there is only one HCV and the calculation cannot be performed, the red-highlighted value is adopted as the GAC where the saturation limit exceed the aqueous solubility, but the saturation value is adopted where the saturation limit exceed the saturated vapour concentration.

5. In some instances the GACs shows a large difference between different SOM where the saturation value has been taken for, say, 1% SOM and the calculated values for 2.5% and 6% SOM. Whilst this may appear inconsistent on first inspection, the results have been adopted as they are and the difference must be attributed to the physico-chemical influence of organic matter in the soil as modelled by CLEA.

3.3.4 GACs for Public Open Space

The first UK methodology for assessing public open space (POS) was published for the C4SLs (CL:AIRE December 2013) based on two land use scenarios:

- Public open space near residential housing (POS_{resi}) includes the predominantly grassed areas adjacent to high density housing and the central green area around which houses are located, as on many housing estates from the 1930s to 1970s. It also includes the smaller areas commonly incorporated in new developments as informal grassed areas or more formal landscaped areas with a mixture of open space and covered soil with planting. It is considered to be a predominantly grassed area up to 0.05 ha and a considerable portion of this (up to 50%) may be bare soil. The site is regularly used by children for playing and may be used for informal sports activities such as a football "kickabout".
- Public park (POS_{park}) is an area of open space provided for recreational use and usually owned and maintained by the Local Authority and could be used for a wide range of activities such as family visits and picnics, children's play area, sporting activities such as football on an informal basis (although this POS is not considered as a dedicated sports pitch) and dog walking. It is considered to be a relatively large are (>0.5 ha) of predominantly grassed open space with no more than 25% of exposed soil.

Hydrock has calculated GACs for these two standard land uses using the land use scenarios given in Tables 3.6 and 3.7 of the CL:AIRE report, but with the following modifications:

- POS_{resi} (Table 3.6), items omitted from the published table in error: building = small terraced house; occupancy period for lifetime averaging (for Cd) AC10-12 = 19, AC13-16 = 15 & AC17-18 = 16; and indoor inhalation rates updated according to a USEPA 2011 publication that supersedes the draft 2006 version used in the CLEA model previously.
- POS_{park} (Table 3.7), typographic errors in the published table: soil ingestion rate for AC1-12 = 50 mg/day and for AC13-18 = 20 mg/day.

Note that these corrections are included in the revised CLEA 1.07 when the C4SL land uses are selected. The calculated GACs are presented in Table 3.5 and are based on a sandy loam soil of pH 7 su.

3.4 Note on Petroleum Hydrocarbons

Petroleum hydrocarbon contamination is complex. The type of crude oil, its distillation, processing and blending, and the subsequent weathering in the environment all result in the development of petroleum residues of extreme chemical complexity (Environment Agency, 2003). The laboratory analysis of petroleum hydrocarbons is highly method dependent. In addition to contaminants such as fuels and lubricating oils, the analyses also pick up a range of other chemicals such as PAHs and phenols, together with naturally occurring substances like humic and fulvic matter in organic soils. For example, TPH determination on dried oak leaves can give a result of 18,000 mg/kg of TPH.

TPH can only be used as a surrogate for estimating the petroleum load of a soil if a spill is well defined but is generally not a sound basis for risk management and regulatory control. International approaches for assessing risks from petroleum hydrocarbons focus on dividing the components into groups and assigning toxicologically potency and fate-transport to each group.

Approaches have been developed internationally, one such proposal is discussed by the Dutch National Institute of Public Health and the Environment (RIVM) (Franken *et al* 1999). The approach is broadly to sub-divide the TPH into fractions based on equivalent carbon length for aliphatic (straight chain) and aromatic (cyclic) compounds. The choice of the fractions is based

on work carried out by, amongst others, the Total Petroleum Hydrocarbon Criteria Working Group (TPHCWG). The Working Group is guided by a steering committee consisting of representatives from industry, government and academia, with the remit *to develop scientifically defensible information for establishing soil cleanup levels that are protective of human health at petroleum contaminated sites.*

Generic assessment criteria can be developed for each TPH fraction in the same way as they can be for named substances, providing certain assumptions are made regarding the applicability of the data to all the compounds in each fraction. A significant part of the TPHCWG activity has been in determining fraction boundaries to maximize confidence in the eventual criteria.

A modified TPHCWG approach has been adopted in a framework developed by the Environment Agency (2005) for use within the UK. The 13 original TPHCWG fractions have been adopted, with the addition of >EC35-EC44. An undifferentiated (i.e. without aliphatic – aromatic split) fraction of >EC44-EC70 has also been suggested but the Agency says it will be reviewing the need for this in due course, once research has been carried out into the toxicity of these heavy-end products like resins and asphaltenes.

The UK suggested approach to petroleum hydrocarbon risk assessment is summarised as follows:

- Measure indicator chemicals and compare with their GAC – these are chemicals which are considered as key risk drivers at petroleum hydrocarbon contaminated sites. The chemicals of potential concern depend on the type of hydrocarbon product, but a (non-exhaustive) list has been suggested by the Environment Agency (2005):

  Non-threshold: benzene, benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3,cd)pyrene.

  Threshold: toluene, ethylbenzene, xylene, naphthalene, fluoranthene, phenanthrene, pyrene.

- Measure TPH fractions and compare with their GAC, based on threshold toxicity only.

  Aliphatic fractions: >EC5-EC6, >EC6-EC8, >EC8-EC10, >EC10-EC12, >EC12-EC16, >EC16-EC35, >EC35-EC44.

  Undifferentiated: >EC44-EC77 (subject to review and confirmation by Agency).

  Aromatic fractions: >EC5-EC7, >EC7-EC8, >EC8-EC10, >EC10-EC12, >EC12-EC16, >EC16-EC21, >EC21-EC35, >EC35-EC44.

- Carry out an additivity check on the TPH fractions if none of the individual fractions exceed their GAC. A Hazard Quotient is calculated for each fraction by dividing the measured concentration by the GAC and these are summed to give the Hazard Index. Where the Hazard Index exceeds unity, this can indicate a potentially significant risk to human health and consideration should proceed to the next stage (remediation or further assessment). Including all the fractions in a Hazard Index is conservative as it assumes all fractions add together in acting on the same target organ within the critical receptor. The Environment Agency (2005) has stated that fractions exhibiting different toxicological properties might be excluded from this process in due course, once research has been completed and further guidance published. The Louisiana Department of Environmental Quality (LDEQ) (2003) has published more detailed guidance, suggesting the following fractions be grouped: (a)

aliphatic >EC8-EC10, >EC10-EC12 & >EC12-EC16, (b) aromatic >EC8-EC10, >EC10-EC12 & >EC12-EC16 and (c) aromatic >EC16-EC21 & >EC21-EC35.

Hydrock has adopted the first two points from above approach and has developed generic assessment criteria for the TPH fractions up to EC35. These are used for assessment where an appropriate level of sampling and laboratory analysis has been carried out, but cannot be used where more generalised TPH analysis has been scheduled (such as DRO/GRO only).

There is, however, some uncertainty concerning the validity of the additivity check. The Environment Agency (2002a) stated in the now withdrawn CLR 9, Section 4.4, "that it is not valid to simply calculate the sum of the fractions 'soil concentration divided by SGV', and compare this with 1.", because total intake, not just intake from soil, needs to be included. It is assumed that the 2005 document takes this into account and that it is erring on the side of conservatism. Until this is formally resolved, Hydrock will report the additivity check for information, using the LDEQ groupings, but will caution against its use in setting remedial goals without further study or publication of definitive guidance. It is more realistic to carry out the additivity test on individual samples rather than on US_{95} values for the whole population, because it is unlikely that the TPH profile of the averaging area will be represented by the US_{95}s of every fraction. More likely, a sample high in one fraction will be low in another, particularly where a mixture of products is present in the ground.

The analysis required for the above methodology, using the aliphatic / aromatic split of TPH fractions, is referred to by Hydrock its "**TPH Level 2 suite**" of determinands. In instances where a full numerical risk assessment is not required, Hydrock carries out a screening analysis known as its "**TPH Level 1 suite**" of determinands. The TPH is divided into fractions, but without the aliphatic / aromatic split. This allows a semi-quantitative risk assessment on the basis of taking a worst case condition. The fraction split with the lowest GAC is deemed to apply to the whole fraction. For example, if the Level 1 analysis indicates the presence of >EC8-EC10, the result is compared to the GACs for the aliphatic >C8-C10 and the aromatic >EC8-EC10 fractions. The worst case would be to assume the whole fraction is aliphatic because this is the lower of the two GACs. This is a conservative approach, and if the test is passed, there is no need to proceed further. However, if the test is failed this does not necessarily indicate unacceptable risks and a more detailed risk assessment is required, with the full TPH Level 2 analysis suite.

3.5 Note on PAHs

A number of authors have used to concept of PAH double ratio plots to investigate the possible source of PAHs in environmental samples.

NAVFAC (Appendix A, April 2003) defines three major source type: petrogenic - generated from organic matter in ancient sediments by geologic conditions (i.e. including petroleum hydrocarbons and refined products); pyrogenic – generated by combustion of organic matter (wood, coal, petroleum, wastes etc.); and biogenic – generated by modern biological processes or by diagenetic processes (e.g. oxidation of organic matter). The following broad trends in the data were recognised:

- a ratio of fluoranthene to pyrene (Fl/Py) of <1 is indicative petrogenic sources, and of >1 is indicative of pyrogenic sources; and

- a ratio of anthracene to phenanthrene (An/Ph) of <0.2 is indicative of pyrogenic sources and of >0.2 is indicative of petrogenic sources.

Yunker *et al* (2002) carried out a literature study of published PAH ratios for a number of petroleum sources, combustion sources and environmental sources. They identified the following broad trends in the data:

- a ratio of fluoranthene to fluoranthene plus pyrene (Fl/(Fl+Py)) of <0.4 is indicative of petroleum hydrocarbon sources; of 0.4-0.5 is indicative of liquid fossil fuel combustion products; and of >0.5 is indicative of grass, wood and coal combustion products;

- a ratio of benzo(a)anthracene to benzo(a)anthracene plus chyrsene (BaA/(BaA+Ch)) of <0.2 is indicative of petroleum hydrocarbon sources; of 0.2-0.35 is indicative of either petroleum hydrocarbon sources or combustion and of >0.35 is indicative of combustion products;

- a ratio of anthracene to anthracene plus phenanthrene (An/(An+Ph)) of <0.1 is indicative petroleum hydrocarbon sources, but can be emissions from lignite, diesel or oil combustion, and of >0.1 is indicative of combustion sources, but can be diesel, coal or some crude oil hydrocarbons;

- a ratio of indeno(1,2,3)pyrene to indeno(1,2,3)pyrene plus benzo(ghi)perylene (IP/(IP+Bghi)) of <0.2 is indicative of petroleum hydrocarbon sources; of 0.2-0.5 is indicative of petroleum hydrocarbon combustion; and >0.5 is indicative of grass, wood or coal combustion products.

Note that in these authors' study of these and a number of other ratios they cautioned there are exceptions to these generalisations on account of the variability and complexity of, for example, different crude oil sources.

Costa *et al* (2004) and Costa and Sauer (2005) used plots of fluoranthene to pyrene (Fl/Py) against benzo(a)anthracene to chrysene (BaA/Ch), benzo(a)anthracene to benzo(a)pyrene (BaA/BaP) and chrysene to benzo(a)pyrene (Ch/BaP) to distinguish coal tar and creosote contaminants from combustion products they referred to as urban background. They report distinctive areas on the plots relating to the sites being studied. Litton (2006) has also used these ratios to similar effect on other sites.

ALcontrol Laboratories (2006) also uses plots of fluoranthene to pyrene (Fl/Py) against benzo(a)anthracene to chrysene (BaA/Ch). Jones (2008) confirms that the following broad trends are derived from unpublished work at the laboratory:

- a ratio of Fl/Py of <0.65 is indicative of used engine oil when the ratio of BaA/Ch is higher (approaching 1.40) or other petroleum products when the ratio of BaA/Ch is lower (above about 0.35);

- a ratio of F/Py of 0.65-1 is indicative of petroleum combustion products; and

- a ratio of Fl/Py of <1 is indicative of coal when the ratio of BaA/Ch is higher (approaching 1.40) or other combustion soots when the ratio of BaA/Ch is lower (above about 0.35).

Stogiannidis and Laane (2015) undertook a review of published literature and produced a summary (their Table 4 plus supporting text) of a number of PAH ratios and threshold values for the initial screening or identification of pyrogenic or petrogenic PAHs.

It is evident from the literature that if a cross plot is made of two ratios it is often possible to see a separation in samples from different sources and, together with other supporting information, gain a better understanding of the likely source of the PAHs. Different ratios may give differing degrees of separation and so trying several plots is often useful. The work of Stogiannidis and Laane can help distinguish between oil-spill related PAHs and those produced by combustion.

3.6 Note on Cyanide

Cyanide toxicity is complicated but it is generally accepted that cyanide species exist in 'free' and 'complex' forms. Free cyanide species are toxic and it is generally agreed that free cyanide provides a more scientifically correct basis for the establishment of generic criteria. This approach has been followed in this report.

Metal-cyanide complexes (complex cyanide) are generally not considered toxic but in certain environmental fate reactions it is possible that dissociation may release toxic free cyanide into the water environment. This might occur where complex cyanides are exposed to direct sunlight and photolysis takes place. Such circumstances are considered very rare.

There is no published approach to assessing acute toxicity, but this can be a concern on gas works sites where spent oxide or, more particularly foul lime (aka "blue billy") from the older processes, may contain significant concentrations of free cyanide. This is a particular problem because young children may be attracted to the bright blue deposits.

A methodology was presented by Macklin *et al* (December 2012): an acute oral LOAEL dose was identified by the then Health Protection Agency as 0.4 mg/kg bw/day; a dose of 5 g of soil was selected based on USEPA studies, eaten by a 10 kg weight child. This equates to a trigger level of 800 mg/kg free cyanide in soil. Above this concentration, there is a plausible hazard of ingestion of a harmful or fatal dose.

3.7 Note on Polychlorinated Biphenyls

PCBs fall into two groups, the dioxin-like (DL) and the non-dioxin-like (NDL), by virtue of their toxicity.

The Environment Agency methodology for DL-PCBs is included with dioxins and furans in the published dioxins SGV report (Science Report SC050021 / Dioxins SGV). The basis of this report is that because of the additive nature of these substances it is inappropriate to produce individual SGVs. The approach is to obtain speciated analyses of 12 DL-PCBs and, using an Agency spreadsheet, calculate a Hazard Index for a prescribed mixture of substances. SGVs can only be produced for atmospheric fall-out sites where the proportions of the individual substances are assumed to be uniform across the UK according to a table listed in the document.

For potentially industrially contaminated sites (such as where PCBs have escaped from transformers) only a Hazard Index can be produced. This can be converted into a GAC by

calculation, but such a GAC is only applicable to conditions where the mixture of substances is unchanged. In effect, Hazard Indices will be calculated for each soil sample and provided these are all less than unity, the site poses no significant risk.

There is not Agency guidance with respect to NDL-PCBs. Hydrock has produced individual GACs for a number of these. A precautionary approach has been taken, in that the NDL-PCBs are assumed to have additive effects and the same approach is taken as with Hydrock's assessment of contamination by TPH fractions. Namely, each substance is compared with its GAC, but there is an additional stage in which a Hazard Index is also calculated. This is similar to the Agency's approach for DL-PCBs, but the Hazard Index calculation is performed at a different stage in the process.

Currently, these two approaches are separate. That is to say, there is no assumption of additvity of effect between DL- and NDL-PCBs. The logic for this is the fact that these two groups where established in the first place on account of their different effects.

The toxicity of the DL-PCBs is far greater than that of the NDL-PCBs. For example, the residential SGV for the full list of dioxins, furans and DL-PCBs under atmospheric fall-out conditions is 0.0087 mg/kg (NB: using only the 12 DL-PCBs in this list gives a GAC of 0.051 mg/kg), whist the lowest GAC for the NDL-PCBs is 0.32 mg/kg under the same exposure conditions. Analyses for DL-PCBs must be undertaken with very low laboratory reporting limits (typically 1ng/kg).

In real life examples, it is almost certain that both forms of PCBs will be present at a site. This is because the marketed products (known as Aroclors) were mixtures of many PCB congeners and they all appear to contain members from both groups (according to literature researched by Hydrock). Perhaps this is why the Agency has only issued guidance on the DL-PCBs.

Logically, if a site contains any PCBs (for example as a 'total' analysis) it is likely to contain DL-PCBs. In which case, the safe concentrations will be very low and can only be confirmed by re-analysing using low detection methods and following the Agency methodology on a sample-by-sample basis. This is effect means that GACs for NDL-PCBs are redundant. The implications of the Agency methodology have yet to be fully understood by the contaminated land community. For example, it would appear that standard laboratory tests for NDL-PCBs are irrelevant. Furthermore, standard reporting limits are far too high, typically 1ug/kg. The only instance where NDL-PCBs become the risk driver at a PCB contaminated site would be if for some reason the DL-PCBs had preferentially degraded.

The Hydrock methodology for PCB risk assessment is to carry out analyses for the 12 DL-PCBs (commonly referred to as the WHO-12) and the 7 most persistent NDL-PCBs (commonly referred to as the ICES-7) at a detection limit of 1 ng/kg (Table 3.6). This is considered conservative because it covers both groups even though the risk driver is most likely to be the DL-PCB group.

The WHO-12 are assessed using the Environment Agency SGV report methodology, to produce a Hazard Index, and the ICES-7 are compared to Hydrock-derived GACs with additivity check. Note that PCB118 appears in both lists and so in assessed under the Environment Agency methodology as a DL-PCB.

Table 3.6: PCB Suites

WHO-12 (dioxin-like)	ICES-7 (most persistent)
PCB-77	PCB-28
PCB-81	PCB-52
PCB-126	PCB-101
PCB-169	PCB-118
PCB-105	PCB-138
PCB-114	PCB-153
PCB-118	PCB-180
PCB-123	(Non-dioxin-like apart
PCB-156	from PCB-118)
PCB-157	
PCB-167	
PCB-189	

3.8 Note on Pesticides and Herbicides

Unless there is evidence to suggest that a certain pesticide or herbicide has been used on the land, the standard approach adopted by Hydrock is to screen for the presence of common pesticides in the organochlorine, organophosphorous and organonitrogen groups (OCP, OPP & OPN), for example on agricultural land. Note that the only available GACs are for pesticides in these groups (and then only a sub-set of the whole).

3.9 Note on Radon

Advice on radon protection in England is provided by Public Health England (www.ukradon.org), formerly the Health Protection Agency (*The Indicative Atlas of Radon in England and Wales,* HPA-RPD-033 (Miles *et al* 2007) and RCE-15 (2010)), and by the BRE (BRE Report BR 211 (Scivyer 2015)). An area of the country can be categorised according to the percentage of existing homes where radon is present above the Action Level: 0-1% lower probability, 1-3% and 3-10% intermediate probability and >10% higher probability. It is important to understand that the database on which these numbers are based is incomplete and contains more data points in areas of the country that have traditionally been known for high radon concentrations. As more properties are monitored, the categorisation may change.

The areas where >1% of homes exceed the Action Level are known as Radon Affected Areas.

The Building Regulations cite BR 211 and require basic radon protection measures in new buildings in areas of England and Wales where 3-10% of properties exceed the Action Level and full radon protection measures where >10% exceed the Action Level.

Landlords and employers have a legal duty to keep radon levels as low as practicable and to install remedial measures if levels are too high. Commercial new build includes protection measures similar to those for new homes, but once occupied they are subject to the HSW Act and the Ionising Radiations Regulations 1999.

Private residents are advised to have a radon test where their property is in a Radon Affected Area, and to fit remedial measures if levels are too high.

The Law Society's advice to conveyancing solicitors is to ask the vendor standard questions concerning whether the property is in a radon affected area, whether it was constructed with radon protection measures and whether a radon test has been carried out by the vendor. Hydrock understands that PHE is discussing with the Law Society the adoption of stronger wording to these questions.

In 2009 the then Health Protection Agency recommended that Building Regulations and supporting documents should be amended to ensure that *all* new buildings, extensions, conversions and refurbished buildings in the UK include basic radon protective measures as a minimum. This recommendation was rejected by the Government. Consequently, the current situation is that a developer is *required* only to install protective measures in buildings where >3% of existing properties are above the Action Level, but is not required to install them in Radon Affected Areas where 1-3% of existing properties exceed the Action Level (even though there may be future implications for occupiers of these buildings).

Note that whilst membranes intended to protect against radon *may* also protect against methane and carbon dioxide, this will only be the case if they have also been specifically designed (and installed) to protect against those gases (BS 8485:2015, Annex G).

3.10 Note on the Use of Non-UK Assessment Criteria

In rare instances reference to assessment criteria or other trigger values published by other authoritative bodies (other than those concerned with the UK contaminated land regime) may provide background information on the likely degree of contamination of a substance. Trigger levels indicative of naturally occurring concentrations or risk-based guidance from other countries often help place site analysis results into context. It must be remembered that use of non-UK assessment criteria is not in compliance with the UK contaminated land assessment regime given in the Model Procedures. However, these criteria can be of use as an aid to professional judgement and can help in determining a cost-effective and sustainable remedial strategy for a site, in consultation with the regulatory authorities.

3.11 Site-specific Assessment Criteria for Volatile Substances

The CLEA methodology includes the inhalation of indoor vapours where there are occupied buildings in the standard land use scenarios. For volatile substances such as those listed in Table 3.7 the percentage contribution of the indoor vapour pathway to the average daily exposure (ADE) can be seen to be significant (up to 100%). Consequently, if this pathway can be severed by the installation of a suitably designed and installed organic vapour barrier in the buildings only the remaining CLEA exposure pathways need to be considered for the site. Assessment criteria can be calculated for the remaining exposure pathways.

Site Specific Assessment Criteria (SSAC) have been calculated using CLEA UK using the same input parameters etc. as for the Hydrock GACs but with the indoor vapour pathway turned off in the model. The resulting SSACs can be used to inform on risk from these contaminants in the same way as GACs are used, but apply only if suitable membranes are provided and verified.

Table 3.7: Derivation of Site Specific Assessment Criteria for Volatile Substances for CLEA Standard Land Uses *Excluding the Indoor Vapour Pathway* (mg/kg) – on following page(s).

Updated 18/11/15		Human Health Generic Assessment Criteria (no indoor vapour pathway) (mg/kg)								
Contaminant	**Source of GAC**	Human health - residential without plant uptake, no indoor vapour (1%SOM)	Human health - residential without plant uptake, no indoor vapour (2.5%SOM)	Human health - residential without plant uptake, no indoor vapour (6%SOM)	Human health - residential with plant uptake, no indoor vapour (1%SOM)	Human health - residential with plant uptake, no indoor vapour (2.5%SOM)	Human health - residential with plant uptake, no indoor vapour (6%SOM)	Human health - commercial, no indoor vapour (1%SOM)	Human health - commercial, no indoor vapour (2.5%SOM)	Human health - commercial, no indoor vapour (6%SOM)
TPH fractions										
TPH ali EC05-EC06	LQM/CIEH + CLEA 1.07	320000	320000	320000	5000	11000	25000	300	560	1200
TPH ali >EC06-EC08	LQM/CIEH + CLEA 1.07	320000	320000	320000	15000	34000	71000	140	320	740
TPH ali >EC08-EC10	LQM/CIEH + CLEA 1.07	6400	6400	6400	1600	2900	4300	78	94000	94000
TPH ali >EC10-EC12	LQM/CIEH + CLEA 1.07	6500	6500	6500	4600	5500	6000	94000	95000	95000
TPH ali >EC12-EC16	LQM/CIEH + CLEA 1.07	6500	6500	6500	6300	6300	6400	95000	95000	95000
TPH ali >EC16-EC35	LQM/CIEH + CLEA 1.07	-	-	-	-	-	-	-	-	-
TPH ali >EC35-EC44	LQM/CIEH + CLEA 1.07	-	-	-	-	-	-	-	-	-
TPH aro EC05-EC07	LQM/CIEH + CLEA 1.07	29000	29000	29000	90	180	390	1200	2300	4700
TPH aro >EC07-EC08	LQM/CIEH + CLEA 1.07	29000	29000	29000	150	350	800	870	420000	420000
TPH aro >EC08-EC10	LQM/CIEH + CLEA 1.07	2600	2600	2600	58	140	310	38000	38000	38000
TPH aro >EC10-EC12	LQM/CIEH + CLEA 1.07	1800	1800	1800	83	200	430	38000	38000	38000
TPH aro >EC12-EC16	LQM/CIEH + CLEA 1.07	-	-	-	-	-	-	-	-	-
TPH aro >EC16-EC21	LQM/CIEH + CLEA 1.07	-	-	-	-	-	-	-	-	-
TPH aro >EC21-EC35	LQM/CIEH + CLEA 1.07	-	-	-	-	-	-	-	-	-
TPH aro >EC35-EC44	LQM/CIEH + CLEA 1.07	-	-	-	-	-	-	-	-	-
TPH >EC44-EC70	LQM/CIEH + CLEA 1.07	-	-	-	-	-	-	-	-	-
VOCs - BTEX & MTBE										
Benzene	SGV report + CLEA 1.07	37	37	37	0.13	0.27	0.59	530	530	540
Toluene	SGV report + CLEA 1.07	29000	29000	29000	150	350	800	870	420000	420000
Ethylbenzene	SGV report + CLEA 1.07	13000	13000	13000	110	260	600	180000	180000	190000
Xylene, o-	SGV report + CLEA 1.07	22000	22000	22000	190	460	1100	260000	280000	300000
Xylene, m-	SGV report + CLEA 1.07	22000	22000	22000	210	500	1200	260000	280000	300000
Xylene, p- (use this for combined m & p)	SGV report + CLEA 1.07	22000	22000	22000	200	470	1100	260000	280000	300000
MTBE	EIC/AGS/CL:AIRE + CLEA 1.07	39000	39000	39000	150	300	600	550000	550000	560000
VOCs - other benzenes										
Iso-propylbenzene	EIC/AGS/CL:AIRE + CLEA 1.07	13000	13000	13000	220	520	1200	180000	180000	180000
Propylbenzene	EIC/AGS/CL:AIRE + CLEA 1.07	13000	13000	13000	230	550	1200	180000	190000	190000
1,2,4-Trimethylbenzene	EIC/AGS/CL:AIRE + CLEA 1.07	130	130	130	2.5	6.1	14	1800	1800	1900
VOCs - chlorobenzenes										
Bromobenzene	EIC/AGS/CL:AIRE + CLEA 1.07	2900	3000	3000	22	52	120	31000	34000	37000
Chlorobenzene	LQM/CIEH + CLEA 1.07	6200	6300	6400	40	94	210	63000	77000	91000
1,2-Dichlorobenzene	LQM/CIEH + CLEA 1.07	54000	55000	56000	640	1500	3500	580000	670000	730000
1,3-Dichlorobenzene	LQM/CIEH + CLEA 1.07	130	130	130	1.7	4.1	9.3	3000	3100	3100
1,4-Dichlorobenzene	LQM/CIEH + CLEA 1.07	8800	8900	8900	100	250	570	130000	130000	130000
Hexachlorobenzene	LQM/CIEH + CLEA 1.07	-	-	-	-	-	-	-	-	-
Pentachlorobenzene	LQM/CIEH + CLEA 1.07	-	-	-	-	-	-	-	-	-
1,2,3-trichlorobenzene	LQM/CIEH + CLEA 1.07	950	960	960	31	74	160	12000	13000	13000
1,2,4-trichlorobenzene	LQM/CIEH + CLEA 1.07	6300	6500	6600	200	480	1100	49000	60000	69000
1,3,5-trichlorobenzene	LQM/CIEH + CLEA 1.07	920	940	940	31	74	160	9300	11000	12000
1,2,3,4-tetrachlorobenzene	LQM/CIEH + CLEA 1.07	-	-	-	-	-	-	-	-	-
1,2,3,5-tetrachlorobenzene	LQM/CIEH + CLEA 1.07	34	34	34	2.4	5.4	11.0	690	700	700
1,2,4,5-tetrachlorobenzene	LQM/CIEH + CLEA 1.07	-	-	-	-	-	-	-	-	-
VOCs - chloroalkanes & alkanes										
Bromodichloromethane	EIC/AGS/CL:AIRE + CLEA 1.07	38	38	38	0.11	0.22	0.46	500	520	530
Bromoform	EIC/AGS/CL:AIRE + CLEA 1.07	-	-	-	-	-	-	-	-	-
Chloroethane	EIC/AGS/CL:AIRE + CLEA 1.07	350000	350000	350000	780	1400	2600	2600	3500	5700
Chloroethene (aka vinyl chloride)	LQM/CIEH + CLEA 1.07	1.8	1.8	1.8	0.0038	0.0069	0.013	26	26	26
Chloromethane	EIC/AGS/CL:AIRE + CLEA 1.07	310	310	310	0.45	0.88	1.6	1900	2200	3000
1,1-Dichloroethane	EIC/AGS/CL:AIRE + CLEA 1.07	25000	25000	25000	64	120	240	1800	3000	5600
1,2-Dichloroethane	LQM/CIEH + CLEA 1.07	15	15	15	0.032	0.057	0.11	200	200	210
1,1-Dichloroethene	EIC/AGS/CL:AIRE + CLEA 1.07	5700	5700	5700	19	39	82	2200	3900	8000
Cis 1,2 Dichloroethene	EIC/AGS/CL:AIRE + CLEA 1.07	680	690	690	1.8	3.5	7.1	3900	6600	9900
Trans 1,2 Dichloroethene	EIC/AGS/CL:AIRE + CLEA 1.07	2100	2100	2100	6.5	13	27	3400	6200	13000
Dichloromethane	EIC/AGS/CL:AIRE + CLEA 1.07	390	390	390	0.70	1.3	2.3	7300	9000	9000
1,2-Dichloropropane	EIC/AGS/CL:AIRE + CLEA 1.07	1200	1300	1400	4.3	8.4	18	1200	2100	11000
Hexachloroethane	EIC/AGS/CL:AIRE + CLEA 1.07	64	64	64	1.8	4.3	9.3	900	920	930
Tetrachloroethene	LQM/CIEH + CLEA 1.07	1700	1700	1700	11	26	58	420	950	26000
1,1,1,2-Tetrachloroethane	LQM/CIEH + CLEA 1.07	730	730	730	5.4	13	29	10000	10000	11000
1,1,2,2-Tetrachloroethane	LQM/CIEH + CLEA 1.07	730	730	730	2.8	6.1	14	11000	11000	11000
Tetrachloromethane	LQM/CIEH + CLEA 1.07	180	180	180	1.1	2.5	5.7	1500	2500	2500
Trichloroethene	LQM/CIEH + CLEA 1.07	660	660	660	3.0	6.5	15	1500	3200	9000
1,1,1-Trichloroethane	LQM/CIEH + CLEA 1.07	75000	76000	76000	330	730	1600	1400	2900	6400
1,1,2 Trichloroethane	EIC/AGS/CL:AIRE + CLEA 1.07	510	510	510	2.0	4.2	9.4	7100	7300	7400
Trichloromethane	LQM/CIEH + CLEA 1.07	880	880	880	2.5	4.8	10	5200	9100	20000
Other inorganics										
Antimony	EIC/AGS/CL:AIRE + CLEA 1.07	-	-	-	-	-	-	-	-	-
Barium	EIC/AGS/CL:AIRE + CLEA 1.07	-	-	-	-	-	-	-	-	-

Updated 18/11/15		Human Health Generic Assessment Criteria (no indoor vapour pathway) (mg/kg)								
Contaminant	**Source of GAC**	Human health - residential without plant uptake, no indoor vapour (1%SOM)	Human health - residential without plant uptake, no indoor vapour (2.5%SOM)	Human health - residential without plant uptake, no indoor vapour (6%SOM)	Human health - residential with plant uptake, no indoor vapour (1%SOM)	Human health - residential with plant uptake, no indoor vapour (2.5%SOM)	Human health - residential with plant uptake, no indoor vapour (6%SOM)	Human health - commercial, no indoor vapour (1%SOM)	Human health - commercial, no indoor vapour (2.5%SOM)	Human health - commercial, no indoor vapour (6%SOM)
Mercury, elemental	SGV report + CLEA 1.07	4.3	11	26	4.3	11	26	4.3	11	26
Molybdenum	EIC/AGS/CL:AIRE + CLEA 1.07	-	-	-	-	-	-	-	-	-
Thiocyanate	Hydrock + CLEA 1.07									
Other organics										
Biphenyl	EIC/AGS/CL:AIRE + CLEA 1.07	-	-	-	-	-	-	-	-	-
Carbon disulphide	LQM/CIEH + CLEA 1.07	6200	6300	6300	33	70	150	2100	4200	75000
2,4-Dinitrotoluene	EIC/AGS/CL:AIRE + CLEA 1.07	-	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	EIC/AGS/CL:AIRE + CLEA 1.07	-	-	-	-	-	-	-	-	-
Hexachloro-1,3-butadiene	LQM/CIEH + CLEA 1.07	13	13	13	1.5	3.1	5.6	290	290	290
Mercury, methyl	SGV report + CLEA 1.07	-	-	-	-	-	-	-	-	-
Styrene	EIC/AGS/CL:AIRE + CLEA 1.07	1500	1500	1500	11	25	58	23000	23000	23000
Tributyl tin oxide	EIC/AGS/CL:AIRE + CLEA 1.07	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	EIC/AGS/CL:AIRE + CLEA 1.07	-	-	-	-	-	-	-	-	-
NOTES										
If >1,000,000 is calculated, 1,000,000 is adopted.										
Red text - liquid at ambient temperature, calculated GAC exceeds saturation value and highlighed in red in CLEA - saturation value adopted for GAC										
Orange text - solid at ambient temperature, calculated GAC exceeds saturation value and highlighted red in CLEA - manual calculation not possible as only one HCV - saturated vapour concentration exceed, so saturation valu										
Blue text - solid at ambient temperature, calculated GAC exceeds saturation value and highlighted red in CLEA - manual calculation not possible as only one HCV - aqueous solubility exceed, so original red-highlighted value ad										
Green text - solid at ambient temperature, calculated GAC exceeds saturation value and highlighted red in CLEA - manual calculation undertaken but result is greater than original red-highlighted value, so original red-highlighte										

3.12 Determination of Contaminated Land Under Part 2A of the Environmental Protection Act 1990

The legal test for land contamination under the statutory guidance of Part 2A of the Environment Protection Act 1990 (i.e. "significant harm or significant possibility of significant harm") is **unacceptable** intake or direct bodily contact.

The situation was clarified by Defra (July 2008) in its guidance on the legal definition of contaminated land.

Part 2A does not prescribe number-based thresholds because it would be very difficult to produce numbers which are meaningful and proportionate, given the lack of scientific information about many substances and the site specific nature of risks. Instead, it relies on local authorities to assess risks posed on individual sites, then decide whether (in their view) the risks represent SPOSH, and thus whether land qualifies as **contaminated**.

The intention of the approach is that local authorities can use their judgement to ensure that Part 2A focuses on the SPOSH it was designed to address, whilst avoiding unnecessary burdens on land where contaminants may be present but there is no SPOSH.

In making Part 2A decisions, local authorities are likely to face some difficult decisions caused by uncertainty on the nature of risks. But they should be confident in exercising their judgement on the basis of available information. Part 2A clearly leaves judgements about what constitutes a SPOSH to local authorities, and it is up to them to make decisions.

GACs are not proxy thresholds for SPOSH, and should not be used as such. They describe levels (based on cautious estimates and assumptions in hypothetical example situations) at which concentrations of contaminants in soil may cease to pose **no appreciable/ minimal** risk. They do not seek to describe levels at which there might be a SPOSH.

Thus, if a GAC is exceeded, the assessor will usually need to conduct a detailed quantitative risk assessment to discover whether there is a **possibility of significant harm** and, if so, the nature of that risk. Whether or not SPOSH exists will depend on the results of risk assessment, the existence and nature of any pollutant linkages, and (ultimately) the judgement of the local authority.

As a general guide:

(i) For substances where there is a GAC, the more the GAC is exceeded, the more likely it is that an authority should consider the risks to be SPOSH.

(ii) Generally, the cautious nature of GACs means that local authorities may conclude that SPOSH is unlikely to exist at concentrations close to GACs.

(iii) In some cases, land with concentrations of contaminants which marginally exceed a GAC (say, up to a few times the GAC) might give rise to SPOSH if, for example, the receptor is particularly sensitive; or if further assessment finds that exposure is higher than that estimated in the GAC; or if there is little uncertainty in the underlying toxicology and HCV.

(iv) In other cases a GAC may be exceeded by tens of times and there might be no SPOSH (e.g. if further assessment found that exposure was much lower than that estimated using the GAC).

In view of the above, Hydrock has not to attempted to derive numerical SPOSH concentrations, but to use GACs as screening values. Where GACs are exceeded, it is recommended that the linkages and the uncertainties in the data are reviewed in consultation the regulatory authority to aid its judgment on determination.

A possible next phase would be to refine the generic risk assessment with a detailed risk assessment. This would involve using site-specific input parameters relevant to the particular site, in the CLEA model.

Revised contaminated land statutory guidance was published by Defra in 2012 with respect to Part 2A. The Act itself is unchanged. A new four category test (and associated classifications) has been introduced to ensure a high standard without being excessive. The aims are to make the regime target higher risk sites more efficiently, remove excessive cost burdens and facilitate the development of technical tools to increase consistency over time. This includes supporting non-technical guidance including a possible framework to aid in deciding into which of the proposed four new Categories of land a site should be placed.

Conversely, the regime is not intended to intervene where there is only a low level of risk, particularly in cases where it is difficult to demonstrate anything other than a very small hypothetical risk, as might be the case with vast swathes of land.

Defra states that there is a need for a more pragmatic approach. In practice, deciding when regulatory intervention is justified involves making decisions about when to act on a wide spectrum of risk, with varying levels of uncertainty over the precise nature of the risks. A number of the changes are intended to clarify when land is “contaminated land”. These are most likely to affect the assessment and remediation of contaminated land and are listed below.

1. Statutory explanation of broad objectives of the regime to explain that regulators should seek a reasonable balance between dealing with unacceptable risks whilst ensuring that burdens on businesses and society are manageable and sustainable. The regime should be seen as an option of last resort; that land is in effect “innocent until proven guilty”. This should give greater clarity for all concerned on what the regime seeks to achieve, and what it seeks to avoid.

2. Local Authorities to produce risk summaries before land may be determined as “contaminated”. Summaries must be understandable to non-experts to provide greater transparency and accountability. Easier for all involved to understand what local authority considers risks to be. It should be easier for Local Authorities managers, lawyers and councillors to be involved in decision making, particularly more difficult sites where wider socio-economic effects need to be take into account. Easier to share experience between Local Authorities leading to greater consistency in decision making.

3. Clarification of the legal test of significant harm to human health to mean serious unhealthy conditions of the body or part of it, and not minor/trivial complaints. This is unlikely to have a major effect because, to date, no site in England and Wales has been determined on

grounds that significant harm to human health has actually been caused. However, greater clarity on the meaning of significant harm is likely to help clarify the related legal test of significant possibility of significant harm.

4. Explanation of how to decide when land is (and is not) "contaminated land". A new four category test which recognises the spectrum of risk encountered by assessors, and the reality that some sites are clearly contaminated land (Category 1), some clearly are not (Category 4), and others need more detailed consideration before a decision can be taken (Categories 2 and 3). Greater clarity that decision making is a two stage process in which the regulator must first understand the risk before deciding whether the risk is sufficiently high to justify regulatory intervention. The aim is to create legal certainty around what definitely is, and is not, contaminated land, whilst leaving Local Authorities with discretion to exercise local judgement on less straightforward land.

5. Category 4 will include normal background levels of contamination unless there is some exceptional reason to consider otherwise. Clarification that land at SGV/GAC levels is likely to be well into Category 4. Statutory backing for the sector to develop new tests to describe the top of Category 4 (including the production of Category 4 Screening Levels). This should provide clarity on when land will not be caught, reduced uncertainty and costs for landowners and businesses and faster decision making on non-problematic land.

6. Clarify the status of GACs and how they should (and should not) be used including a legal backing for the use of robust GACs produced by reputable, non-governmental, organisations within the sector (LQM/CIEH, EIC/AGS/CL:AIRE). Backing the development of new GACs (or similar tools) as might be developed by the sector to help implement the new Guidance. Specific legal backing for the current set of SGVs/GACs, and clarity on how they can (and cannot) be used.

7. Category 1 land is clearly caught by the regime when there is clear evidence of an unacceptable risk (e.g. similar land is known to have caused significant harm). This should give clarity on when land is definitely "contaminated land", and help frame the spectrum of risk raised by land contamination.

8. New category of land under which Local Authorities would decide whether a site is in Category 2 (contaminated land) or Category 3 (not contaminated land). The new test would rest on whether or not the local authority believes there is a strong case for regulatory action, taking account of the scientific evidence, the objectives of the regime, and other factors. The local authority would start by considering health risks alone, and if they clearly tend towards the Category 4 or the Category 1 the decision could be taken at this point. However, if this does not lead to a decision, the local authority would consider wider socio-economic factors (e.g. cost, views of local people, etc) before deciding. If the local authority still cannot decide, the default decision is that the site is not contaminated land.

9. Reduce "regulatory creep" (excessive remediation of land forced by regulatory uncertainty) with greater clarity on what the enforcing authority can "reasonably" require by way of remediation. Clarity that SGVs/GACs must not be used as "one size fits all" remediation requirements; and that Part 2A can only be used to force remediation to a level where land

is no longer contaminated land (i.e. to a point where land is in Category 3), but it should not be used to force remediation beyond this point.

10. Guidance on the process of risk assessment: the need to take a strategic approach; the aim of dismissing low risk sites as soon as possible in order to focus on finding higher risk sites; and the general need to ensure that risk assessment is conducted in a timely and efficient manner. Clarify that in considering possible future risks the local authority should consider likely future situations (e.g. rather than hypothetical worst possible case situations). Recognise that in practice there is often a need for authorities to bring in external experts and act in accordance with their advice. Recognise that scientific and technical uncertainty is an inevitable part of contaminated land risk assessment, and set out broadly how regulators should deal with it. It is important that this is recognised in the Guidance to support the regulators who have to make decisions in the face of uncertainty.

In deciding whether or not a significant possibility of significant harm to human health exists, the local authority should first understand the possibility of significant harm from the relevant contaminant linkage(s) and the levels of uncertainty attached to that understanding, before it goes on to decide whether or not the possibility of significant harm is significant.

The term “possibility of significant harm” means the risk posed by one or more relevant contaminant linkage(s) relating to the land. It comprises:

- the estimated likelihood that significant harm might occur to an identified receptor, taking account of the current use of the land in question; and
- the estimated impact if the significant harm did occur i.e. the nature of the harm, the seriousness of the harm to any person who might suffer it, and (where relevant) the extent of the harm in terms of how many people might suffer it.

Having completed its estimation of the possibility of significant harm, the local authority should produce a risk summary.

The decision on whether the possibility of significant harm being caused is significant (SPOSH) is a regulatory decision to be taken by the relevant local authority. In deciding whether the possibility of significant harm being caused is significant, the authority is deciding whether the possibility of significant harm posed by contamination in, on or under the land is sufficiently high that regulatory action should be taken to reduce it, with all that would entail.

In deciding whether or not land is contaminated land on grounds of significant possibility of significant harm to human health, the local authority should use the four categorisations.

The decision between Categories 2 and 3 is a positive legal test, which means that the starting assumption should be that land does not pose a significant possibility of significant harm unless there is reason to consider otherwise. Category 3 may include land where the risks are not low, but nonetheless the authority considers that regulatory intervention under Part 2A is not warranted.

The local authority should first consider its assessment of the possibility of significant harm to human health, including the estimated likelihood of such harm, the estimated impact if it did occur, the timescale over which it might occur, and the levels of certainty attached to these

estimates. If the authority considers, on the basis of this consideration alone, that the strong case does or does not exist, the authority should make its decision on whether the land falls into Category 2 or Category 3 on this basis regardless of any other factors.

However, if the authority considers that it cannot make a decision, it should consider other factors which it considers are relevant, including:

- The likely direct and indirect health benefits and impacts of regulatory intervention including benefits of reducing or removing the risk posed by contamination, any risks from contaminants being mobilised during remediation and any indirect impacts such as stress-related health effects that may be experienced by affected people, particularly local residents. If it is not clear to the authority that the health benefits of remediation would outweigh the health impacts, the authority should presume the land falls into Category 3 unless there is strong reason to consider otherwise.
- The authority's initial estimate of what remediation would involve; how long it would take; what benefit it would be likely to bring; whether the benefits would outweigh the financial and economic costs; and any impacts on local society or the environment from taking action that the authority considers to be relevant.

Deregulatory Change to Definition of Contaminated Land as it Relates to Water Pollution.

Defra will commence Section 86 of the Water Act 2003 so that in future this would only be the case if there is significant pollution of controlled waters or significant possibility of such pollution. To explain how to decide whether or not "significant" pollution is being caused, the Statutory Guidance introduced new Category 1-4 tests similar to those for deciding when there is a significant risk to human health as described above. There will be new technical guidance produced by the Environment Agency. In practice, this change is likely to have little effect on the practical implementation of the Part 2A regime because the Environment Agency has already been prioritising sites likely to meet the new "significance" test.

The 'pollution of Controlled Waters' means the entry into controlled Waters of any poisonous, noxious or polluting matter or any solid waste matter. Given that the Part 2A regime seeks to identify and deal with significant pollution (rather than lesser levels of pollution), the local authority should seek to focus on pollution which: (i) may be harmful to human health or the quality of aquatic ecosystems or terrestrial ecosystems directly depending on aquatic ecosystems; (ii) which may result in damage to material property; or (iii) which may impair or interfere with amenities and other legitimate uses of the environment.

In deciding whether significant pollution of Controlled Waters is being caused, the local authority should consider that this test is only met where it is satisfied that the substances in question are continuing to enter controlled Waters; or that they have already entered the waters and are likely to do so again in such a manner that past and likely future entry in effect constitutes on-going pollution.

3.13 Generic Risk Assessment Criteria for Risk to Plants

Soil contaminants, if present at sufficient concentrations, can have an adverse effect on the plant population. Phytotoxic effects can be manifested by a variety of responses, such as growth inhibition, interference with plant processes, contaminant-induced nutrient deficiencies and

chlorosis (yellowing of leaves). All chemicals are probably capable of causing phytotoxic effects. Thus the phytotoxic potential of substances is dependent on the concentrations capable of having adverse effects on plants and the concentrations likely to be found at contaminated sites. Phytotoxicity is a difficult parameter to quantify given that experimental techniques vary widely and variations exist in plant tolerances, soil effects and synergistic/antagonistic reactions between chemicals.

Contaminants may be taken up and accumulated by plants through a range of mechanisms. The principal pathways are active and/or passive uptake through the plant root, adsorption to root surfaces and volatilisation from the soil surface followed by foliar uptake. After plant uptake, contaminants may be metabolised or excreted, or they may be bioaccumulated.

Many of the substances capable of adversely affecting vegetation exert this effect because of their water solubility, a characteristic that could result in their transport from contaminated sites into adjacent locations where the chemical may generate a phytotoxic response. This could be important if, for example, the adjacent site has important conservation status.

Whilst many contaminants may be phytotoxic, data are limited. Some heavy metals are essential as trace elements for plant growth but may become toxic at higher concentrations. Toxicity may be displayed in many forms, including signs of stress such as reduction in growth or yellowing of the tissue. The concentration in soil at which substances become phytotoxic depend on a range of factors including plant type, soil type, pH, the form and availability of the contaminant and other vegetation stress factors that may be present (such as drought).

Hydrock has carried out a review of a number of current and former guidance documents and other texts on phytotoxicity. It is not possible to produce a definitive list of phytotoxic substances on account of the variables mentioned above. However, a number of metals are repeatedly cited as commonly occurring priority pollutants. As a result, the following list is adopted as Hydrock's indicators of the potential for phytotoxicity: As, B, Cr, Cu, Ni and Zn.

As the CLEA framework is a risk based approach, applied to humans, an alternative strategy is required to assess the risk to plants from substances that are phytotoxic. Reference to published criteria and background concentrations can help put site data into context.

Published assessment criteria for the protection of plant life from a number of countries are given in Table 3.8. Also included in the table are some measures of natural background concentrations in typical soils.

The most authoritative source is the British Standard for topsoil, but this only lists three elements. CLR 11 states that the ICRCL Guidance Note 70/90 can be used for initial screening criteria. This approach has been adopted by Hydrock where BS 3882 is lacking, but where an ICRCL 70/90 criterion is lacking, the lowest criterion in Table 3.8 from, firstly MAFF, and, secondly, another country has been adopted. The adopted criteria are highlighted in Table 3.8. The MAFF value of 250 mg/kg has been chosen for As over the ICRCL value of 50 mg/kg as MAFF explains the 50 is applicable to vegetables and human health, whereas 250 is applicable to the plants themselves.

Table 3.8: Published Assessment Criteria and Natural Background Concentrations for Phytotoxic Elements (mg/kg)

Reference	As	B	Cr (total)	Cr (III)	Cr (VI)	Cu	Ni	Zn
Published assessment criteria (mg/kg)								
British Standard for topsoil (BS 3882:2015)						200 (pH>7) 135 (pH 6-7) 100 (pH 5.5-6.0)	110 (pH>7) 75 (pH 6-7) 60 (pH 5.5-6.0)	300 (pH>7) 200 (pH 6-7) 200 (pH 5.5-6.0)
MAFF Code of Good Agricultural Practice for the Protection of Soil (1998)	250			unlikely to be toxic except in v low pH. 400 for sites containing sewage sludge		500 (grass) but may fall to 250 for clover and sensitive species (at pH≥6)	110 (pH>7) 75 (pH 6-7) 60 (pH 5.5-6.0)	1000 (clover & grass at pH 6), may fall to 300 for sensitive species (at pH 6-7)
Australian Guideline B(1) (1999), Interim Urban Ecological Investigation Level (EIL). Soils not generally considered phytotoxic below these EILs.	20			400	1	100	60	200
Considered toxic to plants - Ponnamperuma *et al* (1979)		5 (hot water soluble)						
Dutch ecotoxicological intervention value (Swartjes 1993 & 1994) *	40	7	230			190		
Alberta Environment (1990) Tier 1 (draft) *	10 acid sandy soils			600 acid sandy soils	25 acid sandy soils	130 acid sandy soils		
Ontario MoE (1989) *	20 acid sandy soils 25 clay soils							
ICRCL 59/83 (1987) now withdrawn for human health assessment		3 (hot water soluble)				130	70	300
ICRCL 70/90 (1990) threshold trigger value	50				25	250		1000
New Zealand guidelines for timber treatment sites (1997), estimated based on Cu bioavailability *						500-1000 clay soils		
New Zealand guidelines for timber treatment sites (1997), soil criteria for protection of plant life (residential/agricultural setting)	10-20	3 (soluble)		600	25	130		

Reference	As	B	Cr (total)	Cr (III)	Cr (VI)	Cu	Ni	Zn
Natural Background Concentrations (mg/kg)								
Dutch background level (target value) (VROM 2000)	29		100			36	35	140
UK ICRCL 42/80 (2nd ed. 1983) - Normal conc. In agricultural soil	0.1-40	2-100	5-500			2-100	5-500	10-300
UK ICRCL 70/90 (1st ed. 1990) - Typical range (and mean) in agricultural soils	2.3 - 53 (11.0)					5.8-62 (19) [1.2-19 4.9) extractable]		29-210 (78.1) [1.5-21 (5.6) extractable]
Canadian assessment criteria (i.e. background) (CCME 1991)	5	1(hot water soluble)	20		2.5	30		60
New Zealand timber sites (1997) – background	2-30							
Australian Guideline B(1) (1999), typical background levels	1-50		5-1000			2-100	5-500	10-300
* cited in New Zealand Ministry for the Environment (1997) timber treatment chemicals guidelines.								

3.14 Generic Risk Assessment Criteria for Controlled Waters

The following aquifer definitions are adopted.

- **Principal aquifers** - These are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.
- **Secondary aquifers** - These include a wide range of rock layers or drift deposits with an equally wide range of water permeability and storage. Secondary aquifers are subdivided into two types:
- **Secondary A** - permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers; and
- **Secondary B** - predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.
- **Secondary undifferentiated** - has been assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type
- **Unproductive strata** - These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow.

The Environment Agency (August 2013) Groundwater Protection Policy (known as GP3) contains the legal framework, detailed policies, technical background and the tools to be used in the protection of groundwater.

The European Water Framework Directive (2000/60/EC) (WFD) and its daughter Directives establish a consolidated way of controlling water quality of the whole water environment. The UK Government has revised its guidance to the Environment Agency and Natural Resources Wales (the Agencies) to remain relevant to the second and subsequent planning cycles. *River basin planning guidance* (Defra and Welsh Government July 2014) is a point of reference for other regulators, bodies and individuals affected by or contributing to the river basin planning process. Parts of this guidance are transposed into The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015, which support The Water Environment (Water Framework Directive) (England and Wales) (Amendment) Regulations 2015 (Statutory Instrument 2015 No. 1623) which came into force on 14 September 2015. This updates the 2003 Regulations to include the revised EQS Directive (2013/39/EU) which has been amended to cover the second planning cycle, starting on 22 December 2015.

Water Framework Directive implementation in England and Wales: new and updated standards to protect the water environment (Defra and Welsh Government May 2014) informs interested parties of the new and updated environmental standards. There are a number of support documents produced by the UK Technical Advisory Group on the Water Framework Directive (UKTAG), including *Updated Recommendations on Environmental Standards* for the 2015-21 river basin management programme.

A groundwater body is defined as groundwater in an aquifer capable of supporting an abstraction of 10 m^3/day or 50 people over a sustained period under the WFD. Groundwater bodies are a strategic resource, even if there is no current abstraction. Lesser amounts of groundwater in an aquifer may not be considered as receptors in their own right, but may still be pathways to other receptors such as surface water bodies or aquatic ecosystems. However, if the conceptual site model indicates a potable supply of less than 10 m^3/day, this source will be included in the risk assessment.

One of the main objectives of the Agencies is to 'prevent or limit' inputs of substances. Substances are defined as either 'hazardous substances' or 'non-hazardous pollutants'. Directive 2006/118/EC include the objective of preventing the input of hazardous substances into groundwater and limiting inputs of other (non-hazardous) pollutants so as to avoid deterioration of the groundwater body. The revised EQS Directive 2013/39/EU Annex I contains a list of 'priority substances' in the field of water policy and includes those identified as 'priority hazardous substances'.

For practical purposes, the Agency interprets prevention of inputs of hazardous substances and any other substances which meet the criteria for persistence, toxicity and bioaccumulation taking into account those substances listed in WFD (2000/60/EC) Annex VIII.

The 'prevent' objective applies to active inputs such as industrial discharges and *de minimus* concentrations are set as a series of minimum reporting values (MRV). Inputs to Controlled Waters from contaminated land sites are classed as passive inputs under the WFD and, as such, were regulated under the Agency's 'limit' objective. However, paragraph 9.3 of the revised *River*

basin planning guidance (Defra and Welsh Government July 2014) states that the governments will issue revised Directions to take into account the recommendations of UKTAG (November 2013, amended January 2014) as well as Directive 2013/39/EU. These recommendations provide approached for hazardous and non-hazardous substances as follows.

- Hazardous substances – standards in groundwater help to assess whether or not measures to prevent inputs from identified sources have been successful and are based on 'limits of quantification' achieved routinely by competent laboratories (also known as minimum reporting values, MRV). Recommended standards are given in Table 13 of the UKTAG document. These standards are recommended for use in assessing risks posed by new developments (such as landfills) and whether or not existing activities and contaminated land with the potential to cause inputs are doing so.

  This is potentially more onerous than the previous 'limit' objective and the UKTAG document states that actions currently taken with respect to contaminated land are not always sufficient to prevent inputs of hazardous substances and additional remediation may be required. However, it also states that exemptions are available where measures would be disproportionately costly.

- Non-hazardous pollutants – standards in groundwater help to assess the extent to which inputs need to be limited to ensure they do not cause deterioration. Standards vary depending on the receptor at risk. Acceptable water quality targets are defined for protection of human health (based on drinking water standards (DWS)) and for protection of aquatic ecosystems (environmental quality standards (EQS)).

In the event, when the revised Directions were issued (namely, The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015) there was no mention of the use of MRVs with respect to inputs from land subjected to contamination. Consequently, MRVs are not used by Hydrock in this report.

All substances which are not determined to be hazardous are potentially non-hazardous pollutants. The final say lies with the Agencies as to which chemicals they consider to be of potential concern and whilst the indicator substances analysed for by Hydrock in this report may be indicative of the likely risk of pollution of Controlled Waters, this report may not be definitive and the relevant Agency may require additional work.

The definition of pollution is "the direct or indirect introduction, as a result of human activity, of substances or heat into the air water or land which may be harmful to human health or the quality of aquatic ecosystems or terrestrial ecosystems directly depending on aquatic ecosystems, which result in damage to material property, or which impair or interfere with amenities and other legitimate uses of the environment."

Pollution equates to harm. In order to protect receptors there is a regulatory regime. This involves setting an environmental standard at the receptor (i.e. minimum acceptable water quality). In recognition that pollutants may degrade *en route* to the receptor it is possible to set a limit value at the source of the pollution and compliance values at locations along the pathway, such that water reaching the receptor does not exceed the environmental standard. By definition, the target value is greater than or equal to the compliance value, which in turn is greater than or equal to the environmental standard, depending on the amount of degradation

expected. This concept is used in the Remedial Targets Methodology (Environment Agency 2006a) to determine how land contamination impacts on groundwater and surface water quality.

The applied environmental standards vary with the hydrogeological conditions and the perceived value of the water resource, and are subject to local assessment by the relevant Agency. Note that protection of Controlled Waters may involve work over and above that required for 'suitable use' of a site for the proposed development.

Note also that Article 6.3(e)(ii) of the WFD enables the regulatory authorities to exempt measures from the prevent and limit requirements where it would be disproportionately costly to remove or control the further movement of pollutants that are already in the ground. Where a continuing source that has given rise in the past to land contamination this must be brought under control to prevent further unacceptable inputs to groundwater, but it is clear that the extent is limited by what is considered to be 'reasonableness'.

This report provides an initial assessment of the risks of pollution of Controlled Waters using water quality targets (WQT) as screening values. These are the drinking water standards (DWS) and the environmental quality standards (EQS), the latter designed to protect the surface water ecosystems. EQS are available for inland surface waters (freshwater) and other surface waters (transitional and marine). In addition, the recommended standards for hazardous substances in groundwater (UKTAG November 2013, amended January 2014, Table 13, Column 2) are also used where appropriate.

DWS are given in the Water Supply Regulations 2010 (which amends to Water Quality (Water Supply) Regulations 2000, Schedule 1, Table B, Part 1 (Directive requirements) and Part 2 (national requirements)). Where no UK or EU drinking water standard exists, reference is made to the World Health Organization (2011).

The list of EQS for priority substances is published in Directive 2013/39/EU. In addition, each Member State has to define country-specific substances and their EQS (river basin specific pollutants). Those adopted by the UK listed by Defra and Welsh Government (May 2014) and the 2015 Directions. These documents form the basis for the DWS and EQS used in this report.

It is noted that the EQS for iron in *Water Framework Directive implementation in England and Wales: new and updated standards to protect the water environment* is given in Table 5.2a as 1 µg/l. The 'standard status' in that table is listed as an existing standard. However, the existing standard was 1 mg/l (i.e. 1000 µg/l) and the tabulated value appears to be an error. This has been carried forward to the 2015 Directions. Consequently, Hydrock continues to use 1000 µg/l in its assessments.

Several EQS are based on bioavailable metal proportions (i.e. copper, lead, manganese, nickel and zinc). For zinc, this is the concentration in excess of the ambient background concentration (ABC). A software tool (M-BAT) is available from the Water Framework Directive - UK TAG web site for calculating the bioavailable fraction of Cu, Mn, Ni and Zn, but not Pb, and it also lists regional ABC values (WFD-UKTAG July 2014). Use of the tool requires knowledge of certain determinants of the receiving waters. Consequently, unless otherwise stated in the report text, this modelling has not been used in Hydrock's initial screening exercise and so an assessment

based on the total dissolved metal concentrations will be conservative and a further level of risk assessment may be required.

Where this tool has been used, the bioavailability has been taken into account by calculating site-specific $PNEC_{dissolved}$ (Predicted No Effect Concentration) values. These enable the dissolved concentration data to be compared with the PNEC as if it were an EQS.

The WFD imposes a duty on the Agencies to classify surface water and groundwater bodies and to ensure long-term improvement (where necessary) to achieve acceptable standards. Threshold Values (TV) for individual groundwater bodies (GWB) are published. Each GWB has been identified by the Agencies and specific TVs calculated based on the perceived risks to that GWB. Failure of a TV is an indicator of potential adverse impact in specific circumstances. These TVs are not intended to be applied to meet the 'prevent or limit' objective of the Agencies (UKTAG September 2008) and are not to be used as part of specific site investigations (The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015) and they are not used by Hydrock in this report.

Generic criteria for contaminated soils which might result in groundwater contamination can be derived from generic assumptions using the Environment Agency (2006) Remedial Targets Methodology. A tiered approach is detailed in this document. In accordance with CLR 11, EQS and DWS can be used as generic water quality targets with respect to contamination of controlled waters.

It is clearly not cost-effective to analyse every water sample for all determinands. Hydrock has produced a default *de minimus* suite which includes a number of common water quality indicators plus a selection of the more common chemicals of potential concern, drawn from the lists of Specific Pollutants and Priority Substances / Priority Hazardous Substances plus additional common contaminants listed in the EPA-H1 Part 2 document, as being indicators of Good water quality under the terms of the Directive.

In addition to this, Hydrock will add to this list any chemicals identified as potential risks by reference to the conceptual site model.

Using the WQTs discussed above, the risks to groundwater and surface water from contaminants on site have been assessed according to the remedial targets methodology (RTM) prescribed by the Environment Agency (2006a).

The Level 1 soil zone assessment considers whether the contaminant concentrations in the soil moisture are sufficient to impact the water receptor(s). It is a conservative model and compares soil pore water concentrations with the above criteria, taking no account of dilution, dispersion or attenuation. Pore water concentrations can be estimated by analysis of perched water samples, analysis of eluates produced in the laboratory by standard leaching of soil samples, or by calculation from physico-chemical properties of the substances. Calculation may be more appropriate for poorly soluble substances where retention times may not be long enough during the standard leaching tests to reach equilibrium. However, the Environment Agency (2009d) cautions that the use of published k_d values to calculate pore water concentrations "can lead to a conservative estimate of risk" and suggest that leaching tests may be designed for non-volatile organics using BS 18772:2008.

The Level 2 groundwater assessment is applicable where groundwater quality data are available and compares these with the above criteria, again taking no account of dilution, dispersion or attenuation.

The remedial targets methodology also allows for more detailed assessment (soil Level 2, 3 or 4, or groundwater Level 3 or 4) for substances which fail the above-mentioned assessments. These are progressively more complex assessments and do take into account attenuation and/or dilution, as applicable to the conceptual exposure model. Such assessment is beyond the scope of this report.

Where more than one water quality target is available it is important to apply the one relevant to the critical receptor. The DWS apply to groundwater or to surface water used for abstraction and the EQS apply to surface water where the aquatic ecosystem is the receptor. EQS are available for *inland* surface waters (freshwater) and *other* surface waters (transitional and marine). Where the most appropriate water quality target cannot be determined with certainty, the lowest one is adopted in line with the precautionary principle.

For the purposes of this report, the site data are compared with the various targets as set out in Table 3.9

Table 3.9: Summary of Water Quality Risk Assessment Protocol

Scenario	Water body Receptors	Secondary Receptors	Example Contaminant Linkages	RTM Level and Samples Used (if Available)	Water Quality Targets
A	Groundwater.	Human health (abstraction).	Contaminants from site leach or seep into groundwater body and this is a (potential/actual) source of human consumption or a strategic resource.	RTM Level 2 - Groundwater. RTM Level 1 - Soil leachate (including any calculated pore water concentrations) or pore water.	DWS
A	Groundwater. Surface water.	Human health (abstraction).	Contaminants from site leach or seep into groundwater body and this feeds surface water by base flow. The surface water may be used for human consumption.		DWS
B	Groundwater. Surface water.	Aquatic ecosystem.	Contaminants from site leach or seep into groundwater body and this feeds surface water by base flow. The surface water may be an aquatic ecosystem.		EQS (inland)
C	Groundwater. Surface water.	Aquatic ecosystem.	Contaminants from site leach or seep into groundwater body and this feeds surface water by base flow. The surface water may be an aquatic ecosystem.		EQS (other)
D	Groundwater. Surface water.	Human health (abstraction). Aquatic ecosystem.	Contaminants from site leach or seep into groundwater body and this feeds surface water by base flow. The surface water may be used for human consumption and is an aquatic ecosystem.		DWS EQS (inland)

Scenario	Water body Receptors	Secondary Receptors	Example Contaminant Linkages	RTM Level and Samples Used (if Available)	Water Quality Targets
E	Surface water.	Human health (abstraction).	Contaminants from site leach or seep into surface water which may be used for human consumption.	RTM Level 1 - Soil leachate (including any calculated pore water concentrations) or pore water. Although not part of the RTM, these scenarios are used to compare surface water data to the water quality targets.	DWS
F	Surface water.	Aquatic ecosystem.	Contaminants from site leach or seep into surface water which may be an aquatic ecosystem.		EQS (inland)
G	Surface water.	Aquatic ecosystem.	Contaminants from site leach or seep into surface water which may be an aquatic ecosystem.		EQS (other)
H	Surface water.	Human health (abstraction). Aquatic ecosystem.	Contaminants from site leach or seep into surface water which may be used for human consumption and is an aquatic ecosystem.		DWS EQS (inland)

Notes:
Some EQS are water hardness dependent. This is measured either in the receiving water or in groundwater (if it is part of the pathway), or is estimated from national maps.
Inland waters EQS applicable to freshwater, other waters EQS applicable to marine or transitional waters.
Where both DWS and EQS are applicable, it is assumed that the EQS is for inland waters.
This table and the results of the assessment are considered as a first screening for potential risks of pollution of Controlled Waters. More specific requirements may be stipulated by the Environment Agency.

Note that in some instances the reporting limit (or detection limit) quoted by the laboratory may be greater than the water quality target that it is being assessed against. Where this is the case it is noted in the table. The current exercise is an initial screening assessment.

There are three main possible reasons for this. Firstly, it may be that the 'standard' method gives a relatively higher reporting limit, but that a lower one could be obtained using a more specialised technique. However, it would be disproportionately expensive to adopt the more costly specialist technique for this initial screening exercise. Secondly, it may be that the sample in question was not 'clean' because the matrix was contaminated by other substances which interfere with the analysis and so a less sensitive method has been used to protect the laboratory equipment. Thirdly, it may be that no method exists that can reach the required limit. Hydrock has contacted the Environment Agency's own National Laboratory Service and even they cannot reach low enough limits for several of the substances in the Hydrock default suite (Cr(VI), total cyanide, phenols and certain PAHs). Consequently, and depending on the particular chemicals, it may be possible with additional effort to refine the assessment, or it may be the case that it is not possible to say for certainty because suitable techniques are not available. Methods are being continually updated and new ones may become available.

The problem is compounded when EQS are revised downwards (eg the PAHs in 2013/39/EU Annex II) on the basis of toxicology, but laboratory techniques have yet to catch up. Indeed, the Directive acknowledges this in the revised Article 3b and where it states "... measurement, when carried out using the best available technique not entailing excessive costs, is referred to as "less than limit of quantification", and the limit of quantification of that technique is above the EQS, the result for the substance being measured shall not be considered for the purposes of assessing the overall chemical status of that water body."

In some cases all samples are below the detection limit but above the water quality target. It is not possible to make any judgement about these. However, in other cases, even though the detection limit is greater than the water quality target, some sample results do exceed the target.

3.14.1 Petroleum Hydrocarbons in Water

With respect to hydrocarbons in water, the Water Supply (Water Quality) Regulations 1989 (as amended 1999) contained a prescribed concentration of 10 µg/l for "dissolved or emulsified hydrocarbons (after extraction with petroleum ether); mineral oils". This was removed from the 2000 (consolidated 2007) Regulations. It was confirmed by email from the Drinking Water Inspectorate to Hydrock (1 November 2005) that dissolved hydrocarbons are no longer a prescribed substance under the Regulations. However, the 10 µg/l limit did remain in the Private Drinking Water Regulations 1991 until their revision at the end of 2009.

In the absence of a prescribed concentration for drinking water, many Environment Agency officers continue to use the superseded value. This is perhaps because petroleum hydrocarbons are a hazardous substance (former List 1) under the WFD. There is, however, no clear UK policy on hydrocarbon contamination of controlled waters. This is partly because analyses for 'petroleum hydrocarbons' are fraught with complications concerning false positives, the results being method dependent and not restricted to petroleum products.

Guidance written by the Environment Agency on risk assessment of hydrocarbons in groundwater is dated 2009 but has never been officially released through the Agency's website, although the dissemination status of the document is given as publicly available. This gives a table of water quality targets for hydrocarbons and lists "TPH (dissolved or emulsified hydrocarbons)". No minimum reporting value (MRV) is quoted, the value that would equate to a *de minimus* concentration under the prevention objective. The target of 10 µg/l is given and this is described as coming from the "Private Water Supply Regulations 1991 No. 2790 (due to be updated in 2009)". As mentioned above, the 2009 Regulations no longer list dissolved hydrocarbons.

Furthermore, the guidance also states that in cases where petroleum hydrocarbons have already entered the water, the Agency will regulate under its limit objective, rather than the prevention objective. This means that EQS or DWS will be appropriate. However, none exist.

In the absence of definitive guidance on petroleum hydrocarbons in water Hydrock recognises that it is not possible to provide EQS and so regulation with respect to aquatic ecosystems is impossible. However, it is possible to extend the use of DWS by calculating screening criteria for the speciated TPH fractions. This provides a rational, transparent and risk-based approach using established scientific principles, rather than simply adopting a withdrawn standard.

Whilst not strictly applicable to aquatic ecosystems, at least this approach can help inform the judgement as to the degree of degradation of a water body.

Accordingly Hydrock has calculated guidelines for drinking water quality based on the methodology proposed by the World Health Organisation (WHO, 2005). This is based on an adult consuming 2 litres of water per day. Whereas the WHO document assumes a body weight of 60kg, Hydrock has assumed 70kg in keeping with the UK Contaminated Land CLEA methodology.

A conservative allocation of 10% of the oral Tolerable Daily Intake (TDI) has been attributed to intake from drinking water. It is noted by the WHO (2005) that exposure from other sources would be expected to be very small and that it would be possible to allocate a greater percentage to drinking water if required. In other words, this approach is very conservative and is appropriate as an initial screening value and allows for potential additive toxicity and simultaneous exposure from other sources.

The TDIs used are the same as those used in the derivation of soil GACs and are listed in Table 3.10 along with the calculated health-based water quality targets for drinking water. Note, however, that the Environment Agency (2009d) states that when considering carbon bands, one does not know the range of toxicities and health effects of the individual chemicals, and it is precautionary to assume that the toxicological effects are additive when setting water quality targets even though the toxic endpoints and modes of action might in reality be quite different. The recommendation is to adopt a precautionary approach whereby the water quality target for each band is divided by the number of bands with detected concentrations.

Table 3.10: Calculated Water Quality Targets for Petroleum Hydrocarbons in Drinking Water

Determinand	TDI (µg/kg/day)	Solubility (µg/l)	Water Quality Target (see Note 1) (µg/l)	Notes
Ali EC5-EC6	5000	35900	**17500**[1]	
Ali >EC6-EC8	5000	5370	**17500**[1]	This concentration would be significantly above the solubility in water.
Ali >EC8-EC10	100	427	**350**[1]	
Ali >EC10-EC12	100	33.9	**350**[1]	This concentration would be significantly above the solubility in water.
Ali >EC12-EC16	100	0.759	**350**[1]	This concentration would be significantly above the solubility in water.
Ali >EC16-EC44	2000	0.00254	**7000**[1]	This concentration would be significantly above the solubility in water.
Aro EC5-EC7	223	1780000	**1**[1]	Based on the TDI for toluene as recommended by Environment Agency (2005) P5-080/TR3 gives 780. In reality the UK DWS for benzene = **1** takes precedence.
Aro >EC7-EC8	223	590000	**700**[1]	Calculated as 780, WHO DWS = **700** takes precedence.
Aro >EC8-EC10	40	64600	**140**[1]	
Aro >EC10-EC12	40	24500	**140**[1]	
Aro > EC12-EC16	40	5750	**140**[1]	
Aro >EC16-EC21	30	653	**105**[1]	
Aro >EC21-EC44	30	6.61	**105**[1]	This concentration would be significantly above the solubility in water.
Benzene	n/a	1780000	**1**	Calculation not possible as non-threshold substance, UK DWS = **1** takes precedence.
Toluene	223	590000	**700**	Calculated as 780, WHO DWS = **700** takes precedence.
Ethylbenzene	100	180000	**300**	Calculated as 350, WHO DWS = **300** takes precedence.
Xylene	180	200000	**500**	Calculated as 630, WHO DWS = **500** takes precedence.
MTBE	300	48000000	**15**	Calculated as 1050 so the odour threshold = **15** is adopted.

Determinand	TDI (µg/kg/day)	Solubility (µg/l)	Water Quality Target (see Note 1) (µg/l)	Notes
Note 1: The value to be used in a risk assessment (for carbon bands) is the value in the table divided by the number of bands with detected concentrations. Last updated 29/06/10				

In instances where a simple 'total' TPH is reported for water samples this should be considered indicative only. This is particularly the case if groundwater or surface water samples were not available and an indication of pore water quality has been derived by subjecting soil samples to a standard leaching procedure or calculation.

Where petroleum hydrocarbon contamination of Controlled Waters is suspected, Hydrock recommends that discussion with the Environment Agency is entered into at the earliest opportunity.

3.15 Statistical Tests of Soil Contamination Results

As discussed above, the sample analyses are divided into representative data sets for the assessment, based on the conceptual site model, and are referred to as 'averaging areas'. In this case it has been chosen to characterize materials that are likely to form the ground cover in critical receptor areas (e.g. gardens), on a material by material basis. The critical part of the soil column is the upper metre in terms of contact with end users of a development site.

Under the **land use planning system** where the aim is to demonstrate 'suitability for use' the key question will usually be "can we say confidently that the level of contamination of this land is low relative to some appropriate measure of risk, sometimes referred to as the critical concentration?" The critical concentration can be, for example, the relevant GAC.

It is necessary to demonstrate that (for each contaminant) the mean concentration on the site is **below** the critical concentration. The true mean concentration of a contaminant is not known because all the site soil has not been tested. An estimation of the true mean can be obtained from the samples tested during the investigation. The greater the number of samples tested, the closer the mean of these values is to the true mean.

In practice, this involves calculation of a quantity known as the 95th Upper Confidence Limit (UCL) of the true population mean, also known as the US_{95}. This is the estimate of the true mean at a 95% level of confidence (i.e. there is a 95% probability that the true mean will not be greater than this, given the values obtained from the investigation sample testing).

The statistical test that is carried out, therefore, is used to demonstrate that there is a 95% probability that the true mean falls below critical concentration (typically the GAC in a screening exercise).

In statistical language, a **null hypothesis** is stated; that the level of contamination is the same as, or higher than, the critical concentration. The **alternative hypothesis** is that the level of contamination is lower than the critical concentration. The statistical test is used to decide whether or not the null hypothesis is rejected.

If it is rejected, the assessor can conclude that the alternative hypothesis is more likely to be true, i.e. that contaminant concentrations are low relative to the critical concentration and that, potentially, the land is suitable for use. Conversely, if the null hypothesis is not rejected, the assessor should conclude that contaminant concentrations may be the same as, or higher than, the critical concentration and further measures may be needed.

A useful summary of the methodology is provided by CIEH & CL:AIRE (May 2008), which forms the basis for the approach adopted by Hydrock, and is described below. Appendix I of the C4SL report SP1010 (CL:AIRE, December 2013) contains a review of this methodology.

Firstly, the data set is assessed for outliers and normality. This is mainly a visual exercise rather than following a particular statistical method. Two graphs are considered, the data frequency histogram with a normal 'bell curve' for comparison and a quantlie-quantile (q-q) plot. The closer the data points lie to the 45° line, the closer they are to a normal distribution. Kinks in the q-q plot are indicative of more than one data set. Individual points away from the 45° line are indicative of outliers.

Additional evidence of outliers is obtained through a simple method of robust statistics advocated by the Royal Society of Chemistry (2001) and others. The measure of the mean is taken to be the median value because this is less susceptible to outliers and non-normal data sets. A value known as the mean absolute deviation (MAD) is calculated and from this can be calculated a robust standard deviation estimate by multiplying by 1.483.

A z-score can then be calculated, which is the absolute value of the data value minus the median, divided by the robust standard deviation. This is then compared with a critical value which, if exceeded, suggests a possible outlier. The critical value represents the number of standard deviations from the mean (or in this case the median). A critical value of 3 to 3.5 is generally considered appropriate. The attraction of this approach is that it is a robust, non-parametric method suitable for all data sets. It is not considered as definitive, but merely a tool to aid decision making.

If a potential outlier is identified it could be a laboratory or typographic error. If this is not the case it could be representative of a different contaminative incident and, therefore, be a hot-spot. However, it could also be simply the result of heterogeneous ground conditions and a relatively low number of sampling points. The initial review of the data is then coupled to a knowledge of the conceptual site model before an outlier is removed from the data set. A good reason is required to justify the removal of outliers and this will be reported in the text.

The second stage of the assessment is to carry out the statistical test as described previously. Two alternative methods are highlighted in the CIEH/CL:AIRE document. The one-sample t-test is said to be appropriate for normally distributed data (it is a parametric test) but is not sensitive to moderate departures from normality. The Chebychev Theorem is a non-parametric test which is said to be suitable for all data distributions. It is a less powerful test (statistically) and gives a more cautious result than the t-test because there is less certainty about the shape of the distribution.

The CL:AIRE review of 2013 considers the use of the t-test in more detail and states that if enough samples have been taken the distribution that describes the uncertainty about the mean depends only on the mean concentration and the size of between-location variation (as

measured by the observed standard deviation, not the shape of the variation. The review goes on to say that in certain circumstances, the use of the Chebychev Theorem may be unsound and suggests the use of statistical tests not based on the null hypothesis test.

The method of determining when there are enough samples to be able to use the t-test is based on the condition that the relative standard error (RSE) is less than 0.25. The RSE is calculated from the relative standard deviation (RSD) by dividing my the square root of the number of samples. The RSD is the standard deviation divided by the mean. The number of samples required for an unbiased estimate of the average concentration are listed in Table 2 of Appendix I of SP1010, for various values of RSD and based on RSE of 0.25. The number of samples required and the RSE are calculated for each chemical on the Hydrock statistics spreadsheet and a note appears as to whether or not the t-test is applicable on this basis.

The risk assessor ultimately decides, based on all the evidence, whether to use the t-test (by selecting the data as being treated as normally distributed) or the Chebychev Theorem (data treated as non-normal). The chosen method is applied and the outcome recorded with respect to whether or not the null hypothesis is rejected and the site is potentially suitable for use.

Please note that under certain circumstances a 'divided by 0' error can occur in the spreadsheets used in the statistical analyses. This happens when all the data points are the same integer value, for example where all results are <3 mg/kg and they have been assumed to be 3 mg/kg. To prevent this error, one of the results can be altered by a small amount (e.g. 3 becomes 2.99999). This allows the statistical tests to be carried out but makes no difference to the outcome. However, it does mean that the q-q and histogram plots show a spurious point, which should be ignored.

It should be noted that a similar, but opposite, set of propositions applies in the case of a potential Part 2A determination where the level of contamination must be higher than some appropriate level of risk (critical concentration) (e.g. that indicative of SPOSH). In this case, however, a lower standard of proof may be accepted and the guidance suggests that if the statistical test of significance at the 95% confidence level does not indicate rejection of the null hypothesis, then the test should be repeated at the 51% level to see if there is evidence to suggest the null hypothesis be rejected on the balance of probabilities. Where no SPOSH concentrations are available and, say C4SLs, are being used as a low-level screen under Part 2A, the same approach as for the planning regime is appropriate.

When considering potential Part 2A sites, updated guidance published by Barnes *et al* (2010) recommends the t-test for all data sets where exceedance of a critical concentration is being tested (unless the data are negatively skewed, something these authors have never seen in contaminated land data sets).

3.15.1 Note on Clustered Data Sets

The assumption behind the statistical tests is that each sample represents an equal fraction of the averaging area (Nathanail, 2004). If the data are clustered, i.e. the sampling points are not equally spaced, the calculated US_{95} would be too high if targeted sampling has taken place around suspected high concentration areas to determine the extent of the high contamination. Conversely, the calculated US_{95} would be too low if there is a high density of sampling in an area of low contaminant concentration.

The sampling pattern used in this report has been reviewed to determine if clustering of data points is likely to affect the statistical tests significantly. In cases where the area represented by each sample is judged to be similar, the tests have been carried out without modification. The error in this approach is likely to be conservative to human health because the Hydrock approach to targeted sampling is more likely to produce more closely spaced higher concentrations than more closely spaced lower concentrations.

Erring on the conservative side is, however, counter-productive when it would indicate unnecessary remediation, i.e. remediation triggered by a US_{95} which is skewed by clustered data. This is taken into consideration in the risk evaluation part of the risk assessment exercise and can take the form of professional judgement, the modification of the averaging area datasets to decluster them, or the weighting of sample results to decluster the data set. The latter method involves weighting the measured concentrations according the proportion of the area they represent, giving greater weight to samples representative of a larger area.

3.15.2 Statistical Tests and Risk to Controlled Waters

Where only a few water quality tests are available, the maximum concentrations are compared with the standards because the 95 percentile will be close to the maximum value. However, where a larger population is available, the 95 percentile is compared with the standards, as recommended by the Environment Agency.

3.16 Ground Gas Risk Assessment

The permanent ground gases methane (CH_4) and carbon dioxide (CO_2) are monitored in accordance with the principles of BS 8576:2013 and the site records are reported in an appendix. Instrument calibration records are kept in accordance with Hydrock's in-house protocol for ground gas monitoring.

The risks associated with the methane and carbon dioxide are assessed using BS 8485:2015 and guidelines from CIRIA (Wilson *et al* 2007), the NHBC (Boyle and Witherington 2007) and CL:AIRE RB17 (Card *et al* 2012).

In the above guidance, 'Situation B' is defined as the specific development of low-rise (1 or 2 storey) housing with beam and block floors, vented sub-floor void and gardens. Initial risk classification can be made according to NHBC Table 8.1. This determines the appropriate risk strategy for protection, including the need to progress to generic quantitative risk assessment (GQRA). Even where no risk assessment is recommended by this table, one may be carried out if so desired. The GQRA is known as the 'NHBC traffic light classification' as it uses red, amber and green designations to portray levels of risk.

'Situation A' covers all other forms of development. This uses a modified version of the Wilson and Card (1999) methodology.

The idealised frequency of monitoring is suggested in CIRIA Tables 5.5a and 5.5b. These tables are adapted from Wilson and Haines (2005) Table 3 which gives examples of ground conditions with the various gas generation potentials, ranging from inert Made Ground (very low potential) to post 1960s domestic landfill (very high potential).

The report does not constitute a design for gas protection measures, but lists the recommendations given by the above-mentioned guidance for the particular "Situation" considered relevant. Reference should be made to BS 8485:2015 which provides guidance for the design, based on a system of scoring depending on the type of building, the type of structural barrier, ventilation protection measures and the gas membrane. The design of gas protection measures according to BS 8485:2015 requires the building(s), or different parts thereof, to be categorized into one of four building types: Type A, Type B, Type C or Type D. This is because the construction and use of the building, together with the control of future structural changes to the building and its maintenance (the building's management) should be assessed, since potential risks posed by ground gases are strongly influenced by these factors. Note that if a membrane is installed it must be verified in accordance with CIRIA C735 (Mallet *et al* 2014) or it will score zero points and will not be deemed to afford any protection.

CL:AIRE RB17 (Card *et al* 2012) is a pragmatic approach to ground gas risk assessment and was developed because gas concentration, pressure and flow rate measured in a well headspace may not be representative of the conditions in the surrounding formation. This approach is endorsed in BS 8485:2015. This is particularly the case where landfill or mine gases are not present, but there is scope for gas generation from Made Ground or naturally occurring organic matter in the soil. If generation rates are low, relatively high concentrations may be present in the soil pores but there is no driving force to expel gases at sufficiently high fluxes so as to represent a risk by entering enclosed living spaces.

In these low risk situations, the approach is to use the conceptual site model and the estimation of the likely gas generation from a source to identify:

- where gas monitoring is required to better define the risks;
- where it may be appropriate to reduce the period of monitoring required (or avoid extra monitoring in response to anomalous results); or
- gas protection measures where the total organic content (TOC) is not greater than 6%.

In summary:

Natural soils only with no credible methane source:

- no action required (monitoring or gas protection measures) as this represents Characteristic Situation 1 (CS1).

Natural soils with peat/organic alluvium or Made Ground with low organic content and a radon barrier is being provided:

- no action required (monitoring or gas protection measures).

Natural soils with peat/organic alluvium or Made Ground with low organic content and a radon barrier is *not* being provided:

- no gas monitoring required;
- if peat/organic alluvium is present this represents CS2 (note Table A1 in RB17 reads CS3 and this is an error according to Wilson (pers. Comm.);

- if Made Ground is present, is less than 1 m thick and is inert material such as sub-base of mineral soils no gas protection is required as this represents CS1;
- if Made Ground is present, is less than 5 m (maximum) and less than 3 m (average) thick determine TOC and forensic description (Table 3.11) and Characteristic Situation (and hence gas protection measures) (Table 3.12);
- if Made Ground is present, is greater than 5 m thick (for example and 'old refuse tip' on the Ordnance Survey map) determine Characteristic Situation (and hence gas protection measures) from TOC with forensic description plus gas generation modelling and gas monitoring to provide a lines of evidence approach. The findings of the TOC and gas modelling may mean gas monitoring for a period shorter than recommended by CIRIA.

Table 3.11: TOC and Forensic Description

Made Ground Fraction	TOC (%)
Fine soil <10mm organic	Laboratory test for TOC
Fine soil <10mm inorganic	Zero (inert) or confirm TOC with lab test
Coarse inert – clinker, gravel, concrete, brick etc.	Zero (inert)
Wood, trees, branches etc.	57 (=IPCC (2006) DOC of 43% x 1.33 according to Hesse (1971))
Vegetable matter	27 (=IPCC (2006) DOC of 20% x 1.33 according to Hesse (1971))
Metal, glass, ceramic and other inert matter	Zero (inert)
Paper and card	53 (=IPCC (2006) DOC of 40% x 1.33 according to Hesse (1971))
Other degradable matter	Food: 20 (=IPCC (2006) DOC of 15% x 1.33 according to Hesse (1971) Nappies: 32 (=IPCC (2006) DOC of 24% x 1.33 according to Hesse (1971) Construction / demolition waste: 5 (=IPCC (2006) DOC of 4% x 1.33 according to Hesse (1971)
Cloth and leather	32 (=IPCC (2006) DOC of 24% x 1.33 according to Hesse (1971))
Total TOC for the sample	**Weighted average of above based on mass of fractions**

Table 3.12: Characteristic Situation Based on TOC of Made Ground Maximum 5 m Thick, Average 3 m Thick

Maximum TOC (%) Made Ground in Place for 20 years or Less	Maximum TOC (%) Made Ground in Place for More Than 20 years	Characteristic Situation (CIRIA C665)
≤ 1.0	≤ 1.0	CS1
≤ 1.5	≤ 3.0	CS2
≤ 4.0	≤ 6.0	CS3
Not applicable for >CS3. Gas monitoring required if TOC > 4% (or 6% in old Made Ground)		

In a scenario where Made Ground is greater than 5 m thick the gas generation potential can be calculated according to the equation on page 10 of RB17, but ignoring the summation as no iteration is required if no new Made Ground is placed every year (Wilson, pers. comm.). The equation comes from LTGN03 (Environment Agency 2004c) and was originally developed to calculate the gas generation potential of landfill sites based on iterations representing the amount of waste deposited year by year. The rate constants (half-life) Hydrock uses as default

are the fast, medium and slow degradation waste types from LTGN03 (viz 0.185/yr, 0.1/yr and 0.03/yr, respectively).

The result of the above calculation is assumed to represent the surface emission rate from a given area and mass of degradable Made Ground. This can be converted into a borehole emission rate (rounded up to the nearest 0.5%) for comparison with CIRIA C665 by assuming one borehole is equivalent to 10 m^2 of ground surface (Pecksen 1986).

Furthermore, the above calculated surface emission rate can be used with the equations from the NHBC Appendix F (Boyle and Witherington 2007) to estimate gas content in as house and compare this with the permissible concentrations.

4.0 WATER SUPPLY PIPES

The current guidance on selection of materials for potable water supply pipes to be laid in contaminated land is contained in a document published jointly by Water UK and the Home Builders Federation (Water UK HBF 2014). The protocols in that document are for guidance and are not subject to enforcement by Water UK or any agency, but have been adopted by Water UK and by HBF as best practice for their members. It has been produced to replace the guidance published by UK Water Industry Research (UKWIR) (Report 10/WM/03/02 and reissued in 2010), which came under criticism from contaminated land specialists. Accordingly this guidance is used in the following assessment.

The contaminants are divided into a number of 'parameter groups'. Threshold values for a selection of organic contaminants that may have a detrimental effect on pipes and fittings, together with threshold values for certain parameters that could cause corrosion of metal pipes, are presented.

It is generally accepted that the UKWIR document contains a number of technical errors and inconsistencies and was not universally accepted (AGS June 2014). The Water UK guidance document states that UKWIR Tables 3.1 and G1 are "not considered a definitive guide" and replaces these with its own Table 1 which clarifies the guidance. This is reproduced as within Table 4.1 below and although not stated in the document, it is assumed the units are mg/kg.

With respect to VOCs it is not clear whether or not BTEX and MTBE are to be included within the total VOC category. They appear in the USEPA method 8260C list of priority pollutants, but the text does not say to exclude them from the VOC total even though there is a separate group for BTEX and MTBE. The text does specifically exclude certain sub-sets of the SVOC list and so Hydrock has taken the guidance at face value and includes BTEX and MTBE in the VOC total.

Table 4.1: Water UK Threshold Values for Water Pipes

Parameter Group	Testing Required?	PE Pipe Threshold (mg/kg)	Metal or Barrier Pipe Threshold
Total VOC Sum of all USEPA 8260C VOC >10ug/kg and TIC >20ug/kg	Where preliminary risk assessment has identified land potentially affected by contamination	0.5	No limit
Total BTEX and MTBE		0.1	No limit
Total SVOC Sum of all USEPA 8270D SVOC >10ug/kg and TIC >20ug/kg but excluding PAH and those substances marked with an asterisk below.		2	No limit
TPH >EC5-EC10		2	No limit

Parameter Group	Testing Required?	PE Pipe Threshold (mg/kg)	Metal or Barrier Pipe Threshold
TPH >EC10-EC16		10	No limit
TPH >EC16-EC40		500	No limit
Phenols* from SVOC analysis		2	No limit
Cresols* and chlorinated phenols* from SVOC analysis		2	No limit
Ethers*	Only where identified from former land use	0.5	No limit
Nitrobenzene*		0.5	No limit
Ketones*		0.5	No limit
Aldehydes*		0.5	No limit
Amines*		Nothing >LoD	No limit
Corrosive indicators, pH, conductivity EC and redox potential Eh	Where metal pipes are contemplated	No limit	Wrapped steel: corrosive if pH<7 and EC>400uS/cm. Wrapped ductile iron corrosive if pH<5, Eh not neutral and EC>400uS/cm. Copper: corrosive if pH<5 or >* and Eh positive.
Presence of liquid free phase hydrocarbons	Observation	None allowed	None allowed

Within the guidance the soil tested must be representative of that in which the pipes will be laid, be it existing ground, remediated ground or imported soil, and should be sampled to at least 0.5 m below the underside of the pipe and along the pipe runs with sufficient number of samples to satisfy sampling strategies set out in CLR 4, CRL 11 and P5-066/TR. Following this, the data are to be incorporated into a specified risk assessment methodology.

Note that, unless stated otherwise, the Hydrock report does not constitute a formal water pipe risk assessment. Rather, the findings of the standard site investigation are screened against the threshold values in Table 4.1 insofar as is practicable given the data availability to give an indication of the possible restrictions to the use of plastic water pipes.

Note that the use of barrier pipe (PE-Al-PE) is applicable for all brownfield sites according to the guidelines, unless there are liquid free phase hydrocarbons present.

Note also that the Water UK guidance also includes greenfield sites where the preliminary risk assessment indicates there is a potential for contamination to be present.

The Water UK guidance above concentrates on direct contact of pipes with contaminated soil. It also refers to contact with excessive vapour phase and contaminated groundwater, but does not define either of these nor give any threshold concentrations.

The guidance also cautions against the creation of new pathways during construction, mainly the ability of contaminated groundwater to flow into granular pipe bedding.

It is **strongly recommended** that site-specific approval of the materials for underground pipes to be used for water supply be obtained from the water company that will be supplying this site and/or adopting the pipe work.

5.0 FLOOD RISK

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6.0 WASTE MANAGEMENT

6.1 Introduction

Any material excavated on site may be classified as waste and it is the responsibility of the holder of a material to form their own view on whether or not it is waste. This includes determining when waste that has been treated in some way can cease to be classed as waste for a particular purpose.

One of the ways this can be achieved is set out in the Development Industry Code of Practice (CoP) (CL:AIRE, March 2011). This builds on the Environment Agency guidance document Definition of waste: developing greenfield and brownfield sites (2006b).

The handling, re-use or disposal of waste is regulated by the Environment Agency. The Agency will take into account the use of the CoP in deciding whether to regulate materials as waste. If materials are dealt with in accordance with the CoP, the Agency considers that those materials are unlikely to be waste at the point when they are to be used for the purpose of land development. This may be because the materials were never discarded in the first place, or because they have been submitted to a recovery operation and have been completely recovered so that they have ceased to be waste.

Further details are provided in the CoP.

The chemical analyses in this report were scheduled for the purposes of risk assessment with respect to human health, plant life and controlled waters as discussed in the report. Whilst the results may be useful in applying the Hazardous Waste Assessment Methodology given in Environment Agency Technical Guidance WM3, they are not primarily intended for that purpose and additional analysis may be required should waste classification be required for consideration of off-site disposal of contaminated soils. As part of the report, Hydrock may have undertaken a preliminary exercise to characterise the soils encountered in the investigation in order to inform the waste characterisation process. This has been undertaken using a proprietary web-based tool and in not necessarily identical to the assessment that could be made by a particular landfill operator.

Separate analyses are required to meet the Waste Acceptance Criteria for specific landfill sites.

6.2 Classification of Materials for Off-Site Disposal Purposes

With respect to the possible waste streams from a site, it is recommended that a phased approach is implemented. This phased approach comprises Waste Characterisation and Waste Acceptance Criteria.

6.2.1 Waste Characterisation

Background

All wastes going to landfill must be classified as ‘inert’, ‘non-hazardous’ or ‘hazardous’, with a sub-category of hazardous waste known as ‘stable non-reactive hazardous waste’. Individual landfill sites must operate in accordance with their Environmental Permits.

Basic Characterisation

The first step is to determine if a waste is hazardous or non-hazardous.

Contaminated soil is a 'mirror entry' in the Consolidated European Waste Catalogue, and is not necessarily a hazardous waste. It is only classified as hazardous if it contains dangerous substances above certain threshold concentrations. The Environment Agency document *Waste Sampling and Testing for Disposal to Landfill* (March 2013) suggests that waste holders should use the information collected as part of the contaminated land risk assessment to inform decisions as to the concentrations that might reasonably be expected to be present in the contaminated soil, given the past and current uses of the site.

The waste must be assessed against all the appropriate hazards in accordance with the Environment Agency Technical Guidance WM3. This makes certain worst case assumptions about the chemical composition if specific compounds are not analysed for.

The classification of the soils as waste in England and Wales is undertaken in accordance with the revised Waste Framework Directive (WFD) (2008/98/EC).

Defining the class of waste is carried out on the actual waste being disposed of and the destination landfill site will have the final decision on acceptability of the waste. Therefore, it is recommended that if soils are to be removed from the site, the appointed contractor should approach a landfill site with the available chemical data and seek a formal waste characterisation.

The waste characterisation in this report is for information purposes only and should be considered in the light of the final decision made by the landfill site.

6.2.2 Waste Acceptance Criteria

If the waste is destined for landfill, the second step is Waste Acceptance Criteria (WAC) testing to determine if the receiving landfill can accept the waste. Further sampling and testing may be required.

WAC testing must be carried out on waste classified as non-hazardous to check if it can be disposed of at an inert landfill. Otherwise, it can be disposed of at a non-hazardous landfill without WAC testing.

WAC testing must be carried out on waste classified as hazardous to check if it can be disposed of at a hazardous landfill (or in a special stable non-reactive hazardous waste landfill site/cell).

The WAC are a list of limit values for certain parameters obtained from total content tests and standard leaching tests. If the limit values are exceeded, the waste is not suitable for disposal at that class of landfill site and alternative disposal methods have to be found.

Maximum permissible limit values are determined by the EU (part of what is known as 'full waste acceptance criteria') but individual landfills may have more stringent values to take into account the environmental setting, liner system or additional nature of specific waste streams.

WAC tests should be performed on the soils leaving the site and is not normally part of a site investigation exercise.

6.3 Materials Management

Any material excavated on site may be classified as waste and it is the responsibility of the holder of a material to form their own view on whether or not it is waste. This includes determining when waste that has been treated in some way can cease to be classed as waste for a particular purpose. One of the ways this can be achieved is set out in the Development Industry Code of Practice (CoP) (CL:AIRE, March 2011).

The handling, re-use or disposal of waste is regulated by the Environment Agency. The Agency will take into account the use of the CoP in deciding whether to regulate materials as waste. If materials are dealt with in accordance with the CoP, the Agency considers that those materials are unlikely to be waste at the point when they are to be used for the purpose of land development. The MMP must be signed off by a Qualified Person as defined in the CoP.

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Appendix F

Contamination Test Results and Statistical Analysis

Appendix G

Waste Classification

Appendix H

Hydrock Methodology

Hydrock Report Appendix on Hydrock Methodology, version 27 updated 25-01-16 applies to this report.

This appendix may not be included in the printed report to reduce the document size, but is included in the digital version. Alternatively, it can be supplied on request by quoting the version number and date.

Appendix I

Contamination Test Results and Statistical Analysis

This appendix may not be included in the printed report to reduce the document size, but is included in the digital version.

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Analytical Report Number : 16-27565

Project / Site name:	Rail Central	**Samples received on:**	12/09/2016
Your job number:	C151171	**Samples instructed on:**	12/09/2016
Your order number:	C151171-N9540	**Analysis completed by:**	21/09/2016
Report Issue Number:	1	**Report issued on:**	21/09/2016
Samples Analysed:	94 soil samples		

Signed:

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

Signed:

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

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

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

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

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

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

Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628197	628198	628199	628200	628201
Sample Reference				TPT008	TPT010	TPT011	TPT019	TPT021
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.60-2.40	2.40-3.00	2.80-3.00	1.50-2.00	1.80-2.40
Date Sampled				30/08/2016	31/08/2016	30/08/2016	01/09/2016	30/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	18	20	20	15	19
Total mass of sample received	kg	0.001	NONE	0.48	0.46	0.51	0.51	0.50
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.2	7.8	7.6	8.1	7.8
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	2.0	1.6	1.6	1.6	1.4
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	2030	1620	1580	1610	1420
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.0084	0.0091	0.0096	0.0021	0.0070
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	5.4	14	16	28	51
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.3	1.1	1.1	0.90	2.3
Boron (water soluble)	mg/kg	0.2	MCERTS	5.6	3.5	6.1	4.2	5.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	49	40	40	150	120
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	49	41	40	150	120
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14	12	< 1.0	1.3	12
Lead (aqua regia extractable)	mg/kg	1	MCERTS	13	13	14	36	24
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	31	30	36	24	32
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	32	32	34	190	230
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	68	57	59	37	88

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628197	628198	628199	628200	628201
Sample Reference				TPT008	TPT010	TPT011	TPT019	TPT021
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.60-2.40	2.40-3.00	2.80-3.00	1.50-2.00	1.80-2.40
Date Sampled				30/08/2016	31/08/2016	30/08/2016	01/09/2016	30/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	< 1.0	< 1.0	-	< 1.0
Toluene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	< 1.0
p & m-xylene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	< 1.0
o-xylene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	< 1.0	-	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 1.0	< 1.0	-	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	< 2.0	< 2.0	-	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	< 8.0	< 8.0	-	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	< 8.0	< 8.0	-	< 8.0
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	< 10	< 10	-	< 10
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	< 8.4	< 8.4	-	< 8.4
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	-	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 1.0	< 1.0	-	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	< 2.0	< 2.0	-	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	< 10	< 10	-	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	< 10	< 10	-	< 10
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	< 8.4	< 8.4	-	< 8.4

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628197	628198	628199	628200	628201
Sample Reference				TPT008	TPT010	TPT011	TPT019	TPT021
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.60-2.40	2.40-3.00	2.80-3.00	1.50-2.00	1.80-2.40
Date Sampled				30/08/2016	31/08/2016	30/08/2016	01/09/2016	30/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
N-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
P-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628197	628198	628199	628200	628201
Sample Reference				TPT008	TPT010	TPT011	TPT019	TPT021
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.60-2.40	2.40-3.00	2.80-3.00	1.50-2.00	1.80-2.40
Date Sampled				30/08/2016	31/08/2016	30/08/2016	01/09/2016	30/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.1	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628197	628198	628199	628200	628201
Sample Reference				TPT008	TPT010	TPT011	TPT019	TPT021
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.60-2.40	2.40-3.00	2.80-3.00	1.50-2.00	1.80-2.40
Date Sampled				30/08/2016	31/08/2016	30/08/2016	01/09/2016	30/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628202	628203	628204	628205	628206
Sample Reference				TPA011	TPT005	TPT006	TPT006	TPA008
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.35	0.45-1.10	0.00-0.15	1.10-1.50	0.00-0.35
Date Sampled				23/08/2016	23/08/2016	23/08/2016	23/08/2016	23/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	24	29	6.9	26	17
Total mass of sample received	kg	0.001	NONE	0.48	0.52	0.47	0.49	0.45
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.5	8.3	7.7	8.3	7.3
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.026	0.047	0.087	0.027	0.029
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	26.4	47.2	87.2	26.5	29.0
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.027	0.012	0.040	0.012	0.036
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	17	27	36	24	22
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.9	2.4	2.1	2.2	1.8
Boron (water soluble)	mg/kg	0.2	MCERTS	2.0	1.9	5.1	3.0	1.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	71	95	97	83	70
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	72	95	97	83	70
Copper (aqua regia extractable)	mg/kg	1	MCERTS	10	6.8	4.5	< 1.0	14
Lead (aqua regia extractable)	mg/kg	1	MCERTS	25	23	41	19	47
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	28	39	45	35	32
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	3.3
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	82	110	150	100	92
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	92	120	170	97	100

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628202	628203	628204	628205	628206
Sample Reference				TPA011	TPT005	TPT006	TPT006	TPA008
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.35	0.45-1.10	0.00-0.15	1.10-1.50	0.00-0.35
Date Sampled				23/08/2016	23/08/2016	23/08/2016	23/08/2016	23/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	< 1.0	-	-	-
Toluene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
o-xylene	µg/kg	1	MCERTS	-	< 1.0	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	-	-	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 1.0	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	< 2.0	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	< 8.0	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	< 8.0	-	-	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	< 10	-	-	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	< 8.4	-	-	-

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 1.0	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	< 2.0	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	< 10	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	< 10	-	-	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	< 8.4	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628202	628203	628204	628205	628206
Sample Reference				TPA011	TPT005	TPT006	TPT006	TPA008
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.35	0.45-1.10	0.00-0.15	1.10-1.50	0.00-0.35
Date Sampled				23/08/2016	23/08/2016	23/08/2016	23/08/2016	23/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
N-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
P-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628202	628203	628204	628205	628206
Sample Reference				TPA011	TPT005	TPT006	TPT006	TPA008
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.35	0.45-1.10	0.00-0.15	1.10-1.50	0.00-0.35
Date Sampled				23/08/2016	23/08/2016	23/08/2016	23/08/2016	23/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.1	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	-	-	-	Absent

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628202	628203	628204	628205	628206
Sample Reference				TPA011	TPT005	TPT006	TPT006	TPA008
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.35	0.45-1.10	0.00-0.15	1.10-1.50	0.00-0.35
Date Sampled				23/08/2016	23/08/2016	23/08/2016	23/08/2016	23/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628207	628208	628209	628210	628211
Sample Reference				TPG056	TPG027	TPG020	TPG020	TPG028
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.20	0.20	1.40	0.20
Date Sampled				22/08/2016	02/09/2016	02/09/2016	02/09/2016	02/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	15	18	17	14	15
Total mass of sample received	kg	0.001	NONE	0.51	0.43	0.48	0.52	0.47
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	6.9	6.8	7.4	8.3	7.0
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.016	0.022	0.028	0.034	0.025
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	15.6	21.9	28.1	33.5	25.1
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.020	0.020	0.026	0.0021	0.019
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	44	9.3	20	13	14
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.9	0.99	1.5	1.0	1.0
Boron (water soluble)	mg/kg	0.2	MCERTS	1.5	0.9	2.3	0.8	1.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	110	35	50	34	36
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	120	35	50	34	36
Copper (aqua regia extractable)	mg/kg	1	MCERTS	6.4	13	17	5.0	11
Lead (aqua regia extractable)	mg/kg	1	MCERTS	27	33	87	11	24
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	44	18	22	37	19
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	130	44	72	39	47
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	120	78	330	63	69

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628207	628208	628209	628210	628211
Sample Reference				TPG056	TPG027	TPG020	TPG020	TPG028
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.20	0.20	1.40	0.20
Date Sampled				22/08/2016	02/09/2016	02/09/2016	02/09/2016	02/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	-	-	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628207	628208	628209	628210	628211
Sample Reference				TPG056	TPG027	TPG020	TPG020	TPG028
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.20	0.20	1.40	0.20
Date Sampled				22/08/2016	02/09/2016	02/09/2016	02/09/2016	02/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
N-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
P-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628207	628208	628209	628210	628211
Sample Reference				TPG056	TPG027	TPG020	TPG020	TPG028
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.20	0.20	1.40	0.20
Date Sampled				22/08/2016	02/09/2016	02/09/2016	02/09/2016	02/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.1	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	Absent	-	-	-	-

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

Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628207	628208	628209	628210	628211
Sample Reference				TPG056	TPG027	TPG020	TPG020	TPG028
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.20	0.20	1.40	0.20
Date Sampled				22/08/2016	02/09/2016	02/09/2016	02/09/2016	02/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628212	628213	628214	628215	628216
Sample Reference				TPG014	TPR011	TPT026	TPT026	TPT019
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.20	1.00	0.20
Date Sampled				02/09/2016	01/09/2016	01/09/2016	01/09/2016	31/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	21	16	13	19	22
Total mass of sample received	kg	0.001	NONE	0.50	0.47	0.48	0.49	0.52
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.9	7.9	7.7	7.5	8.4
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.039	0.094	0.092	1.3	0.044
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	39.2	94.2	92.4	1320	44.3
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.037	0.023	0.0078	0.0027	0.031
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	18	13	18	21	22
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.1	1.1	1.2	1.4	1.3
Boron (water soluble)	mg/kg	0.2	MCERTS	2.9	2.4	1.1	2.9	1.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	45	44	50	52	55
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	46	45	50	52	55
Copper (aqua regia extractable)	mg/kg	1	MCERTS	22	12	< 1.0	13	18
Lead (aqua regia extractable)	mg/kg	1	MCERTS	36	22	16	16	25
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.4	0.7	< 0.3	0.4	0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	22	20	20	41	21
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	50	43	71	38	86
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	120	59	62	69	64

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628212	628213	628214	628215	628216
Sample Reference				TPG014	TPR011	TPT026	TPT026	TPT019
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.20	1.00	0.20
Date Sampled				02/09/2016	01/09/2016	01/09/2016	01/09/2016	31/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	-	-	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628212	628213	628214	628215	628216
Sample Reference				TPG014	TPR011	TPT026	TPT026	TPT019
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.20	1.00	0.20
Date Sampled				02/09/2016	01/09/2016	01/09/2016	01/09/2016	31/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
N-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
P-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628212	628213	628214	628215	628216
Sample Reference				TPG014	TPR011	TPT026	TPT026	TPT019
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.20	1.00	0.20
Date Sampled				02/09/2016	01/09/2016	01/09/2016	01/09/2016	31/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.1	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	-	-	-	-

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

Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628212	628213	628214	628215	628216
Sample Reference				TPG014	TPR011	TPT026	TPT026	TPT019
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.20	1.00	0.20
Date Sampled				02/09/2016	01/09/2016	01/09/2016	01/09/2016	31/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628217	628218	628219	628220	628221
Sample Reference				TPT019	TPT023	TPR008	TPR008	TPT025
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	0.20	0.20	1.00	0.20
Date Sampled				31/08/2016	01/09/2016	31/08/2016	31/08/2016	01/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	14	17	15	14	20
Total mass of sample received	kg	0.001	NONE	0.47	0.49	0.49	0.51	0.49
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.5	9.3	7.8	7.3	7.3
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.15	0.27	0.010	0.070	0.063
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	153	272	10.3	69.7	62.5
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.0050	0.030	0.023	0.0026	0.028
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	28	31	28	22	21
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.4	1.4	1.8	1.9	1.4
Boron (water soluble)	mg/kg	0.2	MCERTS	2.8	2.5	1.9	0.4	2.0
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	150	65	57	54	58
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	150	65	58	54	58
Copper (aqua regia extractable)	mg/kg	1	MCERTS	12	14	52	< 1.0	12
Lead (aqua regia extractable)	mg/kg	1	MCERTS	46	22	52	16	29
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.6	< 0.3	0.7	< 0.3	0.7
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	17	29	25	42	26
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	270	100	92	95	78
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	26	85	130	96	88

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628217	628218	628219	628220	628221
Sample Reference				TPT019	TPT023	TPR008	TPR008	TPT025
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	0.20	0.20	1.00	0.20
Date Sampled				31/08/2016	01/09/2016	31/08/2016	31/08/2016	01/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	-	-	-	-
Toluene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
o-xylene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	-	-	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	< 10	-	-	-	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	-	-	-	-

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	-	-	-	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628217	628218	628219	628220	628221
Sample Reference				TPT019	TPT023	TPR008	TPR008	TPT025
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	0.20	0.20	1.00	0.20
Date Sampled				31/08/2016	01/09/2016	31/08/2016	31/08/2016	01/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
N-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
P-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628217	628218	628219	628220	628221
Sample Reference				TPT019	TPT023	TPR008	TPR008	TPT025
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	0.20	0.20	1.00	0.20
Date Sampled				31/08/2016	01/09/2016	31/08/2016	31/08/2016	01/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.1	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	Absent	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628217	628218	628219	628220	628221
Sample Reference				TPT019	TPT023	TPR008	TPR008	TPT025
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	0.20	0.20	1.00	0.20
Date Sampled				31/08/2016	01/09/2016	31/08/2016	31/08/2016	01/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628222	628223	628224	628225	628226
Sample Reference				TPT025	TPR009	TPR009	TPH011	TPG011
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00	0.20	1.00	0.20	1.00
Date Sampled				01/09/2016	01/09/2016	01/09/2016	01/09/2016	01/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	18	22	18	15	18
Total mass of sample received	kg	0.001	NONE	0.49	0.49	0.52	0.47	0.50
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	6.5	7.3	7.8	7.8	7.6
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.42	0.029	0.11	0.044	0.37
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	424	28.5	111	43.7	367
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.0054	0.030	0.0047	0.020	0.0035
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	15	17	12	18	17
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.5	1.3	1.6	1.1	1.6
Boron (water soluble)	mg/kg	0.2	MCERTS	1.7	3.1	2.2	1.5	2.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	57	47	57	41	55
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	57	47	57	41	55
Copper (aqua regia extractable)	mg/kg	1	MCERTS	12	45	15	10	12
Lead (aqua regia extractable)	mg/kg	1	MCERTS	18	28	15	20	18
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	46	19	45	20	59
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	40	75	37	51	41
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	72	88	76	62	85

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628222	628223	628224	628225	628226
Sample Reference				TPT025	TPR009	TPR009	TPH011	TPG011
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00	0.20	1.00	0.20	1.00
Date Sampled				01/09/2016	01/09/2016	01/09/2016	01/09/2016	01/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	-	-	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628222	628223	628224	628225	628226
Sample Reference				TPT025	TPR009	TPR009	TPH011	TPG011
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00	0.20	1.00	0.20	1.00
Date Sampled				01/09/2016	01/09/2016	01/09/2016	01/09/2016	01/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
N-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
P-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628222	628223	628224	628225	628226
Sample Reference				TPT025	TPR009	TPR009	TPH011	TPG011
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00	0.20	1.00	0.20	1.00
Date Sampled				01/09/2016	01/09/2016	01/09/2016	01/09/2016	01/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.1	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628222	628223	628224	628225	628226
Sample Reference				TPT025	TPR009	TPR009	TPH011	TPG011
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00	0.20	1.00	0.20	1.00
Date Sampled				01/09/2016	01/09/2016	01/09/2016	01/09/2016	01/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628227	628228	628229	628230	628231
Sample Reference				TPR010	TPR010	TPG024	TPR015	TPG025
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	1.00	0.20	0.20	0.20
Date Sampled				01/09/2016	01/09/2016	30/08/2016	30/08/2016	30/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	17	19	18	16	13
Total mass of sample received	kg	0.001	NONE	0.47	0.51	0.51	0.48	0.48
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.5	7.8	7.2	7.9	7.8
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.12	0.13	1.0	0.41	0.060
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	116	129	1050	409	60.0
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.0073	0.0051	0.027	0.0058	0.010
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	11	15	12	12	20
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.2	1.5	1.2	1.5	1.4
Boron (water soluble)	mg/kg	0.2	MCERTS	0.9	2.8	1.5	1.9	0.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	41	49	49	54	43
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	42	50	49	54	44
Copper (aqua regia extractable)	mg/kg	1	MCERTS	5.4	18	10	12	9.6
Lead (aqua regia extractable)	mg/kg	1	MCERTS	14	17	21	14	17
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	0.7	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	54	19	24	28
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	52	37	64	42	54
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	51	72	71	55	67

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628227	628228	628229	628230	628231
Sample Reference				TPR010	TPR010	TPG024	TPR015	TPG025
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	1.00	0.20	0.20	0.20
Date Sampled				01/09/2016	01/09/2016	30/08/2016	30/08/2016	30/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	-	-	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628227	628228	628229	628230	628231
Sample Reference				TPR010	TPR010	TPG024	TPR015	TPG025
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	1.00	0.20	0.20	0.20
Date Sampled				01/09/2016	01/09/2016	30/08/2016	30/08/2016	30/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
N-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
P-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628227	628228	628229	628230	628231
Sample Reference				TPR010	TPR010	TPG024	TPR015	TPG025
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	1.00	0.20	0.20	0.20
Date Sampled				01/09/2016	01/09/2016	30/08/2016	30/08/2016	30/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.1	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	Absent	-	-	-	Absent

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628227	628228	628229	628230	628231
Sample Reference				TPR010	TPR010	TPG024	TPR015	TPG025
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	1.00	0.20	0.20	0.20
Date Sampled				01/09/2016	01/09/2016	30/08/2016	30/08/2016	30/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628232	628233	628234	628235	628236
Sample Reference				TPR004	TPT021	TPT011	TPT008	TPT009
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.20	0.20	0.20
Date Sampled				30/08/2016	30/08/2016	30/08/2016	30/08/2016	31/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	14	16	18	15	14
Total mass of sample received	kg	0.001	NONE	0.51	0.49	0.48	0.48	0.50
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.5	8.2	7.8	7.9	8.1
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.099	0.14	0.22	0.027	0.46
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	99.1	144	224	27.1	463
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.020	0.010	0.024	0.028	0.020
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.8	15	41	14	16
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.1	1.2	1.6	0.88	0.93
Boron (water soluble)	mg/kg	0.2	MCERTS	1.2	1.3	1.6	2.5	1.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	40	42	62	33	41
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	40	42	63	34	41
Copper (aqua regia extractable)	mg/kg	1	MCERTS	25	22	6.2	14	12
Lead (aqua regia extractable)	mg/kg	1	MCERTS	23	15	24	21	15
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.9	< 0.3	0.5	< 0.3	0.7
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	26	30	29	17	21
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	60	53	84	45	40
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	72	60	86	59	54

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628232	628233	628234	628235	628236
Sample Reference				TPR004	TPT021	TPT011	TPT008	TPT009
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.20	0.20	0.20
Date Sampled				30/08/2016	30/08/2016	30/08/2016	30/08/2016	31/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	-	-	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628232	628233	628234	628235	628236
Sample Reference				TPR004	TPT021	TPT011	TPT008	TPT009
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.20	0.20	0.20
Date Sampled				30/08/2016	30/08/2016	30/08/2016	30/08/2016	31/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
N-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
P-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628232	628233	628234	628235	628236
Sample Reference				TPR004	TPT021	TPT011	TPT008	TPT009
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.20	0.20	0.20
Date Sampled				30/08/2016	30/08/2016	30/08/2016	30/08/2016	31/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.1	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628232	628233	628234	628235	628236
Sample Reference				TPR004	TPT021	TPT011	TPT008	TPT009
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.20	0.20	0.20
Date Sampled				30/08/2016	30/08/2016	30/08/2016	30/08/2016	31/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628237	628238	628239	628240	628241
Sample Reference				TPT007	TPT010	TPT024	TPT024	TPT022
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.20	1.50	0.20
Date Sampled				31/08/2016	31/08/2016	31/08/2016	31/08/2016	31/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	24	36	19	19	15
Total mass of sample received	kg	0.001	NONE	0.46	0.52	0.40	0.51	0.50
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.3	8.0	8.3	8.1	8.2
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.044	0.31	0.088	0.60	0.041
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	43.7	313	87.7	598	40.8
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.024	0.027	0.020	0.0071	0.032
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	19	14	13	12	30
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.2	0.94	1.1	1.5	1.5
Boron (water soluble)	mg/kg	0.2	MCERTS	1.8	2.7	0.6	3.0	2.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	43	33	35	78	84
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	43	34	36	78	84
Copper (aqua regia extractable)	mg/kg	1	MCERTS	16	15	28	14	11
Lead (aqua regia extractable)	mg/kg	1	MCERTS	22	18	17	18	27
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.4	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	20	21	23	32	24
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	2.1	< 1.0	< 1.0	< 1.0	1.9
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	60	36	40	110	160
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	68	60	57	67	79

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628237	628238	628239	628240	628241
Sample Reference				TPT007	TPT010	TPT024	TPT024	TPT022
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.20	1.50	0.20
Date Sampled				31/08/2016	31/08/2016	31/08/2016	31/08/2016	31/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	-	-	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628237	628238	628239	628240	628241
Sample Reference				TPT007	TPT010	TPT024	TPT024	TPT022
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.20	1.50	0.20
Date Sampled				31/08/2016	31/08/2016	31/08/2016	31/08/2016	31/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
N-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
P-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628237	628238	628239	628240	628241
Sample Reference				TPT007	TPT010	TPT024	TPT024	TPT022
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.20	1.50	0.20
Date Sampled				31/08/2016	31/08/2016	31/08/2016	31/08/2016	31/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.1	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628237	628238	628239	628240	628241
Sample Reference				TPT007	TPT010	TPT024	TPT024	TPT022
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.20	1.50	0.20
Date Sampled				31/08/2016	31/08/2016	31/08/2016	31/08/2016	31/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628242	628243	628244	628245	628246
Sample Reference				TPT022	TPA004	TPRT003	TPRT004	TPRT002
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.50	0.30-0.60	0.20	0.15	0.20
Date Sampled				31/08/2016	05/09/2016	24/08/2016	24/08/2016	24/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	16	9.9	11	17	16
Total mass of sample received	kg	0.001	NONE	0.50	0.53	1.1	1.2	1.3
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.2	7.8	7.6	7.3	8.0
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.37	0.021	0.037	0.017	0.026
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	373	20.9	37.0	17.1	25.8
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.0084	0.0044	0.020	0.024	0.0061
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	0.56	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	0.58	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	0.28	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.32	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	0.38	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	0.20	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	0.32	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	2.64	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	35	32	13	13	9.8
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.3	1.5	1.3	1.3	1.5
Boron (water soluble)	mg/kg	0.2	MCERTS	2.9	0.9	2.4	2.0	1.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	47	43	45	49	53
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	48	43	46	49	53
Copper (aqua regia extractable)	mg/kg	1	MCERTS	12	15	13	12	5.4
Lead (aqua regia extractable)	mg/kg	1	MCERTS	12	18	23	30	14
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	28	33	23	23	25
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	54	81	58	61	48
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	60	110	73	81	56

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628242	628243	628244	628245	628246
Sample Reference				TPT022	TPA004	TPRT003	TPRT004	TPRT002
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.50	0.30-0.60	0.20	0.15	0.20
Date Sampled				31/08/2016	05/09/2016	24/08/2016	24/08/2016	24/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	-	-	-	-
Toluene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
o-xylene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	-	-	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	< 10	-	-	-	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	-	-	-	-

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	-	-	-	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628242	628243	628244	628245	628246
Sample Reference				TPT022	TPA004	TPRT003	TPRT004	TPRT002
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.50	0.30-0.60	0.20	0.15	0.20
Date Sampled				31/08/2016	05/09/2016	24/08/2016	24/08/2016	24/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
N-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
P-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628242	628243	628244	628245	628246
Sample Reference				TPT022	TPA004	TPRT003	TPRT004	TPRT002
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.50	0.30-0.60	0.20	0.15	0.20
Date Sampled				31/08/2016	05/09/2016	24/08/2016	24/08/2016	24/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.1	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628242	628243	628244	628245	628246
Sample Reference				TPT022	TPA004	TPRT003	TPRT004	TPRT002
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.50	0.30-0.60	0.20	0.15	0.20
Date Sampled				31/08/2016	05/09/2016	24/08/2016	24/08/2016	24/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628247	628248	628249	628250	628251
Sample Reference				TPRT001	TPL002	TPL001	TPG057	TPG058
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.25	0.20	0.15	0.25	0.15
Date Sampled				24/08/2016	24/08/2016	24/08/2016	25/08/2016	25/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	16	13	16	15	12
Total mass of sample received	kg	0.001	NONE	1.3	0.42	0.91	0.54	0.48
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.5	7.8	8.0	8.3	7.0
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.017	0.016	0.028	0.11	0.013
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	16.7	16.1	27.9	105	12.5
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.021	0.019	0.0078	0.018	0.018
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	21	21	16	16	15
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.3	1.3	1.2	1.2	0.89
Boron (water soluble)	mg/kg	0.2	MCERTS	2.1	2.1	1.0	1.1	0.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	45	42	41	42	31
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	46	42	42	42	32
Copper (aqua regia extractable)	mg/kg	1	MCERTS	8.8	20	8.9	18	10
Lead (aqua regia extractable)	mg/kg	1	MCERTS	25	58	23	46	28
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	0.4	0.5
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	22	26	24	24	17
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	57	66	54	49	48
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	64	94	71	160	54

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628247	628248	628249	628250	628251
Sample Reference				TPRT001	TPL002	TPL001	TPG057	TPG058
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.25	0.20	0.15	0.25	0.15
Date Sampled				24/08/2016	24/08/2016	24/08/2016	25/08/2016	25/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	-	-	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628247	628248	628249	628250	628251
Sample Reference				TPRT001	TPL002	TPL001	TPG057	TPG058
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.25	0.20	0.15	0.25	0.15
Date Sampled				24/08/2016	24/08/2016	24/08/2016	25/08/2016	25/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
N-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
P-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628247	628248	628249	628250	628251
Sample Reference				TPRT001	TPL002	TPL001	TPG057	TPG058
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.25	0.20	0.15	0.25	0.15
Date Sampled				24/08/2016	24/08/2016	24/08/2016	25/08/2016	25/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.1	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	Absent	-	-	-	Absent

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628247	628248	628249	628250	628251
Sample Reference				TPRT001	TPL002	TPL001	TPG057	TPG058
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.25	0.20	0.15	0.25	0.15
Date Sampled				24/08/2016	24/08/2016	24/08/2016	25/08/2016	25/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628252	628253	628254	628255	628256
Sample Reference				TPG062	TPG059	TPG063	TPT001	TPT002
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.15	0.20	0.30
Date Sampled				25/08/2016	25/08/2016	25/08/2016	25/08/2016	25/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	13	13	14	13	16
Total mass of sample received	kg	0.001	NONE	0.47	0.55	0.43	0.51	0.50
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.0	7.6	7.7	8.3	8.0
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.016	0.012	0.016	0.024	0.041
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	16.1	11.7	15.5	23.8	41.3
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.012	0.014	0.022	0.025	0.022
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	18	8.3	13	28	22
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.1	0.98	1.1	2.0	1.3
Boron (water soluble)	mg/kg	0.2	MCERTS	1.8	2.8	1.8	2.3	2.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	33	36	40	49	49
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	33	37	40	49	49
Copper (aqua regia extractable)	mg/kg	1	MCERTS	2.8	6.2	8.7	19	11
Lead (aqua regia extractable)	mg/kg	1	MCERTS	26	17	22	120	27
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	0.4	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	20	18	19	31	25
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	56	46	53	80	68
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	65	54	59	110	79

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628252	628253	628254	628255	628256
Sample Reference				TPG062	TPG059	TPG063	TPT001	TPT002
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.15	0.20	0.30
Date Sampled				25/08/2016	25/08/2016	25/08/2016	25/08/2016	25/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	-	-	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628252	628253	628254	628255	628256
Sample Reference				TPG062	TPG059	TPG063	TPT001	TPT002
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.15	0.20	0.30
Date Sampled				25/08/2016	25/08/2016	25/08/2016	25/08/2016	25/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
N-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
P-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628252	628253	628254	628255	628256
Sample Reference				TPG062	TPG059	TPG063	TPT001	TPT002
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.15	0.20	0.30
Date Sampled				25/08/2016	25/08/2016	25/08/2016	25/08/2016	25/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.1	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	Absent	-	-	-	-

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

Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628252	628253	628254	628255	628256
Sample Reference				TPG062	TPG059	TPG063	TPT001	TPT002
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.15	0.20	0.30
Date Sampled				25/08/2016	25/08/2016	25/08/2016	25/08/2016	25/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628257	628258	628259	628260	628261
Sample Reference				TPL004	TPR003	TPR002	TPG033	TPR013
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.25	0.20	0.15	0.15	0.10
Date Sampled				25/08/2016	26/08/2016	26/08/2016	26/08/2016	26/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	9.0	11	12	9.0	17
Total mass of sample received	kg	0.001	NONE	1.1	1.3	1.5	1.2	1.2
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.7	7.4	8.2	7.5	7.0
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.012	0.14	0.044	0.028	0.028
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	11.5	136	43.9	28.1	28.0
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.0098	0.017	0.014	0.016	0.033
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	10	19	14	19	13
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.80	1.1	1.4	0.86	1.5
Boron (water soluble)	mg/kg	0.2	MCERTS	1.8	1.9	3.3	1.1	2.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	28	35	42	32	52
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	28	35	42	32	52
Copper (aqua regia extractable)	mg/kg	1	MCERTS	7.4	17	16	3.0	16
Lead (aqua regia extractable)	mg/kg	1	MCERTS	22	58	22	20	24
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	14	27	30	21	33
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	42	52	63	56	55
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	54	67	73	67	76

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628257	628258	628259	628260	628261
Sample Reference				TPL004	TPR003	TPR002	TPG033	TPR013
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.25	0.20	0.15	0.15	0.10
Date Sampled				25/08/2016	26/08/2016	26/08/2016	26/08/2016	26/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	-	-	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628257	628258	628259	628260	628261
Sample Reference				TPL004	TPR003	TPR002	TPG033	TPR013
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.25	0.20	0.15	0.15	0.10
Date Sampled				25/08/2016	26/08/2016	26/08/2016	26/08/2016	26/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
N-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
P-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628257	628258	628259	628260	628261
Sample Reference				TPL004	TPR003	TPR002	TPG033	TPR013
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.25	0.20	0.15	0.15	0.10
Date Sampled				25/08/2016	26/08/2016	26/08/2016	26/08/2016	26/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.1	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	-	-	-	-

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

Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628257	628258	628259	628260	628261
Sample Reference				TPL004	TPR003	TPR002	TPG033	TPR013
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.25	0.20	0.15	0.15	0.10
Date Sampled				25/08/2016	26/08/2016	26/08/2016	26/08/2016	26/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628262	628263	628264	628265	628266
Sample Reference				TPG026	TPR014	TPG013	TPA005	TPA006
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.15	0.30	0.20	0.15
Date Sampled				26/08/2016	26/08/2016	26/08/2016	05/09/2016	05/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	14	13	13	19	19
Total mass of sample received	kg	0.001	NONE	1.4	1.4	1.3	1.3	1.1
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.7	7.9	7.5	7.6	7.4
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.028	0.012	0.0097	0.020	0.023
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	27.5	11.9	9.7	19.5	22.6
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.023	0.027	0.028	0.027	0.035
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	20	9.5	7.1	27	29
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.0	1.0	0.90	1.7	1.6
Boron (water soluble)	mg/kg	0.2	MCERTS	2.3	0.7	1.9	3.3	1.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	37	39	37	64	61
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	37	39	37	65	61
Copper (aqua regia extractable)	mg/kg	1	MCERTS	13	11	11	10	11
Lead (aqua regia extractable)	mg/kg	1	MCERTS	24	20	21	28	31
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	22	17	15	29	31
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	53	50	49	96	95
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	60	59	56	90	98

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628262	628263	628264	628265	628266
Sample Reference				TPG026	TPR014	TPG013	TPA005	TPA006
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.15	0.30	0.20	0.15
Date Sampled				26/08/2016	26/08/2016	26/08/2016	05/09/2016	05/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	-	-	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628262	628263	628264	628265	628266
Sample Reference				TPG026	TPR014	TPG013	TPA005	TPA006
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.15	0.30	0.20	0.15
Date Sampled				26/08/2016	26/08/2016	26/08/2016	05/09/2016	05/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
N-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
P-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628262	628263	628264	628265	628266
Sample Reference				TPG026	TPR014	TPG013	TPA005	TPA006
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.15	0.30	0.20	0.15
Date Sampled				26/08/2016	26/08/2016	26/08/2016	05/09/2016	05/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.1	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	-	-	-	Absent

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628262	628263	628264	628265	628266
Sample Reference				TPG026	TPR014	TPG013	TPA005	TPA006
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.15	0.30	0.20	0.15
Date Sampled				26/08/2016	26/08/2016	26/08/2016	05/09/2016	05/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628267	628268	628269	628270	628271
Sample Reference				TPG052	TPA001	TPA002	TPA003	TPL003
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.10	0.25	0.30	0.30
Date Sampled				05/09/2016	06/09/2016	06/09/2016	06/09/2016	06/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	22	18	16	13	13
Total mass of sample received	kg	0.001	NONE	1.1	1.2	1.3	1.4	1.4
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.2	6.0	7.4	6.7	8.1
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.028	0.038	0.012	0.015	0.031
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	28.1	38.0	11.8	14.9	30.8
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.031	0.028	0.024	0.015	0.019
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	28	22	15	21	20
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.7	1.4	1.1	1.1	1.3
Boron (water soluble)	mg/kg	0.2	MCERTS	2.7	2.2	2.1	1.0	2.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	65	54	41	39	42
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	66	55	41	40	42
Copper (aqua regia extractable)	mg/kg	1	MCERTS	12	12	10	6.2	18
Lead (aqua regia extractable)	mg/kg	1	MCERTS	33	34	27	24	53
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	29	25	18	18	27
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	1.5	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	98	85	67	69	60
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	99	95	70	65	85

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628267	628268	628269	628270	628271
Sample Reference				TPG052	TPA001	TPA002	TPA003	TPL003
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.10	0.25	0.30	0.30
Date Sampled				05/09/2016	06/09/2016	06/09/2016	06/09/2016	06/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	-	-	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628267	628268	628269	628270	628271
Sample Reference				TPG052	TPA001	TPA002	TPA003	TPL003
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.10	0.25	0.30	0.30
Date Sampled				05/09/2016	06/09/2016	06/09/2016	06/09/2016	06/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
N-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
P-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628267	628268	628269	628270	628271
Sample Reference				TPG052	TPA001	TPA002	TPA003	TPL003
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.10	0.25	0.30	0.30
Date Sampled				05/09/2016	06/09/2016	06/09/2016	06/09/2016	06/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.1	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628267	628268	628269	628270	628271
Sample Reference				TPG052	TPA001	TPA002	TPA003	TPL003
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.10	0.25	0.30	0.30
Date Sampled				05/09/2016	06/09/2016	06/09/2016	06/09/2016	06/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628272	628273	628274	628275	628276
Sample Reference				TPL005	TPL007	TPL008	TPL009	TPL006
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.15	0.50	0.70	0.25	0.25
Date Sampled				06/09/2016	06/09/2016	06/09/2016	06/09/2016	07/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	12	9.5	9.6	12	10
Total mass of sample received	kg	0.001	NONE	1.2	1.3	1.2	1.2	1.2
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.3	8.7	8.2	8.0	7.7
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.015	0.052	1.2	0.014	0.0091
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	14.5	52.4	1180	13.9	9.1
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.015	0.0070	0.0076	0.016	0.017
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	22	41	19	43	30
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.1	1.2	1.5	1.4	1.3
Boron (water soluble)	mg/kg	0.2	MCERTS	1.3	1.5	2.4	2.5	2.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	36	37	44	44	44
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	37	37	44	44	44
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14	8.5	5.4	4.8	10
Lead (aqua regia extractable)	mg/kg	1	MCERTS	32	48	22	31	37
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	0.7	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	23	29	29	29	28
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	56	73	60	78	66
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	69	92	81	85	88

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628272	628273	628274	628275	628276
Sample Reference				TPL005	TPL007	TPL008	TPL009	TPL006
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.15	0.50	0.70	0.25	0.25
Date Sampled				06/09/2016	06/09/2016	06/09/2016	06/09/2016	07/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	-	-	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628272	628273	628274	628275	628276
Sample Reference				TPL005	TPL007	TPL008	TPL009	TPL006
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.15	0.50	0.70	0.25	0.25
Date Sampled				06/09/2016	06/09/2016	06/09/2016	06/09/2016	07/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
N-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
P-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628272	628273	628274	628275	628276
Sample Reference				TPL005	TPL007	TPL008	TPL009	TPL006
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.15	0.50	0.70	0.25	0.25
Date Sampled				06/09/2016	06/09/2016	06/09/2016	06/09/2016	07/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.1	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628272	628273	628274	628275	628276
Sample Reference				TPL005	TPL007	TPL008	TPL009	TPL006
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.15	0.50	0.70	0.25	0.25
Date Sampled				06/09/2016	06/09/2016	06/09/2016	06/09/2016	07/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628277	628278	628279	628280	628281
Sample Reference				TPA024	TPA025	TPA028	TPL011	TPL010
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.10	0.20	0.80	0.15
Date Sampled				07/09/2016	07/09/2016	07/09/2016	07/09/2016	07/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	12	18	13	8.2	9.2
Total mass of sample received	kg	0.001	NONE	1.1	1.4	1.2	1.1	1.2
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.5	7.8	7.6	8.4	7.5
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0092	0.022	0.013	0.14	0.46
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	9.2	22.2	12.7	139	456
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.013	0.025	0.019	0.0072	0.017
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	26	32	19	120	11
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.2	2.1	1.3	5.0	0.62
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	3.0	1.7	1.8	1.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	47	65	38	270	27
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	48	66	39	270	28
Copper (aqua regia extractable)	mg/kg	1	MCERTS	13	32	35	16	43
Lead (aqua regia extractable)	mg/kg	1	MCERTS	44	80	62	28	36
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.6	0.8	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	25	34	23	76	18
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	3.8	3.3	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	65	88	57	430	36
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	73	120	75	220	85

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628277	628278	628279	628280	628281
Sample Reference				TPA024	TPA025	TPA028	TPL011	TPL010
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.10	0.20	0.80	0.15
Date Sampled				07/09/2016	07/09/2016	07/09/2016	07/09/2016	07/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	< 8.0	43
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	-	< 10	43
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	< 8.4	14

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	< 10	< 10
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	< 8.4	< 8.4

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628277	628278	628279	628280	628281
Sample Reference				TPA024	TPA025	TPA028	TPL011	TPL010
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.10	0.20	0.80	0.15
Date Sampled				07/09/2016	07/09/2016	07/09/2016	07/09/2016	07/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
Chloroethane	µg/kg	1	NONE	-	-	-	< 1.0	< 1.0
Bromomethane	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
Vinyl Chloride	µg/kg	1	NONE	-	-	-	< 1.0	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	< 1.0	< 1.0
1,1-dichloroethene	µg/kg	1	NONE	-	-	-	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,1-dichloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Trichloromethane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,2-dichloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	< 1.0	< 1.0
Benzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,2-dichloropropane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Trichloroethene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Dibromomethane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
Tetrachloroethene	µg/kg	1	NONE	-	-	-	< 1.0	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Styrene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Tribromomethane	µg/kg	1	NONE	-	-	-	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Bromobenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
N-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
Tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
Sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,3-dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
P-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
1,2-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,4-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Butylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628277	628278	628279	628280	628281
Sample Reference				TPA024	TPA025	TPA028	TPL011	TPL010
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.10	0.20	0.80	0.15
Date Sampled				07/09/2016	07/09/2016	07/09/2016	07/09/2016	07/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	-	-	-	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	< 0.10	< 0.10
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
Fluorene	mg/kg	0.1	MCERTS	-	-	-	< 0.10	< 0.10
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	-	-	-	< 0.10	< 0.10
Carbazole	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	-	-	-	< 0.10	< 0.10
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	< 0.05
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	Absent	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628277	628278	628279	628280	628281
Sample Reference				TPA024	TPA025	TPA028	TPL011	TPL010
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.10	0.20	0.80	0.15
Date Sampled				07/09/2016	07/09/2016	07/09/2016	07/09/2016	07/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628282	628283	628284	628285	628286
Sample Reference				TPL010	TPA044	TPG017	TPA041	TPA040
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.70	0.15	0.10	0.10	0.15
Date Sampled				07/09/2016	08/09/2016	08/09/2016	08/09/2016	08/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	15	19	15	14	18
Total mass of sample received	kg	0.001	NONE	1.3	1.3	1.3	1.2	1.2
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.2	7.8	7.1	7.5	7.5
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.94	0.037	0.020	0.037	0.084
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	944	36.9	20.4	37.3	83.8
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.0090	0.026	0.023	0.022	0.028
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	0.48	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	0.56	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	2.6	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	0.43	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	3.4	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	2.8	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	1.3	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	0.96	< 0.05	< 0.05	0.08	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	1.1	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	0.35	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	0.86	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	0.34	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.47	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	15.6	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	32	16	16	8.6	11
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.4	1.3	1.1	1.0	1.4
Boron (water soluble)	mg/kg	0.2	MCERTS	1.7	3.0	1.4	2.3	2.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	57	50	39	38	52
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	57	51	39	39	53
Copper (aqua regia extractable)	mg/kg	1	MCERTS	4.8	9.9	14	14	16
Lead (aqua regia extractable)	mg/kg	1	MCERTS	27	27	26	33	45
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.4	0.6	0.7	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	37	20	20	17	20
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	78	61	48	45	54
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	93	73	70	75	81

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628282	628283	628284	628285	628286
Sample Reference				TPL010	TPA044	TPG017	TPA041	TPA040
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.70	0.15	0.10	0.10	0.15
Date Sampled				07/09/2016	08/09/2016	08/09/2016	08/09/2016	08/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	-	-	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628282	628283	628284	628285	628286
Sample Reference				TPL010	TPA044	TPG017	TPA041	TPA040
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.70	0.15	0.10	0.10	0.15
Date Sampled				07/09/2016	08/09/2016	08/09/2016	08/09/2016	08/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
N-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
P-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628282	628283	628284	628285	628286
Sample Reference				TPL010	TPA044	TPG017	TPA041	TPA040
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.70	0.15	0.10	0.10	0.15
Date Sampled				07/09/2016	08/09/2016	08/09/2016	08/09/2016	08/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.1	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	-	-	-	-

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628282	628283	628284	628285	628286
Sample Reference				TPL010	TPA044	TPG017	TPA041	TPA040
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.70	0.15	0.10	0.10	0.15
Date Sampled				07/09/2016	08/09/2016	08/09/2016	08/09/2016	08/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628287	628288	628289	628391	
Sample Reference				TPA036	TPA037	TPG021	TPT005	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.10	0.20	0.20	0.00-0.45	
Date Sampled				08/09/2016	08/09/2016	08/09/2016	23/08/2016	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	14	14	14	17	
Total mass of sample received	kg	0.001	NONE	1.2	1.3	1.3	1.1	
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.9	7.4	6.9	8.1	
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.020	0.019	0.053	0.025	
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	19.8	18.8	53.4	25.3	
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.029	0.018	0.023	0.026	
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	20	12	16	34	
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.2	1.0	0.90	2.0	
Boron (water soluble)	mg/kg	0.2	MCERTS	2.5	2.5	1.9	3.8	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	
Chromium (III)	mg/kg	1	NONE	44	38	32	87	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	45	39	32	88	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	16	12	7.5	4.3	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	25	31	19	37	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.3	< 0.3	0.7	< 0.3	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	19	19	15	40	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	50	44	42	140	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	69	120	53	130	

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628287	628288	628289	628391	
Sample Reference				TPA036	TPA037	TPG021	TPT005	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.10	0.20	0.20	0.00-0.45	
Date Sampled				08/09/2016	08/09/2016	08/09/2016	23/08/2016	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	-	
Toluene	µg/kg	1	MCERTS	-	-	-	-	
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	
o-xylene	µg/kg	1	MCERTS	-	-	-	-	
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	-	
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	-	-	
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	-	
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628287	628288	628289	628391	
Sample Reference				TPA036	TPA037	TPG021	TPT005	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.10	0.20	0.20	0.00-0.45	
Date Sampled				08/09/2016	08/09/2016	08/09/2016	23/08/2016	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	
Chloroethane	µg/kg	1	NONE	-	-	-	-	
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	
1,1-dichloroethene	µg/kg	1	NONE	-	-	-	-	
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	
1,1-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	
1,2-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	
Benzene	µg/kg	1	MCERTS	-	-	-	-	
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	
1,2-dichloropropane	µg/kg	1	MCERTS	-	-	-	-	
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	
Toluene	µg/kg	1	MCERTS	-	-	-	-	
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	
Styrene	µg/kg	1	MCERTS	-	-	-	-	
Tribromomethane	µg/kg	1	NONE	-	-	-	-	
o-xylene	µg/kg	1	MCERTS	-	-	-	-	
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	
N-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	
Tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	
Sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	
1,3-dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	
P-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	
1,2-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	
1,4-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628287	628288	628289	628391	
Sample Reference				TPA036	TPA037	TPG021	TPT005	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.10	0.20	0.20	0.00-0.45	
Date Sampled				08/09/2016	08/09/2016	08/09/2016	23/08/2016	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	-	
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	
Fluorene	mg/kg	0.1	MCERTS	-	-	-	-	
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	-	
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	
Pyrene	mg/kg	0.1	MCERTS	-	-	-	-	
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	-	Absent	-	

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Analytical Report Number: 16-27565

Project / Site name: Rail Central
Your Order No: C151171-N9540

Lab Sample Number				628287	628288	628289	628391	
Sample Reference				TPA036	TPA037	TPG021	TPT005	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.10	0.20	0.20	0.00-0.45	
Date Sampled				08/09/2016	08/09/2016	08/09/2016	23/08/2016	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					

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Analytical Report Number : 16-27565

Project / Site name: Rail Central

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
628197	TPT008	None Supplied	1.60-2.40	Brown clay.
628198	TPT010	None Supplied	2.40-3.00	Brown clay and sand.
628199	TPT011	None Supplied	2.80-3.00	Brown clay and sand.
628200	TPT019	None Supplied	1.50-2.00	Brown clay and sand.
628201	TPT021	None Supplied	1.80-2.40	Brown clay and sand.
628202	TPA011	None Supplied	0.00-0.35	Brown clay and loam with gravel.
628203	TPT005	None Supplied	0.45-1.10	Brown clay and sand.
628204	TPT006	None Supplied	0.00-0.15	Brown clay and loam with gravel.
628205	TPT006	None Supplied	1.10-1.50	Brown clay and sand.
628206	TPA008	None Supplied	0.00-0.35	Brown clay and loam with gravel.
628207	TPG056	None Supplied	0.00-0.30	Brown clay and loam with gravel.
628208	TPG027	None Supplied	0.20	Brown loam and clay with gravel.
628209	TPG020	None Supplied	0.20	Brown loam and clay with gravel.
628210	TPG020	None Supplied	1.40	Brown clay and sand.
628211	TPG028	None Supplied	0.20	Brown loam and clay with gravel.
628212	TPG014	None Supplied	0.20	Brown loam and clay with gravel.
628213	TPR011	None Supplied	0.20	Brown loam and clay with gravel.
628214	TPT026	None Supplied	0.20	Brown loam and clay with gravel.
628215	TPT026	None Supplied	1.00	Brown clay and sand.
628216	TPT019	None Supplied	0.20	Brown loam and clay with gravel.
628217	TPT019	None Supplied	1.20	Brown loam and clay with gravel.
628218	TPT023	None Supplied	0.20	Brown loam and clay with gravel.
628219	TPR008	None Supplied	0.20	Brown loam and clay with gravel.
628220	TPR008	None Supplied	1.00	Brown clay and sand.
628221	TPT025	None Supplied	0.20	Brown loam and clay with gravel.
628222	TPT025	None Supplied	1.00	Brown clay and sand.
628223	TPR009	None Supplied	0.20	Brown loam and sand with gravel.
628224	TPR009	None Supplied	1.00	Brown clay and sand.
628225	TPH011	None Supplied	0.20	Brown loam and clay with gravel.
628226	TPG011	None Supplied	1.00	Brown clay and sand.
628227	TPR010	None Supplied	0.20	Brown clay and sand.
628228	TPR010	None Supplied	1.00	Brown clay and sand.
628229	TPG024	None Supplied	0.20	Brown clay and loam with gravel.
628230	TPR015	None Supplied	0.20	Brown clay and sand.
628231	TPG025	None Supplied	0.20	Brown clay and loam with gravel.
628232	TPR004	None Supplied	0.20	Brown loam and clay with gravel.
628233	TPT021	None Supplied	0.20	Brown loam and clay with gravel.
628234	TPT011	None Supplied	0.20	Brown clay and loam with gravel.
628235	TPT008	None Supplied	0.20	Brown clay and loam with gravel.
628236	TPT009	None Supplied	0.20	Brown loam and clay with gravel.
628237	TPT007	None Supplied	0.20	Brown loam and clay with gravel.
628238	TPT010	None Supplied	0.20	Brown loam and clay with gravel.
628239	TPT024	None Supplied	0.20	Brown clay and loam with gravel.
628240	TPT024	None Supplied	1.50	Brown loam and clay with gravel.
628241	TPT022	None Supplied	0.20	Brown clay and loam with gravel.
628242	TPT022	None Supplied	1.50	Brown clay and sand.
628243	TPA004	None Supplied	0.30-0.60	Brown loam and sand with gravel.
628244	TPRT003	None Supplied	0.20	Brown clay and loam with gravel.
628245	TPRT004	None Supplied	0.15	Brown clay and loam with gravel.
628246	TPRT002	None Supplied	0.20	Brown clay and sand.
628247	TPRT001	None Supplied	0.25	Brown clay and sand.
628248	TPL002	None Supplied	0.20	Brown clay and loam with gravel.
628249	TPL001	None Supplied	0.15	Brown clay and loam with gravel.
628250	TPG057	None Supplied	0.25	Brown clay and loam with gravel.
628251	TPG058	None Supplied	0.15	Brown loam and clay with gravel.
628252	TPG062	None Supplied	0.20	Brown loam and clay with gravel.
628253	TPG059	None Supplied	0.20	Brown loam and clay with gravel.
628254	TPG063	None Supplied	0.15	Brown loam and clay with gravel.
628255	TPT001	None Supplied	0.20	Brown loam and clay with gravel.
628256	TPT002	None Supplied	0.30	Brown loam and clay with gravel.
628257	TPL004	None Supplied	0.25	Brown loam and sand with gravel.
628258	TPR003	None Supplied	0.20	Brown loam and clay with gravel.
628259	TPR002	None Supplied	0.15	Brown loam and clay with gravel.
628260	TPG033	None Supplied	0.15	Brown loam and sand with gravel.
628261	TPR013	None Supplied	0.10	Brown loam and clay with gravel.
628262	TPG026	None Supplied	0.20	Brown loam and clay with gravel.
628263	TPR014	None Supplied	0.15	Brown loam and clay with gravel.

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Analytical Report Number : 16-27565

Project / Site name: Rail Central

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
628264	TPG013	None Supplied	0.30	Brown clay and loam with gravel.
628265	TPA005	None Supplied	0.20	Brown loam and clay with gravel.
628266	TPA006	None Supplied	0.15	Brown clay and loam with gravel.
628267	TPG052	None Supplied	0.20	Brown loam and clay with gravel.
628268	TPA001	None Supplied	0.10	Brown loam and sand with gravel.
628269	TPA002	None Supplied	0.25	Brown loam and sand with gravel.
628270	TPA003	None Supplied	0.30	Brown loam and clay with gravel.
628271	TPL003	None Supplied	0.30	Brown loam and clay with gravel.
628272	TPL005	None Supplied	0.15	Brown loam and sand with gravel.
628273	TPL007	None Supplied	0.50	Brown loam and sand with gravel.
628274	TPL008	None Supplied	0.70	Brown clay and sand with gravel.
628275	TPL009	None Supplied	0.25	Brown loam and clay with gravel.
628276	TPL006	None Supplied	0.25	Brown loam and clay with gravel.
628277	TPA024	None Supplied	0.30	Brown loam and sand with gravel.
628278	TPA025	None Supplied	0.10	Brown loam and clay with gravel.
628279	TPA028	None Supplied	0.20	Brown loam and sand with gravel.
628280	TPL011	None Supplied	0.80	Brown sandy loam with gravel.
628281	TPL010	None Supplied	0.15	Brown loam and sand with gravel.
628282	TPL010	None Supplied	2.70	Brown clay and sand with gravel and brick.
628283	TPA044	None Supplied	0.15	Brown clay and loam with gravel.
628284	TPG017	None Supplied	0.10	Brown clay and loam with gravel.
628285	TPA041	None Supplied	0.10	Brown clay and loam with gravel.
628286	TPA040	None Supplied	0.15	Brown clay and loam with gravel.
628287	TPA036	None Supplied	0.10	Brown clay and loam with gravel.
628288	TPA037	None Supplied	0.20	Brown clay and loam with gravel.
628289	TPG021	None Supplied	0.20	Brown loam and clay with gravel.
628391	TPT005	None Supplied	0.00-0.45	Brown loam and clay with gravel.

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Analytical Report Number : 16-27565

Project / Site name: Rail Central

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Fraction of Organic Carbon in soil	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Pesticides and Herbicides in soil screening	In-house method	In-house method		W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
TPH Chromatogram	TPH Chromatogram.	In-house method	L064-PL	D	NONE

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Analytical Report Number : 16-27565

Project / Site name: Rail Central

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding.	L076-PL	D	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

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

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

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Analytical Report Number : 16-28522

Project / Site name:	Rail Central	**Samples received on:**	23/09/2016
Your job number:	C151171	**Samples instructed on:**	23/09/2016
Your order number:	C151171-N9589	**Analysis completed by:**	03/10/2016
Report Issue Number:	1	**Report issued on:**	03/10/2016
Samples Analysed:	45 soil samples		

Signed: 

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

Signed: 

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

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

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

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

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

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634152	634153	634154	634155	634156
Sample Reference				TPRT005	TPRT008	TPRT007	TPRT027	TPRT028
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.30	0.40	0.30
Date Sampled				12/09/2016	12/09/2016	12/09/2016	12/09/2016	12/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	17	15	19	13	12
Total mass of sample received	kg	0.001	NONE	1.2	1.1	1.1	1.1	1.2
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	Chrysotile - Loose fibres
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.5	7.2	6.3	7.8	7.9
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.028	0.017	0.066	0.27	1.7
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	27.6	16.8	66.1	266	1700
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.023	0.019	0.027	0.022	0.017
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	0.39
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	1.6
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	0.46
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	5.0
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	4.4
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	2.4
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	2.2
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	3.1
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	2.5
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	3.2
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	1.7
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	0.33
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	2.0
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	29.2
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	15	17	17	33	30
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.4	1.3	1.2	4.8	1.8
Boron (water soluble)	mg/kg	0.2	MCERTS	3.2	2.5	2.1	2.3	2.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	0.5	0.3
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	49	51	47	32	41
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	50	52	47	32	41
Copper (aqua regia extractable)	mg/kg	1	MCERTS	26	21	25	190	30
Lead (aqua regia extractable)	mg/kg	1	MCERTS	33	28	34	330	41
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.8	0.8	0.6	2.3	0.4
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	22	23	22	63	25
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	4.3	1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	63	62	56	78	73
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	66	60	69	75	93

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634152	634153	634154	634155	634156
Sample Reference				TPRT005	TPRT008	TPRT007	TPRT027	TPRT028
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.30	0.40	0.30
Date Sampled				12/09/2016	12/09/2016	12/09/2016	12/09/2016	12/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	< 8.0	11
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	< 8.0	93
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	-	< 10	100
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	< 8.4	44
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	< 2.0	2.2
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	< 10	23
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	< 10	130
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	< 8.4	92

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Project / Site name: Rail Central
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Lab Sample Number				634152	634153	634154	634155	634156
Sample Reference				TPRT005	TPRT008	TPRT007	TPRT027	TPRT028
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.30	0.40	0.30
Date Sampled				12/09/2016	12/09/2016	12/09/2016	12/09/2016	12/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
N-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
P-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

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Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634152	634153	634154	634155	634156
Sample Reference				TPRT005	TPRT008	TPRT007	TPRT027	TPRT028
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.30	0.40	0.30
Date Sampled				12/09/2016	12/09/2016	12/09/2016	12/09/2016	12/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.1	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-

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Project / Site name: Rail Central
Your Order No: C151171-N9589

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Sample Reference				TPRT005	TPRT008	TPRT007	TPRT027	TPRT028
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.30	0.40	0.30
Date Sampled				12/09/2016	12/09/2016	12/09/2016	12/09/2016	12/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	Absent	-	-	-	-

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634157	634158	634159	634160	634161
Sample Reference				TPR001	TPG035	TPG034	TPG047	TPG049
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.30	0.25	0.50	0.10
Date Sampled				12/09/2016	12/09/2016	13/09/2016	13/09/2016	13/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	11	11	12	17	24
Total mass of sample received	kg	0.001	NONE	1.1	1.3	1.2	1.1	0.95
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	6.4	7.3	7.3	8.3	6.2
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.055	0.039	0.025	0.13	0.040
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	55.1	38.7	24.9	128	39.5
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.023	0.012	0.022	0.014	0.040
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	0.40	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	0.59	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	0.47	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	0.40	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.43	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	0.37	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	0.26	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	0.32	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	3.24	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	26	12	19	23	11
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.4	0.78	0.80	1.9	1.7
Boron (water soluble)	mg/kg	0.2	MCERTS	1.3	1.0	1.3	1.9	3.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	48	30	29	51	63
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	48	30	29	51	64
Copper (aqua regia extractable)	mg/kg	1	MCERTS	36	18	30	70	36
Lead (aqua regia extractable)	mg/kg	1	MCERTS	33	22	29	98	41
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.4	1.1	0.7	1.3	1.9
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	28	17	18	39	24
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	1.7	< 1.0	2.2
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	82	49	47	66	73
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	74	49	140	85	79

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634157	634158	634159	634160	634161
Sample Reference				TPR001	TPG035	TPG034	TPG047	TPG049
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.30	0.25	0.50	0.10
Date Sampled				12/09/2016	12/09/2016	13/09/2016	13/09/2016	13/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	< 1.0	-
Toluene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
o-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	< 1.0	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	< 2.0	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	< 8.0	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	< 8.0	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	-	< 10	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	< 8.4	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	< 1.0	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	< 2.0	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	< 10	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	< 10	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	< 8.4	-

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634157	634158	634159	634160	634161
Sample Reference				TPR001	TPG035	TPG034	TPG047	TPG049
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.30	0.25	0.50	0.10
Date Sampled				12/09/2016	12/09/2016	13/09/2016	13/09/2016	13/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
N-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
P-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634157	634158	634159	634160	634161
Sample Reference				TPR001	TPG035	TPG034	TPG047	TPG049
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.30	0.25	0.50	0.10
Date Sampled				12/09/2016	12/09/2016	13/09/2016	13/09/2016	13/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.1	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634157	634158	634159	634160	634161
Sample Reference				TPR001	TPG035	TPG034	TPG047	TPG049
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.30	0.25	0.50	0.10
Date Sampled				12/09/2016	12/09/2016	13/09/2016	13/09/2016	13/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	Absent	-	-	-

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634162	634163	634164	634165	634166
Sample Reference				TPG050	TPA029	TPA026	TPA022	TPT004
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.15	0.20	0.15	0.15	0.30
Date Sampled				13/09/2016	14/09/2016	14/09/2016	14/09/2016	14/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	16	16	16	14	9.0
Total mass of sample received	kg	0.001	NONE	1.1	1.2	0.49	1.2	1.4
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	6.4	7.2	7.1	7.2	7.2
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.028	0.049	0.016	0.078	0.011
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	28.0	48.7	15.9	77.6	11.3
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.024	0.023	0.020	0.019	0.0044
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	19	21	27	22	19
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.4	1.2	1.2	1.4	1.2
Boron (water soluble)	mg/kg	0.2	MCERTS	1.8	1.1	1.0	1.0	0.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.3	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	55	41	41	51	41
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	55	40	41	51	41
Copper (aqua regia extractable)	mg/kg	1	MCERTS	32	33	28	20	14
Lead (aqua regia extractable)	mg/kg	1	MCERTS	52	86	64	39	21
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.3	1.8	1.0	1.1	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	24	20	23	25	23
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.3	< 1.0	1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	76	62	58	79	79
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	74	69	66	87	69

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634162	634163	634164	634165	634166
Sample Reference				TPG050	TPA029	TPA026	TPA022	TPT004
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.15	0.20	0.15	0.15	0.30
Date Sampled				13/09/2016	14/09/2016	14/09/2016	14/09/2016	14/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	-	< 1.0
Toluene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
o-xylene	µg/kg	1	MCERTS	-	-	-	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	< 8.0
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	-	-	< 10
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	< 8.4
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	< 10
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	< 8.4

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634162	634163	634164	634165	634166
Sample Reference				TPG050	TPA029	TPA026	TPA022	TPT004
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.15	0.20	0.15	0.15	0.30
Date Sampled				13/09/2016	14/09/2016	14/09/2016	14/09/2016	14/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
N-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
P-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634162	634163	634164	634165	634166
Sample Reference				TPG050	TPA029	TPA026	TPA022	TPT004
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.15	0.20	0.15	0.15	0.30
Date Sampled				13/09/2016	14/09/2016	14/09/2016	14/09/2016	14/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.1	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634162	634163	634164	634165	634166
Sample Reference				TPG050	TPA029	TPA026	TPA022	TPT004
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.15	0.20	0.15	0.15	0.30
Date Sampled				13/09/2016	14/09/2016	14/09/2016	14/09/2016	14/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	-	-	-	Absent

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634167	634168	634169	634170	634171
Sample Reference				TPA018	TPA015	TPA027	TPG065	TPA023
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.20	0.20	0.15	0.10
Date Sampled				14/09/2016	14/09/2016	15/09/2016	15/09/2016	15/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	19	25	12	15	15
Total mass of sample received	kg	0.001	NONE	1.1	0.99	1.2	1.4	1.3
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	6.6	6.5	7.2	7.1	7.0
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.059	0.053	0.041	0.028	0.029
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	58.6	53.0	40.6	28.3	28.8
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.027	0.036	0.021	0.021	0.019
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	27	27	16	16	31
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.6	1.7	0.81	0.93	1.3
Boron (water soluble)	mg/kg	0.2	MCERTS	2.2	3.0	1.0	0.9	0.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	60	87	26	32	48
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	60	87	26	32	48
Copper (aqua regia extractable)	mg/kg	1	MCERTS	26	23	24	24	17
Lead (aqua regia extractable)	mg/kg	1	MCERTS	33	37	130	49	39
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.3	1.1	0.7	1.1	0.8
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	40	38	17	19	24
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.1	< 1.0	3.3	1.7	1.7
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	77	88	44	51	79
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	71	94	69	65	81

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634167	634168	634169	634170	634171
Sample Reference				TPA018	TPA015	TPA027	TPG065	TPA023
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.20	0.20	0.15	0.10
Date Sampled				14/09/2016	14/09/2016	15/09/2016	15/09/2016	15/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	-	-	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634167	634168	634169	634170	634171
Sample Reference				TPA018	TPA015	TPA027	TPG065	TPA023
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.20	0.20	0.15	0.10
Date Sampled				14/09/2016	14/09/2016	15/09/2016	15/09/2016	15/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
N-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
P-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634167	634168	634169	634170	634171
Sample Reference				TPA018	TPA015	TPA027	TPG065	TPA023
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.20	0.20	0.15	0.10
Date Sampled				14/09/2016	14/09/2016	15/09/2016	15/09/2016	15/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.1	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634167	634168	634169	634170	634171
Sample Reference				TPA018	TPA015	TPA027	TPG065	TPA023
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.10	0.20	0.20	0.15	0.10
Date Sampled				14/09/2016	14/09/2016	15/09/2016	15/09/2016	15/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	-	Absent	-	-

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634172	634173	634174	634175	634176
Sample Reference				TPA019	TPG061	TPA032	TPA016	TPA034
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.15	0.15	0.10	0.20	0.30
Date Sampled				15/09/2016	15/09/2016	15/09/2016	15/09/2016	08/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	17	15	24	20	16
Total mass of sample received	kg	0.001	NONE	1.1	1.1	1.1	1.1	0.36
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.1	6.6	7.7	6.7	7.9
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.034	0.063	0.065	0.031	0.031
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	33.9	62.9	65.4	31.1	31.4
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.027	0.027	0.036	0.033	0.0048
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	29	21	24	28	9.3
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.6	1.2	1.7	1.5	1.2
Boron (water soluble)	mg/kg	0.2	MCERTS	1.9	1.9	3.3	2.3	2.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	51	48	58	52	46
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	50	48	58	52	46
Copper (aqua regia extractable)	mg/kg	1	MCERTS	21	19	21	26	13
Lead (aqua regia extractable)	mg/kg	1	MCERTS	30	26	29	33	18
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.0	1.2	0.8	1.1	1.8
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	37	23	28	34	19
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	3.2	4.1	1.9	< 1.0	3.7
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	72	63	78	60	50
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	66	61	73	70	51

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634172	634173	634174	634175	634176
Sample Reference				TPA019	TPG061	TPA032	TPA016	TPA034
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.15	0.15	0.10	0.20	0.30
Date Sampled				15/09/2016	15/09/2016	15/09/2016	15/09/2016	08/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	-	-	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634172	634173	634174	634175	634176
Sample Reference				TPA019	TPG061	TPA032	TPA016	TPA034
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.15	0.15	0.10	0.20	0.30
Date Sampled				15/09/2016	15/09/2016	15/09/2016	15/09/2016	08/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
N-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
P-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634172	634173	634174	634175	634176
Sample Reference				TPA019	TPG061	TPA032	TPA016	TPA034
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.15	0.15	0.10	0.20	0.30
Date Sampled				15/09/2016	15/09/2016	15/09/2016	15/09/2016	08/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.1	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634172	634173	634174	634175	634176
Sample Reference				TPA019	TPG061	TPA032	TPA016	TPA034
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.15	0.15	0.10	0.20	0.30
Date Sampled				15/09/2016	15/09/2016	15/09/2016	15/09/2016	08/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	Absent	-	-	-	-

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634177	634178	634179	634180	634181
Sample Reference				TPG019	TPA035	TPRT006	TPA050	TPA049
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.35	0.20	0.00	0.00
Date Sampled				09/09/2016	08/09/2016	09/09/2016	16/09/2016	16/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	15	14	14	15	13
Total mass of sample received	kg	0.001	NONE	0.37	0.42	0.36	0.40	0.39
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.5	7.0	7.5	7.4	7.5
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.022	0.021	0.015	0.010	0.035
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	21.7	20.8	14.5	10.2	35.3
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.0039	0.0073	0.0043	0.031	0.026
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	3.5	5.5	6.3	23	18
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.1	1.4	1.3	1.5	1.4
Boron (water soluble)	mg/kg	0.2	MCERTS	1.0	1.7	1.6	1.5	2.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	47	57	50	29	37
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	47	57	50	29	37
Copper (aqua regia extractable)	mg/kg	1	MCERTS	12	16	15	35	33
Lead (aqua regia extractable)	mg/kg	1	MCERTS	13	16	15	110	69
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.1	1.7	< 0.3	1.0	1.0
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	16	20	22	21	25
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	1.4	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	47	54	49	46	75
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	49	62	50	72	98

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634177	634178	634179	634180	634181
Sample Reference				TPG019	TPA035	TPRT006	TPA050	TPA049
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.35	0.20	0.00	0.00
Date Sampled				09/09/2016	08/09/2016	09/09/2016	16/09/2016	16/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	-	-	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634177	634178	634179	634180	634181
Sample Reference				TPG019	TPA035	TPRT006	TPA050	TPA049
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.35	0.20	0.00	0.00
Date Sampled				09/09/2016	08/09/2016	09/09/2016	16/09/2016	16/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
N-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
P-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634177	634178	634179	634180	634181
Sample Reference				TPG019	TPA035	TPRT006	TPA050	TPA049
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.35	0.20	0.00	0.00
Date Sampled				09/09/2016	08/09/2016	09/09/2016	16/09/2016	16/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.1	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634177	634178	634179	634180	634181
Sample Reference				TPG019	TPA035	TPRT006	TPA050	TPA049
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.35	0.20	0.00	0.00
Date Sampled				09/09/2016	08/09/2016	09/09/2016	16/09/2016	16/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	Absent	-	-	-	-

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634182	634183	634184	634185	634186
Sample Reference				TPG045	WSCL001	WSCL002	WSCL003	WSCL004
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00	0.20	0.20	0.20	0.20
Date Sampled				16/09/2016	20/09/2016	20/09/2016	20/09/2016	20/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	10	18	19	8.3	16
Total mass of sample received	kg	0.001	NONE	0.41	0.46	0.49	0.49	0.50
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.7	7.1	7.6	7.7	7.3
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.015	0.017	0.039	0.028	0.029
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	15.3	17.0	39.1	28.3	28.7
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.025	0.021	0.026	0.023	0.020
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	32	19	9.5	13	10
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.7	1.1	1.1	0.83	1.0
Boron (water soluble)	mg/kg	0.2	MCERTS	1.3	1.2	1.2	1.6	1.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	57	42	45	38	38
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	57	42	45	38	38
Copper (aqua regia extractable)	mg/kg	1	MCERTS	33	20	24	14	16
Lead (aqua regia extractable)	mg/kg	1	MCERTS	190	22	24	25	19
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.7	0.7	0.7	0.7	0.4
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	33	18	19	18	16
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.8	3.2	1.4	1.9	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	82	51	51	55	55
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	81	55	53	68	68

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634182	634183	634184	634185	634186
Sample Reference				TPG045	WSCL001	WSCL002	WSCL003	WSCL004
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00	0.20	0.20	0.20	0.20
Date Sampled				16/09/2016	20/09/2016	20/09/2016	20/09/2016	20/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	< 1.0	-	-
Toluene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
o-xylene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	< 0.1	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	< 0.1	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	< 0.1	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	< 1.0	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	< 2.0	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	< 8.0	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	< 8.0	-	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	< 10	-	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	< 8.4	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	< 0.1	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	< 0.1	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	< 0.1	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	< 1.0	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	< 2.0	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	< 10	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	< 10	-	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	< 8.4	-	-

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634182	634183	634184	634185	634186
Sample Reference				TPG045	WSCL001	WSCL002	WSCL003	WSCL004
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00	0.20	0.20	0.20	0.20
Date Sampled				16/09/2016	20/09/2016	20/09/2016	20/09/2016	20/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
Chloroethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Bromomethane	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
Vinyl Chloride	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,1-dichloroethene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,1-dichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Trichloromethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,2-dichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
Benzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,2-dichloropropane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Trichloroethene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Dibromomethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
Toluene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
Tetrachloroethene	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
p & m-xylene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Styrene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Tribromomethane	µg/kg	1	NONE	-	-	< 1.0	< 1.0	-
o-xylene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Bromobenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
N-Propylbenzene	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
Tert-Butylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
Sec-Butylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,3-dichlorobenzene	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
P-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
1,2-dichlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,4-dichlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Butylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	< 1.0	< 1.0	-

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634182	634183	634184	634185	634186
Sample Reference				TPG045	WSCL001	WSCL002	WSCL003	WSCL004
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00	0.20	0.20	0.20	0.20
Date Sampled				16/09/2016	20/09/2016	20/09/2016	20/09/2016	20/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	-
Phenol	mg/kg	0.2	ISO 17025	-	-	< 0.2	< 0.2	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	< 0.2	< 0.2	-
Isophorone	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	< 0.1	< 0.1	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1	-
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	< 0.10	< 0.10	-
Acenaphthene	mg/kg	0.1	MCERTS	-	-	< 0.10	< 0.10	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	< 0.3	< 0.3	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	-
Fluorene	mg/kg	0.1	MCERTS	-	-	< 0.10	< 0.10	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	-
Phenanthrene	mg/kg	0.1	MCERTS	-	-	< 0.10	< 0.10	-
Anthracene	mg/kg	0.1	MCERTS	-	-	< 0.10	< 0.10	-
Carbazole	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	-
Fluoranthene	mg/kg	0.1	MCERTS	-	-	< 0.10	< 0.10	-
Pyrene	mg/kg	0.1	MCERTS	-	-	< 0.10	< 0.10	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	< 0.3	< 0.3	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	< 0.10	< 0.10	-
Chrysene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	< 0.10	< 0.10	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	< 0.10	< 0.10	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	< 0.10	< 0.10	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	< 0.10	< 0.10	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	< 0.10	< 0.10	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	-

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634182	634183	634184	634185	634186
Sample Reference				TPG045	WSCL001	WSCL002	WSCL003	WSCL004
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00	0.20	0.20	0.20	0.20
Date Sampled				16/09/2016	20/09/2016	20/09/2016	20/09/2016	20/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	-	-	Absent	-

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634187	634188	634189	634190	634191
Sample Reference				WSLF001	WSLF002	WSLF002	WSLF003	WSLF003
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.20	1.20	0.20	1.30
Date Sampled				21/09/2016	21/09/2016	21/09/2016	21/09/2016	21/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	12	11	17	13	20
Total mass of sample received	kg	0.001	NONE	0.52	0.53	0.46	0.40	0.54
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.7	7.7	8.2	7.9	8.5
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.012	0.092	0.12	0.11	0.26
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	11.5	91.6	119	105	260
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.018	0.0074	0.0055	0.032	0.0074
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.26	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	1.2	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	0.73	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	6.7	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	1.8	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	9.9	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	8.6	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	3.1	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	3.3	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	3.4	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	2.5	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	3.2	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	1.2	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	0.29	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.5	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	47.8	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14	16	11	24	5.4
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.1	0.79	1.5	7.5	1.2
Boron (water soluble)	mg/kg	0.2	MCERTS	0.9	1.7	1.6	0.9	2.0
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	40	27	52	27	50
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	41	27	52	27	50
Copper (aqua regia extractable)	mg/kg	1	MCERTS	32	18	26	100	22
Lead (aqua regia extractable)	mg/kg	1	MCERTS	35	22	18	26	14
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	1.1	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	22	18	43	64	34
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	4.6	1.3	3.1	4.5	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	56	41	44	80	37
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	160	41	67	90	52

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634187	634188	634189	634190	634191
Sample Reference				WSLF001	WSLF002	WSLF002	WSLF003	WSLF003
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.20	1.20	0.20	1.30
Date Sampled				21/09/2016	21/09/2016	21/09/2016	21/09/2016	21/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	< 1.0	-
Toluene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
o-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	< 1.0	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	< 2.0	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	< 8.0	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	< 8.0	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	-	< 10	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	< 8.4	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	< 1.0	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	< 2.0	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	< 10	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	< 10	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	< 8.4	-

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634187	634188	634189	634190	634191
Sample Reference				WSLF001	WSLF002	WSLF002	WSLF003	WSLF003
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.20	1.20	0.20	1.30
Date Sampled				21/09/2016	21/09/2016	21/09/2016	21/09/2016	21/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chloroethane	µg/kg	1	NONE	-	-	-	-	-
Bromomethane	µg/kg	1	ISO 17025	-	-	-	-	-
Vinyl Chloride	µg/kg	1	NONE	-	-	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	-	-
1,1-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
1,1-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	-	-
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	-	-
1,2-dichloropropane	µg/kg	1	MCERTS	-	-	-	-	-
Trichloroethene	µg/kg	1	MCERTS	-	-	-	-	-
Dibromomethane	µg/kg	1	MCERTS	-	-	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	-	-
Tetrachloroethene	µg/kg	1	NONE	-	-	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
Styrene	µg/kg	1	MCERTS	-	-	-	-	-
Tribromomethane	µg/kg	1	NONE	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
Bromobenzene	µg/kg	1	MCERTS	-	-	-	-	-
N-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	-	-
Sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,3-dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-
P-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	-	-
1,2-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,4-dichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Butylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	-	-

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634187	634188	634189	634190	634191
Sample Reference				WSLF001	WSLF002	WSLF002	WSLF003	WSLF003
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.20	1.20	0.20	1.30
Date Sampled				21/09/2016	21/09/2016	21/09/2016	21/09/2016	21/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	-	-
Phenol	mg/kg	0.2	ISO 17025	-	-	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	-	-
Isophorone	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.1	MCERTS	-	-	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Carbazole	mg/kg	0.3	MCERTS	-	-	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634187	634188	634189	634190	634191
Sample Reference				WSLF001	WSLF002	WSLF002	WSLF003	WSLF003
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.20	1.20	0.20	1.30
Date Sampled				21/09/2016	21/09/2016	21/09/2016	21/09/2016	21/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	-	-	-	-

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634192	634193	634195	634196	634197
Sample Reference				WSLF004	WSLF004	TPG036	TPG031	TPG032
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	1.40	0.10	0.20	0.20
Date Sampled				21/09/2016	21/09/2016	20/09/2016	20/09/2016	20/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	5.6	18	6.3	9.4	11
Total mass of sample received	kg	0.001	NONE	0.49	0.47	0.50	0.53	0.53
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile- Hard/ cement type material	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.7	8.5	7.4	6.6	7.1
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.33	0.095	0.018	0.0073	0.020
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	333	94.9	18.2	7.3	20.0
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.032	0.0074	0.0094	0.012	0.013
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.50	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	1.3	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	1.7	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	2.1	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	29	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	8.3	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	38	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	32	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	17	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	14	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	19	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	15	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	21	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	12	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	3.3	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	15	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	230	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	26	14	16	12	8.8
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	3.1	1.2	0.66	0.80	0.76
Boron (water soluble)	mg/kg	0.2	MCERTS	1.4	1.8	0.8	0.6	0.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.4	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	43	50	22	29	23
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	42	50	22	29	22
Copper (aqua regia extractable)	mg/kg	1	MCERTS	25	23	15	17	20
Lead (aqua regia extractable)	mg/kg	1	MCERTS	39	16	32	36	38
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.7	0.6	0.7	0.8
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	21	31	13	16	14
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	4.6	1.5	1.5	1.1	1.8
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	87	37	33	50	37
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	110	56	48	67	61

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634192	634193	634195	634196	634197
Sample Reference				WSLF004	WSLF004	TPG036	TPG031	TPG032
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	1.40	0.10	0.20	0.20
Date Sampled				21/09/2016	21/09/2016	20/09/2016	20/09/2016	20/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	-	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	-	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	-	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	1.4	< 1.0	< 1.0	-	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	21	< 2.0	< 2.0	-	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	75	< 8.0	< 8.0	-	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	620	< 8.0	< 8.0	-	< 8.0
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	700	< 10	< 10	-	< 10
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	390	< 8.4	< 8.4	-	< 8.4
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	-	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	-	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	-	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	3.4	< 1.0	< 1.0	-	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	46	< 2.0	< 2.0	-	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	360	< 10	< 10	-	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	1600	< 10	< 10	-	< 10
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	1400	< 8.4	< 8.4	-	< 8.4

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634192	634193	634195	634196	634197
Sample Reference				WSLF004	WSLF004	TPG036	TPG031	TPG032
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	1.40	0.10	0.20	0.20
Date Sampled				21/09/2016	21/09/2016	20/09/2016	20/09/2016	20/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	-	-	-
Chloroethane	µg/kg	1	NONE	< 1.0	< 1.0	-	-	-
Bromomethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	-	-	-
Vinyl Chloride	µg/kg	1	NONE	< 1.0	< 1.0	-	-	-
Trichlorofluoromethane	µg/kg	1	NONE	< 1.0	< 1.0	-	-	-
1,1-dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	-	-	-
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	-	-	-
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
1,1-dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
2,2-Dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
Trichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
1,1,1-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
1,2-dichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
1,1-Dichloropropene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
Trans-1,2-dichloroethene	µg/kg	1	NONE	< 1.0	< 1.0	-	-	-
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
Tetrachloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
1,2-dichloropropane	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
Trichloroethene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
Dibromomethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
Bromodichloromethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-	-	-
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-	-	-
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
1,1,2-Trichloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
1,3-Dichloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	-	-	-
Dibromochloromethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	-	-	-
Tetrachloroethene	µg/kg	1	NONE	< 1.0	< 1.0	-	-	-
1,2-Dibromoethane	µg/kg	1	ISO 17025	< 1.0	< 1.0	-	-	-
Chlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
Styrene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
Tribromomethane	µg/kg	1	NONE	< 1.0	< 1.0	-	-	-
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
Isopropylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
Bromobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
N-Propylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-	-	-
2-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
4-Chlorotoluene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-	-	-
Tert-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-	-	-
Sec-Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
1,3-dichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-	-	-
P-Isopropyltoluene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-	-	-
1,2-dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
1,4-dichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
Butylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	< 1.0	< 1.0	-	-	-
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
Hexachlorobutadiene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	< 1.0	< 1.0	-	-	-

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

Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634192	634193	634195	634196	634197
Sample Reference				WSLF004	WSLF004	TPG036	TPG031	TPG032
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	1.40	0.10	0.20	0.20
Date Sampled				21/09/2016	21/09/2016	20/09/2016	20/09/2016	20/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	-	-	-
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	-	-	-
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	-	-
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	-	-
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	-	-
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	-	-
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	-	-
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	-	-
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	-	-
Hexachloroethane	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	-	-
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	-	-	-
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	-	-
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	-	-
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	-	-
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	-	-
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	-	-
Naphthalene	mg/kg	0.05	MCERTS	0.50	< 0.05	-	-	-
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	-	-
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	-	-	-
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	-	-
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	-	-	-
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	-	-
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	-	-
2-Methylnaphthalene	mg/kg	0.1	NONE	0.7	< 0.1	-	-	-
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	-	-
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	-	-
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	1.3	< 0.10	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	1.7	< 0.10	-	-	-
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	-	-
Dibenzofuran	mg/kg	0.2	MCERTS	1.7	< 0.2	-	-	-
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	-	-	-
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	-	-
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	-	-
Fluorene	mg/kg	0.1	MCERTS	2.1	< 0.10	-	-	-
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	-	-
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	-	-
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	29	< 0.10	-	-	-
Anthracene	mg/kg	0.1	MCERTS	8.3	< 0.10	-	-	-
Carbazole	mg/kg	0.3	MCERTS	2.4	< 0.3	-	-	-
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-	-	-
Anthraquinone	mg/kg	0.3	MCERTS	2.2	< 0.3	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	38	< 0.10	-	-	-
Pyrene	mg/kg	0.1	MCERTS	32	< 0.10	-	-	-
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	17	< 0.10	-	-	-
Chrysene	mg/kg	0.05	MCERTS	14	< 0.05	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	19	< 0.10	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	15	< 0.10	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	21	< 0.10	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	12	< 0.10	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	3.3	< 0.10	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	15	< 0.05	-	-	-

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Analytical Report Number: 16-28522

Project / Site name: Rail Central
Your Order No: C151171-N9589

Lab Sample Number				634192	634193	634195	634196	634197
Sample Reference				WSLF004	WSLF004	TPG036	TPG031	TPG032
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	1.40	0.10	0.20	0.20
Date Sampled				21/09/2016	21/09/2016	20/09/2016	20/09/2016	20/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	-	-	-	-

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Analytical Report Number : 16-28522

Project / Site name: Rail Central

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
634152	TPRT005	None Supplied	0.20	Brown clay and loam with vegetation.
634153	TPRT008	None Supplied	0.20	Brown clay and loam with vegetation.
634154	TPRT007	None Supplied	0.30	Brown clay and loam with vegetation.
634155	TPRT027	None Supplied	0.40	Brown loam and sand with gravel.
634156	TPRT028	None Supplied	0.30	Brown loam and clay with gravel.
634157	TPR001	None Supplied	0.10	Brown clay and loam with gravel and vegetation.
634158	TPG035	None Supplied	0.30	Brown clay and loam with vegetation.
634159	TPG034	None Supplied	0.25	Brown loam and clay with gravel and vegetation.
634160	TPG047	None Supplied	0.50	Brown clay and loam with brick and vegetation.
634161	TPG049	None Supplied	0.10	Brown loam and clay with gravel and vegetation.
634162	TPG050	None Supplied	0.15	Brown loam and clay with gravel and vegetation.
634163	TPA029	None Supplied	0.20	Brown loam and sand with gravel and vegetation.
634164	TPA026	None Supplied	0.15	Brown loam and sand with gravel and vegetation.
634165	TPA022	None Supplied	0.15	Brown loam and sand with gravel and vegetation.
634166	TPT004	None Supplied	0.30	Brown loam and sand with gravel.
634167	TPA018	None Supplied	0.10	Brown loam and clay with gravel and vegetation.
634168	TPA015	None Supplied	0.20	Brown loam and clay with gravel and vegetation.
634169	TPA027	None Supplied	0.20	Brown loam and sand with gravel and vegetation.
634170	TPG065	None Supplied	0.15	Brown loam and sand with gravel and vegetation.
634171	TPA023	None Supplied	0.10	Brown loam and sand with gravel and vegetation.
634172	TPA019	None Supplied	0.15	Brown loam and clay with gravel and vegetation.
634173	TPG061	None Supplied	0.15	Brown loam and clay with gravel and vegetation.
634174	TPA032	None Supplied	0.10	Brown loam and clay with gravel and vegetation.
634175	TPA016	None Supplied	0.20	Brown loam and clay with gravel and vegetation.
634176	TPA034	None Supplied	0.30	Light brown clay and sand with gravel.
634177	TPG019	None Supplied	0.30	Light brown clay and sand with gravel.
634178	TPA035	None Supplied	0.35	Light brown clay and sand with gravel.
634179	TPRT006	None Supplied	0.20	Light brown clay and sand with gravel.
634180	TPA050	None Supplied	0.00	Brown loam and sand with gravel and vegetation.
634181	TPA049	None Supplied	0.00	Brown loam and sand with gravel.
634182	TPG045	None Supplied	0.00	Brown loam and sand with gravel.
634183	WSCL001	None Supplied	0.20	Brown loam and clay with gravel and vegetation.
634184	WSCL002	None Supplied	0.20	Brown loam and clay with gravel and vegetation.
634185	WSCL003	None Supplied	0.20	Brown loam and clay with gravel and vegetation.
634186	WSCL004	None Supplied	0.20	Brown loam and clay with gravel and vegetation.
634187	WSLF001	None Supplied	0.30	Brown loam and clay with gravel and vegetation.
634188	WSLF002	None Supplied	0.20	Brown loam and clay with gravel.
634189	WSLF002	None Supplied	1.20	Brown clay.
634190	WSLF003	None Supplied	0.20	Brown loam and sand with gravel and vegetation.
634191	WSLF003	None Supplied	1.30	Grey clay.
634192	WSLF004	None Supplied	0.20	Brown loam and sand with gravel and vegetation.
634193	WSLF004	None Supplied	1.40	Grey clay.
634195	TPG036	None Supplied	0.10	Brown sandy loam with gravel and vegetation.
634196	TPG031	None Supplied	0.20	Brown loam and sand with gravel and vegetation.
634197	TPG032	None Supplied	0.20	Brown loam and sand with gravel and vegetation.

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Analytical Report Number : 16-28522

Project / Site name: Rail Central

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Fraction of Organic Carbon in soil	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Pesticides and Herbicides in soil screening	In-house method	In-house method		W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
TPH Chromatogram	TPH Chromatogram.	In-house method	L064-PL	D	NONE

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Analytical Report Number : 16-28522

Project / Site name: Rail Central

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding.	L076-PL	D	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

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

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Analytical Report Number : 16-29767

Project / Site name:	Rail Central	**Samples received on:**	07/10/2016
Your job number:	C151171	**Samples instructed on:**	10/10/2016
Your order number:	POP000105	**Analysis completed by:**	19/10/2016
Report Issue Number:	1	**Report issued on:**	19/10/2016
Samples Analysed:	52 soil samples		

Signed: _____

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

Signed: _____

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

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

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

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

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

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

Analytical Report Number: 16-29767

Project / Site name: Rail Central
Your Order No: POP000105

Lab Sample Number				641468	641469	641470	641471	641472
Sample Reference				TPA039	TPG018	TPG008	TPA043	TPA038
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.30	0.20	0.20
Date Sampled				28/09/2016	30/09/2016	28/09/2016	28/09/2016	28/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	16	19	19	24	17
Total mass of sample received	kg	0.001	NONE	0.44	0.45	0.44	0.43	0.46
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	6.6	8.0	7.0	7.1	7.5
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.026	0.016	0.012	0.015	0.016
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	26.0	16.0	11.7	14.6	16.0
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.013	0.023	0.023	0.030	0.014
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.7	11	5.5	13	12
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.2	1.5	0.94	1.6	1.0
Boron (water soluble)	mg/kg	0.2	MCERTS	0.9	2.3	1.5	1.9	1.0
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	38	42	34	52	36
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	38	43	35	53	37
Copper (aqua regia extractable)	mg/kg	1	MCERTS	17	21	17	17	15
Lead (aqua regia extractable)	mg/kg	1	MCERTS	21	33	23	29	19
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	0.6
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	21	21	15	20	16
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	59	78	52	86	53
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	59	72	55	68	52

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Analytical Report Number: 16-29767

Project / Site name: Rail Central
Your Order No: POP000105

Lab Sample Number				641468	641469	641470	641471	641472
Sample Reference				TPA039	TPG018	TPG008	TPA043	TPA038
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.30	0.20	0.20
Date Sampled				28/09/2016	30/09/2016	28/09/2016	28/09/2016	28/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	-	-	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-
TPH (C35 - C44)	mg/kg	10	NONE	-	-	-	-	-
TPH (C5 - C6)	mg/kg	1	NONE	-	-	-	-	-
TPH (C6 - C7)	mg/kg	1	NONE	-	-	-	-	-
TPH (C7 - C8)	mg/kg	1	NONE	-	-	-	-	-
TPH (C8 - C10)	mg/kg	1	NONE	-	-	-	-	-
TPH (C10 - C12)	mg/kg	1	ISO 17025	-	-	-	-	-
TPH (C12 - C16)	mg/kg	1	ISO 17025	-	-	-	-	-
TPH (C16 - C21)	mg/kg	1	ISO 17025	-	-	-	-	-
TPH (C21 - C35)	mg/kg	1	ISO 17025	-	-	-	-	-
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	-	Absent	-	-

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Analytical Report Number: 16-29767

Project / Site name: Rail Central
Your Order No: POP000105

Lab Sample Number				641473	641474	641475	641476	641477
Sample Reference				TPG006	TPA042	TPG022	TPG015	TPR012
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.30	0.20	0.30	0.20
Date Sampled				29/09/2016	28/09/2016	29/09/2016	29/09/2016	30/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	17	17	17	19	19
Total mass of sample received	kg	0.001	NONE	0.48	0.35	0.48	0.41	0.47
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.2	7.0	7.7	7.6	7.3
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.013	0.023	0.016	0.023	0.020
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	12.8	23.2	15.7	22.7	19.6
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.014	0.017	0.018	0.020	0.017
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	18	14	11	7.1	6.8
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.5	1.3	0.94	0.97	0.97
Boron (water soluble)	mg/kg	0.2	MCERTS	0.6	0.9	1.2	1.1	0.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	51	40	29	35	35
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	52	41	29	35	35
Copper (aqua regia extractable)	mg/kg	1	MCERTS	18	9.9	16	20	17
Lead (aqua regia extractable)	mg/kg	1	MCERTS	21	16	20	23	22
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	21	14	14	15	16
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	94	64	43	42	40
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	72	49	46	51	47

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Analytical Report Number: 16-29767

Project / Site name: Rail Central
Your Order No: POP000105

Lab Sample Number				641473	641474	641475	641476	641477
Sample Reference				TPG006	TPA042	TPG022	TPG015	TPR012
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.30	0.20	0.30	0.20
Date Sampled				29/09/2016	28/09/2016	29/09/2016	29/09/2016	30/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	-	-	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-
TPH (C35 - C44)	mg/kg	10	NONE	-	-	-	-	-
TPH (C5 - C6)	mg/kg	1	NONE	-	-	-	-	-
TPH (C6 - C7)	mg/kg	1	NONE	-	-	-	-	-
TPH (C7 - C8)	mg/kg	1	NONE	-	-	-	-	-
TPH (C8 - C10)	mg/kg	1	NONE	-	-	-	-	-
TPH (C10 - C12)	mg/kg	1	ISO 17025	-	-	-	-	-
TPH (C12 - C16)	mg/kg	1	ISO 17025	-	-	-	-	-
TPH (C16 - C21)	mg/kg	1	ISO 17025	-	-	-	-	-
TPH (C21 - C35)	mg/kg	1	ISO 17025	-	-	-	-	-
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	Absent	-	-	-	-

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Analytical Report Number: 16-29767

Project / Site name: Rail Central
Your Order No: POP000105

Lab Sample Number				641478	641479	641480	641481	641482
Sample Reference				TPG005	TPG046	TPG051	TPG010	TPG023
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.00-0.30	0.30	0.30	0.20
Date Sampled				29/09/2016	15/09/2016	05/09/2016	29/09/2016	30/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	18	17	12	18	18
Total mass of sample received	kg	0.001	NONE	0.42	0.45	0.51	0.46	0.50
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.4	7.7	7.3	7.1	7.7
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.026	0.084	0.014	0.011	0.0085
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	26.2	83.8	14.1	11.2	8.5
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.018	0.021	0.016	0.017	0.016
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.0	8.9	12	8.5	12
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.3	1.1	0.99	0.87	1.0
Boron (water soluble)	mg/kg	0.2	MCERTS	0.9	1.5	0.8	1.0	1.0
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	40	36	34	31	32
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	41	37	35	31	33
Copper (aqua regia extractable)	mg/kg	1	MCERTS	24	24	17	20	16
Lead (aqua regia extractable)	mg/kg	1	MCERTS	28	27	27	21	22
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	16	16	16	14	16
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	56	55	64	38	39
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	54	62	59	49	49

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Analytical Report Number: 16-29767

Project / Site name: Rail Central
Your Order No: POP000105

Lab Sample Number				641478	641479	641480	641481	641482
Sample Reference				TPG005	TPG046	TPG051	TPG010	TPG023
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.00-0.30	0.30	0.30	0.20
Date Sampled				29/09/2016	15/09/2016	05/09/2016	29/09/2016	30/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	-	-	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-
TPH (C35 - C44)	mg/kg	10	NONE	-	-	-	-	-
TPH (C5 - C6)	mg/kg	1	NONE	-	-	-	-	-
TPH (C6 - C7)	mg/kg	1	NONE	-	-	-	-	-
TPH (C7 - C8)	mg/kg	1	NONE	-	-	-	-	-
TPH (C8 - C10)	mg/kg	1	NONE	-	-	-	-	-
TPH (C10 - C12)	mg/kg	1	ISO 17025	-	-	-	-	-
TPH (C12 - C16)	mg/kg	1	ISO 17025	-	-	-	-	-
TPH (C16 - C21)	mg/kg	1	ISO 17025	-	-	-	-	-
TPH (C21 - C35)	mg/kg	1	ISO 17025	-	-	-	-	-
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	-	-	-	Absent

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

Analytical Report Number: 16-29767

Project / Site name: Rail Central
Your Order No: POP000105

Lab Sample Number				641483	641484	641485	641486	641487
Sample Reference				TPA047	TPA048	TPG044	TPA046	TPA049
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.10-1.40	0.00-0.30	0.00-0.30	0.20	0.20
Date Sampled				26/09/2016	26/09/2016	26/09/2016	29/09/2016	29/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	22	17	16	18	17
Total mass of sample received	kg	0.001	NONE	0.41	0.43	0.41	0.47	0.45
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.4	6.1	6.6	7.4	7.7
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.013	0.025	0.031	0.027	0.015
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	12.9	24.5	31.0	26.6	15.0
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.0031	0.020	0.020	0.018	0.023
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	26	14	22	8.6	20
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.7	0.84	0.91	0.88	1.3
Boron (water soluble)	mg/kg	0.2	MCERTS	0.4	0.7	0.8	0.9	1.0
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	41	26	29	31	40
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	41	26	29	31	41
Copper (aqua regia extractable)	mg/kg	1	MCERTS	20	15	18	15	17
Lead (aqua regia extractable)	mg/kg	1	MCERTS	35	23	49	20	23
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	47	15	20	13	16
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	90	40	58	43	72
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	97	52	75	42	60

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Analytical Report Number: 16-29767

Project / Site name: Rail Central
Your Order No: POP000105

Lab Sample Number				641483	641484	641485	641486	641487
Sample Reference				TPA047	TPA048	TPG044	TPA046	TPA049
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.10-1.40	0.00-0.30	0.00-0.30	0.20	0.20
Date Sampled				26/09/2016	26/09/2016	26/09/2016	29/09/2016	29/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	-	-	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-
TPH (C35 - C44)	mg/kg	10	NONE	-	-	-	-	-
TPH (C5 - C6)	mg/kg	1	NONE	-	-	-	-	-
TPH (C6 - C7)	mg/kg	1	NONE	-	-	-	-	-
TPH (C7 - C8)	mg/kg	1	NONE	-	-	-	-	-
TPH (C8 - C10)	mg/kg	1	NONE	-	-	-	-	-
TPH (C10 - C12)	mg/kg	1	ISO 17025	-	-	-	-	-
TPH (C12 - C16)	mg/kg	1	ISO 17025	-	-	-	-	-
TPH (C16 - C21)	mg/kg	1	ISO 17025	-	-	-	-	-
TPH (C21 - C35)	mg/kg	1	ISO 17025	-	-	-	-	-
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	-	Absent	-	-

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Analytical Report Number: 16-29767

Project / Site name: Rail Central
Your Order No: POP000105

Lab Sample Number				641488	641489	641490	641491	641492
Sample Reference				TPG016	TPG038	TPG042	TPG039	TPG040
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.00-0.30	0.00-0.30	0.00-0.30	0.30
Date Sampled				29/09/2016	27/09/2016	27/09/2016	27/09/2016	27/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	14	14	7.4	7.2	13
Total mass of sample received	kg	0.001	NONE	0.45	0.43	0.47	0.44	0.40
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.6	6.5	6.3	6.4	6.9
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.012	0.017	0.0058	0.0086	0.012
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	12.4	17.1	5.8	8.6	11.6
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.013	0.018	0.013	0.0091	0.020
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.0	4.2	7.5	11	11
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.4	0.35	0.53	0.52	0.67
Boron (water soluble)	mg/kg	0.2	MCERTS	0.9	0.4	0.6	0.3	0.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	37	12	18	20	24
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	38	12	19	20	24
Copper (aqua regia extractable)	mg/kg	1	MCERTS	15	12	15	11	17
Lead (aqua regia extractable)	mg/kg	1	MCERTS	24	31	27	18	93
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	8.1	12	12	13
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	5.7	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	64	23	33	36	43
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	58	35	42	39	53

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Analytical Report Number: 16-29767

Project / Site name: Rail Central
Your Order No: POP000105

Lab Sample Number				641488	641489	641490	641491	641492
Sample Reference				TPG016	TPG038	TPG042	TPG039	TPG040
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.00-0.30	0.00-0.30	0.00-0.30	0.30
Date Sampled				29/09/2016	27/09/2016	27/09/2016	27/09/2016	27/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	-	-	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-
TPH (C35 - C44)	mg/kg	10	NONE	-	-	-	-	-
TPH (C5 - C6)	mg/kg	1	NONE	-	-	-	-	-
TPH (C6 - C7)	mg/kg	1	NONE	-	-	-	-	-
TPH (C7 - C8)	mg/kg	1	NONE	-	-	-	-	-
TPH (C8 - C10)	mg/kg	1	NONE	-	-	-	-	-
TPH (C10 - C12)	mg/kg	1	ISO 17025	-	-	-	-	-
TPH (C12 - C16)	mg/kg	1	ISO 17025	-	-	-	-	-
TPH (C16 - C21)	mg/kg	1	ISO 17025	-	-	-	-	-
TPH (C21 - C35)	mg/kg	1	ISO 17025	-	-	-	-	-
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	-	-	-	-

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Analytical Report Number: 16-29767

Project / Site name: Rail Central
Your Order No: POP000105

Lab Sample Number				641493	641494	641495	641496	641497
Sample Reference				TPG029	TPG030	TPG037	TPG041	TPG009
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.00-0.30	0.00-0.30	0.00-0.20	0.30
Date Sampled				27/09/2016	27/09/2016	27/09/2016	28/09/2016	28/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	11	8.6	6.4	10	23
Total mass of sample received	kg	0.001	NONE	0.47	0.47	0.35	0.43	0.40
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	6.2	6.2	5.7	6.0	7.6
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.015	0.012	0.20	0.0076	0.024
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	14.8	11.7	201	7.6	23.8
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.018	0.012	0.031	0.015	0.023
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	17	14	13	7.9	22
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.60	0.55	1.2	0.39	1.9
Boron (water soluble)	mg/kg	0.2	MCERTS	0.3	0.2	2.1	0.5	1.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	18	22	37	13	67
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	18	22	38	13	68
Copper (aqua regia extractable)	mg/kg	1	MCERTS	10	12	27	10	22
Lead (aqua regia extractable)	mg/kg	1	MCERTS	20	22	47	23	28
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	1.4	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	11	12	18	8.7	24
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	5.6	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	44	41	48	25	100
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	45	40	72	35	86

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

Analytical Report Number: 16-29767

Project / Site name: Rail Central
Your Order No: POP000105

Lab Sample Number				641493	641494	641495	641496	641497
Sample Reference				TPG029	TPG030	TPG037	TPG041	TPG009
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.00-0.30	0.00-0.30	0.00-0.30	0.00-0.20	0.30
Date Sampled				27/09/2016	27/09/2016	27/09/2016	28/09/2016	28/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	-	-	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	-	-
TPH (C35 - C44)	mg/kg	10	NONE	-	-	-	-	-
TPH (C5 - C6)	mg/kg	1	NONE	-	-	-	-	-
TPH (C6 - C7)	mg/kg	1	NONE	-	-	-	-	-
TPH (C7 - C8)	mg/kg	1	NONE	-	-	-	-	-
TPH (C8 - C10)	mg/kg	1	NONE	-	-	-	-	-
TPH (C10 - C12)	mg/kg	1	ISO 17025	-	-	-	-	-
TPH (C12 - C16)	mg/kg	1	ISO 17025	-	-	-	-	-
TPH (C16 - C21)	mg/kg	1	ISO 17025	-	-	-	-	-
TPH (C21 - C35)	mg/kg	1	ISO 17025	-	-	-	-	-
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	Absent	-	-	-	-

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Analytical Report Number: 16-29767

Project / Site name: Rail Central
Your Order No: POP000105

Lab Sample Number				641498	641499	641500	641501	641502
Sample Reference				WSS07	WSS07	WSS05	WSS05	WSS08
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	1.25	0.50	1.25	1.10
Date Sampled				06/10/2016	06/10/2016	06/10/2016	06/10/2016	06/10/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	3.5	16	2.7	18	12
Total mass of sample received	kg	0.001	NONE	0.53	0.48	0.49	0.53	0.47
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-	Not-detected	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	10.5	-	-	8.3	-
Free Cyanide	mg/kg	1	MCERTS	< 1	-	-	< 1	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.17	-	-	0.020	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	172	-	-	19.9	-
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	< 0.0010	-	-	0.0032	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	-	< 0.05	-
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	-	-	< 0.10	-
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	-	-	< 0.10	-
Fluorene	mg/kg	0.1	MCERTS	< 0.10	-	-	< 0.10	-
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	-	-	< 0.10	-
Anthracene	mg/kg	0.1	MCERTS	< 0.10	-	-	< 0.10	-
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	-	-	< 0.10	-
Pyrene	mg/kg	0.1	MCERTS	< 0.10	-	-	< 0.10	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	-	-	< 0.10	-
Chrysene	mg/kg	0.05	MCERTS	< 0.05	-	-	< 0.05	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	-	-	< 0.10	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	-	-	< 0.10	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	-	-	< 0.10	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	-	-	< 0.10	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	-	-	< 0.10	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	-	-	< 0.05	-
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	-	-	< 1.60	-
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	-	-	1.7	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	< 0.06	-	-	1.1	-
Boron (water soluble)	mg/kg	0.2	MCERTS	0.5	-	-	0.7	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	-	-	< 0.2	-
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	-	-	< 1.2	-
Chromium (III)	mg/kg	1	NONE	11	-	-	38	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	11	-	-	38	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	23	-	-	22	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	6.6	-	-	13	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	-	-	2.1	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	15	-	-	47	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	-	< 1.0	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	48	-	-	36	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	40	-	-	58	-

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Analytical Report Number: 16-29767

Project / Site name: Rail Central
Your Order No: POP000105

Lab Sample Number				641498	641499	641500	641501	641502
Sample Reference				WSS07	WSS07	WSS05	WSS05	WSS08
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	1.25	0.50	1.25	1.10
Date Sampled				06/10/2016	06/10/2016	06/10/2016	06/10/2016	06/10/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	< 8.0
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	-	-	< 10
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	-	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	< 10
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4
TPH (C35 - C44)	mg/kg	10	NONE	< 10	< 10	< 10	< 10	-
TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	-
TPH (C6 - C7)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	-
TPH (C7 - C8)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	-
TPH (C8 - C10)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	-
TPH (C10 - C12)	mg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	-
TPH (C12 - C16)	mg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	-
TPH (C16 - C21)	mg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	-
TPH (C21 - C35)	mg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	-
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	-	-	-	-

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Analytical Report Number: 16-29767

Project / Site name: Rail Central
Your Order No: POP000105

Lab Sample Number				641503	641504	641505	641506	641507
Sample Reference				WSS06	WSS06	WSS06	WSS02	WSS02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	1.00	1.25	0.40	1.30
Date Sampled				06/10/2016	06/10/2016	06/10/2016	05/10/2016	05/10/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	3.3	9.0	19	2.7	18
Total mass of sample received	kg	0.001	NONE	0.53	0.50	0.49	0.54	0.49
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-	-	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	10.3	-	-	-	8.5
Free Cyanide	mg/kg	1	MCERTS	< 1	-	-	-	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.16	-	-	-	0.064
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	159	-	-	-	63.8
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	< 0.0010	-	-	-	0.0039
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	< 0.05
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	< 0.10
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	< 0.10
Fluorene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	< 0.10
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	< 0.10
Anthracene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	< 0.10
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	< 0.10
Pyrene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	< 0.10
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	< 0.10
Chrysene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	< 0.10
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	< 0.10
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	-	-	-	< 1.60
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	3.7	-	-	-	15
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	< 0.06	-	-	-	1.2
Boron (water soluble)	mg/kg	0.2	MCERTS	0.9	-	-	-	0.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	-	-	-	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	-	-	-	< 1.2
Chromium (III)	mg/kg	1	NONE	14	-	-	-	37
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	14	-	-	-	38
Copper (aqua regia extractable)	mg/kg	1	MCERTS	24	-	-	-	26
Lead (aqua regia extractable)	mg/kg	1	MCERTS	6.4	-	-	-	13
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	-	-	-	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	13	-	-	-	33
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	-	-	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	51	-	-	-	32
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	41	-	-	-	64

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Analytical Report Number: 16-29767

Project / Site name: Rail Central
Your Order No: POP000105

Lab Sample Number				641503	641504	641505	641506	641507
Sample Reference				WSS06	WSS06	WSS06	WSS02	WSS02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	1.00	1.25	0.40	1.30
Date Sampled				06/10/2016	06/10/2016	06/10/2016	05/10/2016	05/10/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	< 1.0	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	< 2.0	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	< 8.0	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	120	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	-	120	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	100	< 8.4
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	-	< 0.1	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	< 1.0	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	3.1	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	< 10	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	170	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	180	< 8.4
TPH (C35 - C44)	mg/kg	10	NONE	< 10	< 10	< 10	-	< 10
TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	-	< 1.0
TPH (C6 - C7)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	-	< 1.0
TPH (C7 - C8)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	-	< 1.0
TPH (C8 - C10)	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	-	< 1.0
TPH (C10 - C12)	mg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	-	< 1.0
TPH (C12 - C16)	mg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	-	< 1.0
TPH (C16 - C21)	mg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	-	< 1.0
TPH (C21 - C35)	mg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	-	< 1.0
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	-	-	-	-

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

Analytical Report Number: 16-29767

Project / Site name: Rail Central
Your Order No: POP000105

Lab Sample Number				641508	641509	641510	641511	641512
Sample Reference				WSS03	WSS03	WSS01	WSS01	WSS04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	1.20	0.30	1.25	0.35
Date Sampled				05/10/2016	05/10/2016	05/10/2016	05/10/2016	05/10/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	5.3	20	1.4	17	3.2
Total mass of sample received	kg	0.001	NONE	0.52	0.46	0.55	0.47	0.54
Asbestos in Soil	Type	N/A	ISO 17025	-	-	Not-detected	-	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	-	-	9.1	-	9.1
Free Cyanide	mg/kg	1	MCERTS	-	-	< 1	-	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	0.016	-	0.020
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	-	16.4	-	20.3
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	-	-	0.0048	-	0.0075
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-	-	< 0.05	-	0.75
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	< 0.10	-	0.20
Acenaphthene	mg/kg	0.1	MCERTS	-	-	< 0.10	-	< 0.10
Fluorene	mg/kg	0.1	MCERTS	-	-	< 0.10	-	0.38
Phenanthrene	mg/kg	0.1	MCERTS	-	-	< 0.10	-	1.3
Anthracene	mg/kg	0.1	MCERTS	-	-	< 0.10	-	0.54
Fluoranthene	mg/kg	0.1	MCERTS	-	-	< 0.10	-	0.86
Pyrene	mg/kg	0.1	MCERTS	-	-	< 0.10	-	0.59
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	< 0.10	-	0.37
Chrysene	mg/kg	0.05	MCERTS	-	-	< 0.05	-	0.48
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	< 0.10	-	0.28
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	< 0.10	-	0.24
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	< 0.10	-	0.26
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	< 0.10	-	< 0.10
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	< 0.10	-	< 0.10
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	< 0.05	-	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	-	-	< 1.60	-	6.29
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	2.8	-	3.6
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	-	< 0.06	-	< 0.06
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	< 0.2	-	0.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	< 0.2	-	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	-	-	< 1.2	-	< 1.2
Chromium (III)	mg/kg	1	NONE	-	-	9.2	-	6.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	9.2	-	5.9
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	60	-	31
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	13	-	6.2
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	< 0.3	-	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	5.1	-	9.2
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	< 1.0	-	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	64	-	54
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	59	-	39

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Analytical Report Number: 16-29767

Project / Site name: Rail Central
Your Order No: POP000105

Lab Sample Number				641508	641509	641510	641511	641512
Sample Reference				WSS03	WSS03	WSS01	WSS01	WSS04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	1.20	0.30	1.25	0.35
Date Sampled				05/10/2016	05/10/2016	05/10/2016	05/10/2016	05/10/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 1.0	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	< 2.0	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	< 8.0	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	< 8.0	-	-	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	< 10	-	-	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	180	< 8.4	220
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	< 0.1	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	< 1.0	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	< 2.0	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	< 10	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	< 10	-	-	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	350	< 8.4	390
TPH (C35 - C44)	mg/kg	10	NONE	< 10	-	530	< 10	610
TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	< 1.0
TPH (C6 - C7)	mg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	< 1.0
TPH (C7 - C8)	mg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	< 1.0
TPH (C8 - C10)	mg/kg	1	NONE	< 1.0	-	< 1.0	< 1.0	< 1.0
TPH (C10 - C12)	mg/kg	1	ISO 17025	< 1.0	-	< 1.0	< 1.0	< 1.0
TPH (C12 - C16)	mg/kg	1	ISO 17025	< 1.0	-	4.4	< 1.0	2.1
TPH (C16 - C21)	mg/kg	1	ISO 17025	< 1.0	-	26	< 1.0	21
TPH (C21 - C35)	mg/kg	1	ISO 17025	< 1.0	-	600	< 1.0	650
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	-	-	-	-

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Analytical Report Number: 16-29767

Project / Site name: Rail Central
Your Order No: POP000105

Lab Sample Number				641513	641514	641515	641516	641517
Sample Reference				WSS04	WSS09	WSS09	HPS01	HPS02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.25	0.35	1.25	0.00	0.00
Date Sampled				05/10/2016	06/10/2016	06/10/2016	08/10/2016	08/10/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	17	2.0	19	38	41
Total mass of sample received	kg	0.001	NONE	0.50	0.49	0.51	0.37	0.39
Asbestos in Soil	Type	N/A	ISO 17025	-	-	-	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	-	-	-	-	-
Free Cyanide	mg/kg	1	MCERTS	-	-	-	-	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	-	-	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	-	-	-	-
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	-	-	-	-	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	-	-	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
Acenaphthylene	mg/kg	0.1	MCERTS	-	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Fluorene	mg/kg	0.1	MCERTS	-	-	-	-	-
Phenanthrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	-	-
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	-	-	-	-	-
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	-	-	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	-	-	-
Chromium (hexavalent)	mg/kg	1.2	MCERTS	-	-	-	-	-
Chromium (III)	mg/kg	1	NONE	-	-	-	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	-	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-

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Analytical Report Number: 16-29767

Project / Site name: Rail Central
Your Order No: POP000105

Lab Sample Number				641513	641514	641515	641516	641517
Sample Reference				WSS04	WSS09	WSS09	HPS01	HPS02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.25	0.35	1.25	0.00	0.00
Date Sampled				05/10/2016	06/10/2016	06/10/2016	08/10/2016	08/10/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	4.6	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	27	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	40	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	-	-	40	< 10	< 10
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	-	-	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	< 10	< 10	< 10
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4	< 8.4	< 8.4	< 8.4
TPH (C35 - C44)	mg/kg	10	NONE	< 10	< 10	-	-	-
TPH (C5 - C6)	mg/kg	1	NONE	< 1.0	< 1.0	-	-	-
TPH (C6 - C7)	mg/kg	1	NONE	< 1.0	< 1.0	-	-	-
TPH (C7 - C8)	mg/kg	1	NONE	< 1.0	< 1.0	-	-	-
TPH (C8 - C10)	mg/kg	1	NONE	< 1.0	< 1.0	-	-	-
TPH (C10 - C12)	mg/kg	1	ISO 17025	< 1.0	< 1.0	-	-	-
TPH (C12 - C16)	mg/kg	1	ISO 17025	< 1.0	< 1.0	-	-	-
TPH (C16 - C21)	mg/kg	1	ISO 17025	< 1.0	< 1.0	-	-	-
TPH (C21 - C35)	mg/kg	1	ISO 17025	< 1.0	< 1.0	-	-	-
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	-	-	-	-

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Analytical Report Number: 16-29767

Project / Site name: Rail Central
Your Order No: POP000105

Lab Sample Number				641518	641519			
Sample Reference				HPS03	HPS04			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.00	0.00			
Date Sampled				08/10/2016	08/10/2016			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	47	43			
Total mass of sample received	kg	0.001	NONE	0.40	0.42			
Asbestos in Soil	Type	N/A	ISO 17025	-	-			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	-	-			
Free Cyanide	mg/kg	1	MCERTS	-	-			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	-			
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	-	-			
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-			
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-	-			
Acenaphthylene	mg/kg	0.1	MCERTS	-	-			
Acenaphthene	mg/kg	0.1	MCERTS	-	-			
Fluorene	mg/kg	0.1	MCERTS	-	-			
Phenanthrene	mg/kg	0.1	MCERTS	-	-			
Anthracene	mg/kg	0.1	MCERTS	-	-			
Fluoranthene	mg/kg	0.1	MCERTS	-	-			
Pyrene	mg/kg	0.1	MCERTS	-	-			
Benzo(a)anthracene	mg/kg	0.1	MCERTS	-	-			
Chrysene	mg/kg	0.05	MCERTS	-	-			
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-			
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	-	-			
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-			
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	-	-			
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	-	-			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-			
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	-	-			
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-			
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	-			
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-			
Chromium (hexavalent)	mg/kg	1.2	MCERTS	-	-			
Chromium (III)	mg/kg	1	NONE	-	-			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-			
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-			

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

Analytical Report Number: 16-29767

Project / Site name: Rail Central
Your Order No: POP000105

Lab Sample Number				641518	641519			
Sample Reference				HPS03	HPS04			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.00	0.00			
Date Sampled				08/10/2016	08/10/2016			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0			
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0			
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0			
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0			
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	3.1	< 2.0			
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	8.3	9.3			
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	ISO 17025	< 10	< 10			
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4			
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1			
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	13			
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	15	39			
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4			
TPH (C35 - C44)	mg/kg	10	NONE	-	-			
TPH (C5 - C6)	mg/kg	1	NONE	-	-			
TPH (C6 - C7)	mg/kg	1	NONE	-	-			
TPH (C7 - C8)	mg/kg	1	NONE	-	-			
TPH (C8 - C10)	mg/kg	1	NONE	-	-			
TPH (C10 - C12)	mg/kg	1	ISO 17025	-	-			
TPH (C12 - C16)	mg/kg	1	ISO 17025	-	-			
TPH (C16 - C21)	mg/kg	1	ISO 17025	-	-			
TPH (C21 - C35)	mg/kg	1	ISO 17025	-	-			
Pesticide and Herbicide Screen								
Pesticides/Herbicides Screen in Soil	P/A	N/A	NONE	-	-			

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Analytical Report Number : 16-29767

Project / Site name: Rail Central

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
641468	TPA039	None Supplied	0.20	Brown loam and clay.
641469	TPG018	None Supplied	0.20	Brown loam and clay with vegetation.
641470	TPG008	None Supplied	0.30	Brown loam and clay with vegetation.
641471	TPA043	None Supplied	0.20	Brown loam and clay.
641472	TPA038	None Supplied	0.20	Brown loam and clay.
641473	TPG006	None Supplied	0.20	Brown loam and clay.
641474	TPA042	None Supplied	0.30	Light brown loam and clay with ash.
641475	TPG022	None Supplied	0.20	Brown loam and clay.
641476	TPG015	None Supplied	0.30	Brown clay and loam with vegetation.
641477	TPR012	None Supplied	0.20	Brown clay and loam.
641478	TPG005	None Supplied	0.20	Brown clay and loam.
641479	TPG046	None Supplied	0.00-0.30	Brown clay and loam.
641480	TPG051	None Supplied	0.30	Brown loam and sand.
641481	TPG010	None Supplied	0.30	Brown clay and loam.
641482	TPG023	None Supplied	0.20	Brown clay and loam.
641483	TPA047	None Supplied	1.10-1.40	Light brown clay and loam with ash.
641484	TPA048	None Supplied	0.00-0.30	Brown loam and sand.
641485	TPG044	None Supplied	0.00-0.30	Brown loam and sand with vegetation.
641486	TPA046	None Supplied	0.20	Brown clay and loam.
641487	TPA049	None Supplied	0.20	Brown loam and clay.
641488	TPG016	None Supplied	0.30	Brown clay and loam.
641489	TPG038	None Supplied	0.00-0.30	Brown loam and sand with vegetation.
641490	TPG042	None Supplied	0.00-0.30	Brown loam and sand.
641491	TPG039	None Supplied	0.00-0.30	Brown loam and sand with gravel.
641492	TPG040	None Supplied	0.30	Brown loam and sand.
641493	TPG029	None Supplied	0.00-0.30	Brown loam and sand.
641494	TPG030	None Supplied	0.00-0.30	Brown loam and sand with vegetation.
641495	TPG037	None Supplied	0.00-0.30	Brown clay and loam with gravel.
641496	TPG041	None Supplied	0.00-0.20	Brown loam and sand with vegetation.
641497	TPG009	None Supplied	0.30	Brown clay and sand.
641498	WSS07	None Supplied	0.30	Light grey sand with gravel and rubble.
641499	WSS07	None Supplied	1.25	Grey clay and sand.
641500	WSS05	None Supplied	0.50	Brown rubble.**
641501	WSS05	None Supplied	1.25	Grey clay and sand with gravel.
641502	WSS08	None Supplied	1.10	Light brown clay and gravel.
641503	WSS06	None Supplied	0.40	Light grey sand with gravel and rubble.
641504	WSS06	None Supplied	1.00	Brown clay and gravel.
641505	WSS06	None Supplied	1.25	Grey clay and sand.
641506	WSS02	None Supplied	0.40	Grey sand with gravel and rubble.
641507	WSS02	None Supplied	1.30	Grey clay and sand.
641508	WSS03	None Supplied	0.50	Light brown sand with gravel and rubble.
641509	WSS03	None Supplied	1.20	Grey clay and sand.
641510	WSS01	None Supplied	0.30	Light grey sand with gravel and tar.
641511	WSS01	None Supplied	1.25	Grey clay and sand.
641512	WSS04	None Supplied	0.35	Grey sand with gravel and tar.
641513	WSS04	None Supplied	1.25	Grey clay and sand.
641514	WSS09	None Supplied	0.35	Grey sand with gravel and rubble.
641515	WSS09	None Supplied	1.25	Grey clay and sand.
641516	HPS01	None Supplied	0.00	Brown loam and clay with vegetation.
641517	HPS02	None Supplied	0.00	Brown loam and clay with vegetation.
641518	HPS03	None Supplied	0.00	Brown loam and clay with vegetation.
641519	HPS04	None Supplied	0.00	Brown clay and loam with vegetation.

**Non MCerts matrix

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Analytical Report Number : 16-29767

Project / Site name: Rail Central

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Fraction of Organic Carbon in soil	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Pesticides and Herbicides in soil screening	In-house method	In-house method		W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
TPH 8 Band (Soil)	Determination of extractable petroleum hydrocarbons in soil.	In-house method	L064/076PL	D	ISO 17025
TPH Chromatogram	TPH Chromatogram.	In-house method	L064-PL	D	NONE

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Analytical Report Number : 16-29767

Project / Site name: Rail Central

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding.	L076-PL	D	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-PL	W	MCERTS

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

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Analytical Report Number : 17-41138

Project / Site name:	Rail Central (Rathvilly Farm)	**Samples received on:**	24/02/2017
Your job number:	C151171	**Samples instructed on:**	24/02/2017
Your order number:	POP005046	**Analysis completed by:**	03/03/2017
Report Issue Number:	1	**Report issued on:**	03/03/2017
Samples Analysed:	6 soil samples		

Signed: _____

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

Signed: _____

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

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

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

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

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

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

Analytical Report Number: 17-41138

Project / Site name: Rail Central (Rathvilly Farm)
Your Order No: POP005046

Lab Sample Number				708922	708923	708924	708925	708926
Sample Reference				TPG066	TPG066	TPG066	TPG068	TPG068
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	1.60	2.50	0.50	1.00
Date Sampled				20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	12	16	13	15	11
Total mass of sample received	kg	0.001	NONE	1.3	1.2	1.4	1.2	1.2
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	Chrysotile- Loose fibres	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.0	7.9	7.7	7.8	7.9
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.057	0.31	0.090	0.86	0.59
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.0050	0.019	0.0024	0.0069	0.019
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	3.8	< 0.05	< 0.05	0.65
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10	0.21	< 0.10	< 0.10	0.19
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	1.1	< 0.10	< 0.10	0.17
Fluorene	mg/kg	0.1	MCERTS	< 0.10	0.62	< 0.10	< 0.10	0.20
Phenanthrene	mg/kg	0.1	MCERTS	< 0.10	2.6	< 0.10	0.27	1.8
Anthracene	mg/kg	0.1	MCERTS	< 0.10	0.81	< 0.10	< 0.10	0.63
Fluoranthene	mg/kg	0.1	MCERTS	< 0.10	3.8	< 0.10	0.45	3.4
Pyrene	mg/kg	0.1	MCERTS	< 0.10	3.4	< 0.10	0.43	2.9
Benzo(a)anthracene	mg/kg	0.1	MCERTS	< 0.10	1.7	< 0.10	0.27	1.7
Chrysene	mg/kg	0.05	MCERTS	< 0.05	1.9	< 0.05	0.21	1.5
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	2.4	< 0.10	0.28	2.0
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	0.71	< 0.10	0.19	0.83
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	1.4	< 0.10	0.23	1.2
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	< 0.10	0.95	< 0.10	< 0.10	0.73
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10	0.23	< 0.10	< 0.10	0.21
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	1.0	< 0.05	< 0.05	0.84
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.60	26.7	< 1.60	2.33	18.9
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	23	25	16	34	20
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.0	1.7	0.70	1.3	1.5
Boron (water soluble)	mg/kg	0.2	MCERTS	1.6	3.3	0.7	1.3	2.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	33	29	23	55	27
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	34	29	23	55	28
Copper (aqua regia extractable)	mg/kg	1	MCERTS	14	110	13	25	110
Lead (aqua regia extractable)	mg/kg	1	MCERTS	31	98	13	41	62
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	20	44	19	29	27
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	56	50	40	78	49
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	77	290	54	150	140

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Analytical Report Number: 17-41138

Project / Site name: Rail Central (Rathvilly Farm)
Your Order No: POP005046

Lab Sample Number				708922	708923	708924	708925	708926
Sample Reference				TPG066	TPG066	TPG066	TPG068	TPG068
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	1.60	2.50	0.50	1.00
Date Sampled				20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	3.9	< 1.0	1.3	1.4
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	16	< 2.0	3.9	10
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	34	< 8.0	< 8.0	26
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	150	< 8.0	28	150
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	MCERTS	< 10	190	< 10	28	170
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	71	< 8.4	10	57
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	4.6	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	12	< 2.0	< 2.0	8.9
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	37	< 10	< 10	26
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	110	< 10	< 10	92
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	40	< 8.4	< 8.4	31

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

Analytical Report Number: 17-41138

Project / Site name: Rail Central (Rathvilly Farm)
Your Order No: POP005046

Lab Sample Number				708927				
Sample Reference				TPG068				
Sample Number				None Supplied				
Depth (m)				2.00				
Date Sampled				20/02/2017				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	13				
Total mass of sample received	kg	0.001	NONE	1.1				
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-				
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected				
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.1				
Free Cyanide	mg/kg	1	MCERTS	< 1				
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.34				
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.0083				
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthylene	mg/kg	0.1	MCERTS	< 0.10				
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10				
Fluorene	mg/kg	0.1	MCERTS	< 0.10				
Phenanthrene	mg/kg	0.1	MCERTS	0.65				
Anthracene	mg/kg	0.1	MCERTS	0.19				
Fluoranthene	mg/kg	0.1	MCERTS	1.2				
Pyrene	mg/kg	0.1	MCERTS	1.0				
Benzo(a)anthracene	mg/kg	0.1	MCERTS	0.52				
Chrysene	mg/kg	0.05	MCERTS	0.55				
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	0.73				
Benzo(k)fluoranthene	mg/kg	0.1	MCERTS	0.38				
Benzo(a)pyrene	mg/kg	0.1	MCERTS	0.58				
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	MCERTS	0.39				
Dibenz(a,h)anthracene	mg/kg	0.1	MCERTS	< 0.10				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.44				
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	6.62				
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.8				
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.87				
Boron (water soluble)	mg/kg	0.2	MCERTS	1.8				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2				
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2				
Chromium (III)	mg/kg	1	NONE	17				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	17				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	25				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	80				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	14				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	29				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	57				

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Analytical Report Number: 17-41138

Project / Site name: Rail Central (Rathvilly Farm)
Your Order No: POP005046

Lab Sample Number				708927				
Sample Reference				TPG068				
Sample Number				None Supplied				
Depth (m)				2.00				
Date Sampled				20/02/2017				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0				
Toluene	µg/kg	1	MCERTS	< 1.0				
Ethylbenzene	µg/kg	1	MCERTS	< 1.0				
p & m-xylene	µg/kg	1	MCERTS	< 1.0				
o-xylene	µg/kg	1	MCERTS	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0				
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	4.5				
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	12				
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	78				
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	MCERTS	90				
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	35				
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1				
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	1.4				
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	4.9				
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	17				
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	74				
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	27				

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Analytical Report Number : 17-41138

Project / Site name: Rail Central (Rathvilly Farm)

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
708922	TPG066	None Supplied	0.50	Brown clay and sand with gravel.
708923	TPG066	None Supplied	1.60	Black clay and sand with gravel.
708924	TPG066	None Supplied	2.50	Brown sandy clay.
708925	TPG068	None Supplied	0.50	Brown sandy clay with gravel.
708926	TPG068	None Supplied	1.00	Black loam and clay with gravel.
708927	TPG068	None Supplied	2.00	Brown sandy clay with gravel.

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Analytical Report Number : 17-41138

Project / Site name: Rail Central (Rathvilly Farm)

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Fraction of Organic Carbon in soil	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
TPH Chromatogram	TPH Chromatogram.	In-house method	L064-PL	D	NONE
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding.	L076-PL	D	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-PL	W	MCERTS

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Analytical Report Number : 17-41138

Project / Site name: Rail Central (Rathvilly Farm)

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

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

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

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Analytical Report Number : 17-50997

Project / Site name:	Rail Central	**Samples received on:**	09/06/2017
Your job number:	C151171	**Samples instructed on:**	09/06/2017
Your order number:	POP009277	**Analysis completed by:**	16/06/2017
Report Issue Number:	1	**Report issued on:**	16/06/2017
Samples Analysed:	21 soil samples		

Signed:

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

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

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

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

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

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

Analytical Report Number: 17-50997

Project / Site name: Rail Central
Your Order No: POP009277

Lab Sample Number				763877	763878	763879	763880	763881
Sample Reference				WSBL01	WSBL02	WSBL02	WSBL02	WSBL02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.30	1.50	2.50	3.50
Date Sampled				06/06/2017	06/06/2017	06/06/2017	06/06/2017	06/06/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	19	15	14	17	4.0
Total mass of sample received	kg	0.001	NONE	1.6	1.6	1.6	0.96	2.0
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.1	8.4	8.2	6.8	7.7
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 as SO4 (2:1) Gallery 16h extraction	g/l	0.00125	MCERTS	0.0235	0.0298	0.0245	0.145	0.0240
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.018	0.011	0.0078	0.058	< 0.0010
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.19	< 0.05	< 0.05	1.3	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.32	0.17	< 0.05	0.56	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.50	0.57	< 0.05	0.17	< 0.05
Pyrene	mg/kg	0.05	MCERTS	0.44	0.52	< 0.05	0.17	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.29	0.37	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.27	0.37	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.30	0.53	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.14	0.35	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.22	0.58	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.35	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.40	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	2.67	4.21	< 0.80	2.15	< 0.80
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	25	30	28	19	10
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.8	1.4	1.5	8.2	0.41
Boron (water soluble)	mg/kg	0.2	MCERTS	0.8	0.4	2.1	3.0	0.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	36	49	47	26	17
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	36	49	47	27	17
Copper (aqua regia extractable)	mg/kg	1	MCERTS	56	20	18	150	11
Lead (aqua regia extractable)	mg/kg	1	MCERTS	73	39	18	16	6.6
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	30	30	32	110	13
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	56	77	69	70	23
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	96	99	85	57	26

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Analytical Report Number: 17-50997

Project / Site name: Rail Central
Your Order No: POP009277

Lab Sample Number				763877	763878	763879	763880	763881
Sample Reference				WSBL01	WSBL02	WSBL02	WSBL02	WSBL02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30	0.30	1.50	2.50	3.50
Date Sampled				06/06/2017	06/06/2017	06/06/2017	06/06/2017	06/06/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	6.9	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	8.1	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	13	< 8.4	< 8.4	< 8.4	< 8.4
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	1.3	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	2.6	< 2.0	< 2.0	10	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	13	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	17	37	< 10	< 10	< 10
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	42	51	16	< 8.4	< 8.4
TPH-CWG - Aromatic >C21 - C35	mg/kg	10	NONE	17	37	< 10	< 10	< 10

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Analytical Report Number: 17-50997

Project / Site name: Rail Central
Your Order No: POP009277

Lab Sample Number				763882	763883	763884	763885	763886
Sample Reference				WSBL04	WSBL05	WSBL05	WSBL05	WSBL06
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	1.30	2.50	3.50	1.20
Date Sampled				06/06/2017	06/06/2017	06/06/2017	06/06/2017	06/06/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	-	-	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	-	-	17	14	14
Total mass of sample received	kg	0.001	NONE	-	-	1.4	1.9	1.7
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	-	-	8.3	7.7	8.0
Free Cyanide	mg/kg	1	MCERTS	-	-	< 1	< 1	< 1
Water Soluble SO4 as SO4 (2:1) Gallery 16h extraction	g/l	0.00125	MCERTS	-	-	0.0938	0.0730	1.26
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	-	-	0.0057	0.0067	0.0095
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	0.14
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	0.65
Fluorene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	0.81
Phenanthrene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	5.4
Anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	1.5
Fluoranthene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	5.8
Pyrene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	4.6
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	2.2
Chrysene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	1.8
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	1.6
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	1.2
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	1.6
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	0.91
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	< 0.05	< 0.05	0.92
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	-	-	< 0.80	< 0.80	29.1
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	-	-	17	14	43
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	-	-	2.4	1.1	1.8
Boron (water soluble)	mg/kg	0.2	MCERTS	-	-	2.8	2.9	3.8
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	-	-	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	-	-	38	37	68
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	38	37	69
Copper (aqua regia extractable)	mg/kg	1	MCERTS	-	-	26	15	33
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	18	13	70
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	-	-	32	23	34
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	-	-	56	54	84
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	-	-	65	70	120

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Analytical Report Number: 17-50997

Project / Site name: Rail Central
Your Order No: POP009277

Lab Sample Number				763882	763883	763884	763885	763886
Sample Reference				WSBL04	WSBL05	WSBL05	WSBL05	WSBL06
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	1.30	2.50	3.50	1.20
Date Sampled				06/06/2017	06/06/2017	06/06/2017	06/06/2017	06/06/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	< 2.0	< 2.0	29
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	< 8.0	< 8.0	67
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	< 8.0	< 8.0	120
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	MCERTS	-	-	< 10	< 10	190
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	< 8.4	< 8.4	15
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	< 2.0	< 2.0	25
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	< 10	< 10	82
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	< 10	< 10	110
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	< 8.4	< 8.4	25
TPH-CWG - Aromatic >C21 - C35	mg/kg	10	NONE	-	-	< 10	< 10	110

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Analytical Report Number: 17-50997

Project / Site name: Rail Central
Your Order No: POP009277

Lab Sample Number				763887	763888	763889	763890	763891
Sample Reference				WSBL07	WSBL07	WSBL07	WSBL08	WSBL08
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	2.50	3.50	1.50	2.50
Date Sampled				06/06/2017	06/06/2017	06/06/2017	06/06/2017	06/06/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	-	< 0.1
Moisture Content	%	N/A	NONE	16	16	21	-	12
Total mass of sample received	kg	0.001	NONE	1.7	1.4	1.7	-	1.5
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.7	7.9	7.8	-	-
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	-	-
Water Soluble SO4 as SO4 (2:1) Gallery 16h extraction	g/l	0.00125	MCERTS	1.49	1.56	1.67	-	-
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.0089	0.0084	0.020	-	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	-
Acenaphthene	mg/kg	0.05	MCERTS	0.54	< 0.05	< 0.05	-	-
Fluorene	mg/kg	0.05	MCERTS	0.42	< 0.05	< 0.05	-	-
Phenanthrene	mg/kg	0.05	MCERTS	3.9	0.51	< 0.05	-	-
Anthracene	mg/kg	0.05	MCERTS	1.1	< 0.05	< 0.05	-	-
Fluoranthene	mg/kg	0.05	MCERTS	6.0	0.98	< 0.05	-	-
Pyrene	mg/kg	0.05	MCERTS	5.2	0.88	< 0.05	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	2.7	0.52	< 0.05	-	-
Chrysene	mg/kg	0.05	MCERTS	2.0	0.44	< 0.05	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.9	0.54	< 0.05	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	1.6	0.26	< 0.05	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	2.0	0.47	< 0.05	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.1	0.29	< 0.05	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.22	< 0.05	< 0.05	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.3	0.31	< 0.05	-	-
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	30.0	5.20	< 0.80	-	-
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	29	25	13	-	-
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.83	0.96	1.3	-	-
Boron (water soluble)	mg/kg	0.2	MCERTS	0.6	1.3	4.2	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	-	-
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	-	-
Chromium (III)	mg/kg	1	NONE	32	45	44	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	32	45	44	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	22	19	32	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	74	70	15	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	16	21	34	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	-	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	46	53	34	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	96	140	72	-	-

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Analytical Report Number: 17-50997

Project / Site name: Rail Central
Your Order No: POP009277

Lab Sample Number				763887	763888	763889	763890	763891
Sample Reference				WSBL07	WSBL07	WSBL07	WSBL08	WSBL08
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	2.50	3.50	1.50	2.50
Date Sampled				06/06/2017	06/06/2017	06/06/2017	06/06/2017	06/06/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	-	-	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	-	-	22
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	-	-	150
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	29	31	-	-	490
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	MCERTS	29	31	-	-	640
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	21	23	-	-	120
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	-	-	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	-	-	1.1
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	6.6	< 2.0	-	-	28
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	28	< 10	-	-	190
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	69	43	-	-	450
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	33	31	-	-	120
TPH-CWG - Aromatic >C21 - C35	mg/kg	10	NONE	69	43	-	-	450

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Analytical Report Number: 17-50997

Project / Site name: Rail Central
Your Order No: POP009277

Lab Sample Number				763892	763893	763894	763895	763896
Sample Reference				WSBL09	WSBL09	WSBL09	WSBL10	WSBL10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	2.20	3.20	0.30	1.50
Date Sampled				06/06/2017	06/06/2017	06/06/2017	06/06/2017	06/06/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	-	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	11	-	13	19	15
Total mass of sample received	kg	0.001	NONE	1.7	-	1.8	1.6	2.0
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Chrysotile- Loose fibres	-	-	Chrysotile- Loose fibres
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Detected	Not-detected	-	Detected
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.4	-	7.5	-	7.8
Free Cyanide	mg/kg	1	MCERTS	< 1	-	< 1	-	< 1
Water Soluble SO4 as SO4 (2:1) Gallery 16h extraction	g/l	0.00125	MCERTS	0.0330	-	< 0.0013	-	0.0305
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	< 0.0010	-	0.011	-	0.0036
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	1.1
Anthracene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	0.27
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	1.4
Pyrene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	1.2
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	0.79
Chrysene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	0.67
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	0.56
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	0.33
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	0.45
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	0.24
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	-	0.31
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	-	< 0.80	-	7.42
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	16	-	24	-	19
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.47	-	0.99	-	0.62
Boron (water soluble)	mg/kg	0.2	MCERTS	0.6	-	1.7	-	0.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	-	< 1.2	-	< 1.2
Chromium (III)	mg/kg	1	NONE	17	-	31	-	20
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	17	-	32	-	20
Copper (aqua regia extractable)	mg/kg	1	MCERTS	25	-	12	-	23
Lead (aqua regia extractable)	mg/kg	1	MCERTS	28	-	17	-	49
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	4.6	-	22	-	11
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	25	-	52	-	39
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	12	-	69	-	45

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

Analytical Report Number: 17-50997

Project / Site name: Rail Central
Your Order No: POP009277

Lab Sample Number				763892	763893	763894	763895	763896
Sample Reference				WSBL09	WSBL09	WSBL09	WSBL10	WSBL10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	2.20	3.20	0.30	1.50
Date Sampled				06/06/2017	06/06/2017	06/06/2017	06/06/2017	06/06/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-	-	-	< 1.0	-
Toluene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
o-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	< 1.0	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	< 1.0	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	< 2.0	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	< 8.0	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	< 8.0	-
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	MCERTS	-	-	-	< 10	-
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	< 8.4	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	< 0.001	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	< 1.0	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	< 2.0	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	< 10	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	32	-
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-	-	-	46	-
TPH-CWG - Aromatic >C21 - C35	mg/kg	10	NONE	-	-	-	32	-

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Analytical Report Number: 17-50997

Project / Site name: Rail Central
Your Order No: POP009277

Lab Sample Number				763897				
Sample Reference				WSBL10				
Sample Number				None Supplied				
Depth (m)				2.50				
Date Sampled				06/06/2017				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	23				
Total mass of sample received	kg	0.001	NONE	1.6				
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-				
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected				
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.9				
Free Cyanide	mg/kg	1	MCERTS	< 1				
Water Soluble SO4 as SO4 (2:1) Gallery 16h extraction	g/l	0.00125	MCERTS	0.215				
Fraction Organic Carbon (FOC)	N/A	0.001	NONE	0.021				
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthylene	mg/kg	0.05	MCERTS	0.81				
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05				
Fluorene	mg/kg	0.05	MCERTS	0.50				
Phenanthrene	mg/kg	0.05	MCERTS	8.1				
Anthracene	mg/kg	0.05	MCERTS	1.3				
Fluoranthene	mg/kg	0.05	MCERTS	4.7				
Pyrene	mg/kg	0.05	MCERTS	7.4				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	3.8				
Chrysene	mg/kg	0.05	MCERTS	2.5				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	2.7				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.66				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	2.6				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.2				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.29				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.3				
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	37.9				
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13				
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.4				
Boron (water soluble)	mg/kg	0.2	MCERTS	3.9				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2				
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2				
Chromium (III)	mg/kg	1	NONE	55				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	55				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	25				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	40				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	31				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	49				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	110				

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Analytical Report Number: 17-50997

Project / Site name: Rail Central
Your Order No: POP009277

Lab Sample Number				763897				
Sample Reference				WSBL10				
Sample Number				None Supplied				
Depth (m)				2.50				
Date Sampled				06/06/2017				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	-				
Toluene	µg/kg	1	MCERTS	-				
Ethylbenzene	µg/kg	1	MCERTS	-				
p & m-xylene	µg/kg	1	MCERTS	-				
o-xylene	µg/kg	1	MCERTS	-				
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-				
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-				
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-				
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-				
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-				
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-				
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-				
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-				
TPH-CWG - Aliphatic >EC16 - EC35	mg/kg	10	MCERTS	-				
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	-				
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-				
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-				
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-				
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-				
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-				
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-				
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-				
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	-				
TPH-CWG - Aromatic >C21 - C35	mg/kg	10	NONE	-				

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Analytical Report Number : 17-50997

Project / Site name: Rail Central

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
763877	WSBL01	None Supplied	0.30	Brown loam and clay with gravel and vegetation.
763878	WSBL02	None Supplied	0.30	Brown loam and clay with gravel and vegetation.
763879	WSBL02	None Supplied	1.50	Light brown clay and sand with gravel.
763880	WSBL02	None Supplied	2.50	Grey gravelly sand.
763881	WSBL02	None Supplied	3.50	Light brown sand.
763882	WSBL04	None Supplied	1.20	-
763883	WSBL05	None Supplied	1.30	-
763884	WSBL05	None Supplied	2.50	Brown clay with gravel.
763885	WSBL05	None Supplied	3.50	Brown clay with gravel.
763886	WSBL06	None Supplied	1.20	Brown clay and sand with gravel and brick.
763887	WSBL07	None Supplied	1.20	Brown clay and sand with gravel and brick.
763888	WSBL07	None Supplied	2.50	Brown clay and sand with gravel and brick.
763889	WSBL07	None Supplied	3.50	Brown clay with gravel.
763890	WSBL08	None Supplied	1.50	-
763891	WSBL08	None Supplied	2.50	Brown clay and sand with gravel and plastic.
763892	WSBL09	None Supplied	1.20	Brown clay and sand with gravel.
763893	WSBL09	None Supplied	2.20	-
763894	WSBL09	None Supplied	3.20	Brown clay and sand with vegetation.
763895	WSBL10	None Supplied	0.30	Brown loam and clay with gravel and vegetation.
763896	WSBL10	None Supplied	1.50	Brown clay and sand with gravel.
763897	WSBL10	None Supplied	2.50	Brown clay and sand with gravel.

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Analytical Report Number : 17-50997

Project / Site name: Rail Central

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Fraction of Organic Carbon in soil	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil by Gallery 16hr	Determination of water soluble Sulphate by discrete analyser (precipitation method).	In house method based on BS1377-3: 1990.	L082B-PL	D	MCERTS
TPH Chromatogram	TPH Chromatogram.	In-house method	L064-PL	D	NONE
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding.	L076-PL	D	NONE
TPH7 (Soil)	Determination of dichloromethane/hexane extractable hydrocarbons in soil by GC-MS, speciation by interpretation.	In-house method	L064-PL	D	NONE

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Analytical Report Number : 17-50997

Project / Site name: Rail Central

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

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

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Analytical Report Number : 17-51178

Project / Site name:	Rail Central	**Samples received on:**	13/06/2017
Your job number:	C151171	**Samples instructed on:**	13/06/2017
Your order number:	POP009277	**Analysis completed by:**	20/06/2017
Report Issue Number:	1	**Report issued on:**	20/06/2017
Samples Analysed:	1 bulk sample		

Signed:

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

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

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

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

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

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Analytical Report Number: 17-51178

Project / Site name: Rail Central

Lab Sample Number				764986				
Sample Reference				WSBL06				
Sample Number				None Supplied				
Depth (m)				3.00				
Date Sampled				06/06/2017				
Time Taken				None Supplied				
Analytical Parameter (Bulk Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Asbestos Identification Name	Type	N/A	ISO 17025	Amosite-Insulation Board/Tile				

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Analytical Report Number : 17-51178

Project / Site name: Rail Central

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Bulks	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	W	ISO 17025

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

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Analytical Report Number : 16-27564

Project / Site name:	Rail Centre	**Samples received on:**	09/09/2016
Your job number:	C151171	**Samples instructed on:**	12/09/2016
Your order number:	C151171-N9541	**Analysis completed by:**	19/09/2016
Report Issue Number:	1	**Report issued on:**	19/09/2016
Samples Analysed:	29 soil samples		

Signed:

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

Signed:

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

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

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

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

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

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Analytical Report Number: 16-27564

Project / Site name: Rail Centre

Your Order No: C151171-N9541

Lab Sample Number				628336	628337	628338	628339	628340
Sample Reference				TPL010	TPL011	TPT010	TPT019	TPT022
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	1.10	2.40	2.80	1.50
Date Sampled				07/09/2016	07/09/2016	31/08/2016	01/09/2016	31/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	6.0	11	17	20	17
Total mass of sample received	kg	0.001	NONE	0.95	1.0	0.99	0.88	0.92
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.2	11.4	7.8	7.5	8.0
Total Sulphate as SO_4	mg/kg	50	MCERTS	560	3100	4900	1600	1900
Total Sulphate as SO_4	%	0.005	MCERTS	0.056	0.312	0.486	0.162	0.189
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.14	0.13	1.7	0.80	0.49
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	136	125	1660	798	491
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	8.0	47	13	23	13
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	4.0	23	6.6	12	6.7
Total Sulphur	mg/kg	50	NONE	280	1300	3900	1200	4300
Total Sulphur	%	0.005	NONE	0.028	0.131	0.391	0.119	0.425
Ammonium as NH_4	mg/kg	0.5	MCERTS	< 0.5	< 0.5	< 0.5	14	< 0.5
Ammonium as NH_4 (leachate equivalent)	mg/l	0.05	MCERTS	< 0.1	< 0.1	< 0.1	6.7	< 0.1
Organic Matter	%	0.1	MCERTS	-	-	-	-	-
Water Soluble Nitrate (2:1) as NO_3	mg/kg	2	NONE	7.5	12	2.8	< 2.0	< 2.0
Water Soluble Nitrate (2:1) as NO_3 (leachate equivalent)	mg/l	5	NONE	< 5.0	6.2	< 5.0	< 5.0	< 5.0
Heavy Metals / Metalloids								
Magnesium (water soluble)	mg/kg	5	NONE	8.9	< 5.0	38	80	42
Magnesium (leachate equivalent)	mg/l	2.5	NONE	4.4	< 2.5	19	40	21

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Analytical Report Number: 16-27564

Project / Site name: Rail Centre

Your Order No: C151171-N9541

Lab Sample Number				628341	628342	628343	628344	628345
Sample Reference				TPT024	TPA002	TPA007	TPA008	TPA010
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.20	0.70	1.40	0.35	1.50
Date Sampled				31/08/2016	06/09/2016	22/08/2016	23/08/2016	23/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	19	15	16	15	15
Total mass of sample received	kg	0.001	NONE	1.1	1.0	1.2	1.2	1.0
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	-	7.5	8.3	7.6	8.1
Total Sulphate as SO_4	mg/kg	50	MCERTS	-	220	290	320	190
Total Sulphate as SO_4	%	0.005	MCERTS	-	0.022	0.029	0.032	0.019
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	0.023	0.031	0.046	0.032
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	23.0	31.4	46.0	31.5
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	-	< 1.0	12	11	12
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	-	< 0.5	6.0	5.7	5.9
Total Sulphur	mg/kg	50	NONE	-	120	140	200	110
Total Sulphur	%	0.005	NONE	-	0.012	0.014	0.020	0.011
Ammonium as NH_4	mg/kg	0.5	MCERTS	-	< 0.5	< 0.5	< 0.5	< 0.5
Ammonium as NH_4 (leachate equivalent)	mg/l	0.05	MCERTS	-	< 0.1	< 0.1	< 0.1	< 0.1
Organic Matter	%	0.1	MCERTS	1.1	-	-	-	-
Water Soluble Nitrate (2:1) as NO_3	mg/kg	2	NONE	-	7.4	13	6.0	10
Water Soluble Nitrate (2:1) as NO_3 (leachate equivalent)	mg/l	5	NONE	-	< 5.0	6.3	< 5.0	5.1
Heavy Metals / Metalloids								
Magnesium (water soluble)	mg/kg	5	NONE	-	< 5.0	5.8	5.2	< 5.0
Magnesium (leachate equivalent)	mg/l	2.5	NONE	-	< 2.5	2.9	2.6	< 2.5

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

Analytical Report Number: 16-27564

Project / Site name: Rail Centre

Your Order No: C151171-N9541

Lab Sample Number				628346	628347	628348	628349	628350
Sample Reference				TPA025	TPA025	TPR003	TPG026	TPG062
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.80	1.40	1.10	1.10	1.00
Date Sampled				04/09/2016	04/09/2016	26/08/2016	26/08/2016	25/08/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	27	32	14	15	15
Total mass of sample received	kg	0.001	NONE	1.1	1.2	1.0	0.95	0.99
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.9	-	8.2	8.0	7.7
Total Sulphate as SO_4	mg/kg	50	MCERTS	400	-	600	300	360
Total Sulphate as SO_4	%	0.005	MCERTS	0.040	-	0.060	0.030	0.036
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.064	-	0.12	0.12	0.11
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	64.2	-	120	124	113
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	24	-	12	24	17
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	12	-	5.8	12	8.4
Total Sulphur	mg/kg	50	NONE	220	-	280	190	220
Total Sulphur	%	0.005	NONE	0.022	-	0.028	0.019	0.022
Ammonium as NH_4	mg/kg	0.5	MCERTS	< 0.5	-	< 0.5	< 0.5	< 0.5
Ammonium as NH_4 (leachate equivalent)	mg/l	0.05	MCERTS	< 0.1	-	< 0.1	< 0.1	< 0.1
Organic Matter	%	0.1	MCERTS	-	9.2	-	-	-
Water Soluble Nitrate (2:1) as NO_3	mg/kg	2	NONE	3.1	-	2.1	< 2.0	21
Water Soluble Nitrate (2:1) as NO_3 (leachate equivalent)	mg/l	5	NONE	< 5.0	-	< 5.0	< 5.0	11
Heavy Metals / Metalloids								
Magnesium (water soluble)	mg/kg	5	NONE	5.7	-	8.6	23	24
Magnesium (leachate equivalent)	mg/l	2.5	NONE	2.9	-	4.3	11	12

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Analytical Report Number: 16-27564

Project / Site name: Rail Centre

Your Order No: C151171-N9541

Lab Sample Number				628351	628352	628353	628354	628355
Sample Reference				TPR010	TPG025	TPT008	TPR013	TPA012
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.80	2.30	1.60	2.70	1.80
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	18	17	18	18	17
Total mass of sample received	kg	0.001	NONE	1.0	1.0	1.0	1.1	1.1
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.4	7.4	8.0	8.0	8.0
Total Sulphate as SO_4	mg/kg	50	MCERTS	47000	67000	36000	21000	9500
Total Sulphate as SO_4	%	0.005	MCERTS	4.67	6.67	3.57	2.14	0.949
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	2.1	1.6	2.0	2.1	2.1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	2140	1580	2010	2060	2080
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	22	38	21	10	9.6
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	11	19	11	5.0	4.8
Total Sulphur	mg/kg	50	NONE	20000	30000	12000	7200	5000
Total Sulphur	%	0.005	NONE	1.98	2.97	1.22	0.717	0.500
Ammonium as NH_4	mg/kg	0.5	MCERTS	2.7	< 0.5	< 0.5	< 0.5	< 0.5
Ammonium as NH_4 (leachate equivalent)	mg/l	0.05	MCERTS	1.4	< 0.1	0.2	0.1	< 0.1
Organic Matter	%	0.1	MCERTS	-	-	-	-	-
Water Soluble Nitrate (2:1) as NO_3	mg/kg	2	NONE	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Water Soluble Nitrate (2:1) as NO_3 (leachate equivalent)	mg/l	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Heavy Metals / Metalloids								
Magnesium (water soluble)	mg/kg	5	NONE	340	110	260	340	430
Magnesium (leachate equivalent)	mg/l	2.5	NONE	170	56	130	170	220

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Analytical Report Number: 16-27564

Project / Site name: Rail Centre

Your Order No: C151171-N9541

Lab Sample Number				628356	628357	628358	628359	628360
Sample Reference				TPA008	TPG027	TPG056	TPG059	TPA006
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.70	2.80	0.70	2.00	2.90
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	18	18	14	10	13
Total mass of sample received	kg	0.001	NONE	0.92	1.0	1.2	0.98	0.98
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.7	8.0	7.7	8.3	7.9
Total Sulphate as SO_4	mg/kg	50	MCERTS	89000	4700	240	870	46000
Total Sulphate as SO_4	%	0.005	MCERTS	8.91	0.467	0.024	0.087	4.58
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	1.7	2.2	0.060	0.11	1.9
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	1730	2210	60.1	110	1920
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	10	15	7.2	10	7.6
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	5.1	7.6	3.6	5.0	3.8
Total Sulphur	mg/kg	50	NONE	36000	1600	1000	720	16000
Total Sulphur	%	0.005	NONE	3.59	0.164	0.103	0.072	1.57
Ammonium as NH_4	mg/kg	0.5	MCERTS	< 0.5	0.9	< 0.5	< 0.5	1.1
Ammonium as NH_4 (leachate equivalent)	mg/l	0.05	MCERTS	< 0.1	0.5	< 0.1	< 0.1	0.6
Organic Matter	%	0.1	MCERTS	-	-	-	-	-
Water Soluble Nitrate (2:1) as NO_3	mg/kg	2	NONE	3.6	< 2.0	2.9	< 2.0	< 2.0
Water Soluble Nitrate (2:1) as NO_3 (leachate equivalent)	mg/l	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Heavy Metals / Metalloids								
Magnesium (water soluble)	mg/kg	5	NONE	96	460	12	23	290
Magnesium (leachate equivalent)	mg/l	2.5	NONE	48	230	5.8	12	150

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Analytical Report Number: 16-27564

Project / Site name: Rail Centre

Your Order No: C151171-N9541

Lab Sample Number				628361	628362	628363	628364	
Sample Reference				TPR014	TPL006	TPL006	TPA025	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				2.60	1.20	2.20	2.60	
Date Sampled				Deviating	07/09/2016	07/09/2016	07/09/2016	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	19	17	26	17	
Total mass of sample received	kg	0.001	NONE	0.85	1.1	1.1	1.1	
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.2	8.3	8.0	8.0	
Total Sulphate as SO_4	mg/kg	50	MCERTS	3100	470	1100	1100	
Total Sulphate as SO_4	%	0.005	MCERTS	0.314	0.047	0.110	0.106	
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	1.6	0.024	0.042	0.51	
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	1600	24.1	42.1	509	
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	20	4.8	10	74	
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	9.9	2.4	5.1	37	
Total Sulphur	mg/kg	50	NONE	1200	290	760	15000	
Total Sulphur	%	0.005	NONE	0.124	0.029	0.076	1.54	
Ammonium as NH_4	mg/kg	0.5	MCERTS	1.4	< 0.5	< 0.5	< 0.5	
Ammonium as NH_4 (leachate equivalent)	mg/l	0.05	MCERTS	0.7	< 0.1	< 0.1	< 0.1	
Organic Matter	%	0.1	MCERTS	-	-	-	-	
Water Soluble Nitrate (2:1) as NO_3	mg/kg	2	NONE	2.7	< 2.0	5.0	2.1	
Water Soluble Nitrate (2:1) as NO_3 (leachate equivalent)	mg/l	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	
Heavy Metals / Metalloids								
Magnesium (water soluble)	mg/kg	5	NONE	370	< 5.0	< 5.0	55	
Magnesium (leachate equivalent)	mg/l	2.5	NONE	180	< 2.5	< 2.5	27	

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Analytical Report Number : 16-27564

Project / Site name: Rail Centre

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
628336	TPL010	None Supplied	0.50	Brown loam and sand with gravel and vegetation.
628337	TPL011	None Supplied	1.10	Brown loam and clay with gravel and rubble.
628338	TPT010	None Supplied	2.40	Light brown clay and sand.
628339	TPT019	None Supplied	2.80	Grey clay and sand.
628340	TPT022	None Supplied	1.50	Light brown clay and sand.
628341	TPT024	None Supplied	2.20	Grey clay and sand.
628342	TPA002	None Supplied	0.70	Brown clay and sand.
628343	TPA007	None Supplied	1.40	Light brown clay and sand.
628344	TPA008	None Supplied	0.35	Light brown clay and sand.
628345	TPA010	None Supplied	1.50	Light brown clay and sand.
628346	TPA025	None Supplied	0.80	Light brown clay and sand.
628347	TPA025	None Supplied	1.40	Grey loam and clay.
628348	TPR003	None Supplied	1.10	Light brown clay and sand.
628349	TPG026	None Supplied	1.10	Light brown clay and sand.
628350	TPG062	None Supplied	1.00	Light brown clay and sand.
628351	TPR010	None Supplied	2.80	Grey clay and sand.
628352	TPG025	None Supplied	2.30	Grey clay and sand.
628353	TPT008	None Supplied	1.60	Grey clay and sand.
628354	TPR013	None Supplied	2.70	Grey clay and sand.
628355	TPA012	None Supplied	1.80	Grey clay and sand.
628356	TPA008	None Supplied	1.70	Grey clay and sand.
628357	TPG027	None Supplied	2.80	Grey clay and sand.
628358	TPG056	None Supplied	0.70	Light brown clay and sand.
628359	TPG059	None Supplied	2.00	Brown clay and sand.
628360	TPA006	None Supplied	2.90	Grey clay and sand.
628361	TPR014	None Supplied	2.60	Grey clay and sand.
628362	TPL006	None Supplied	1.20	Light brown clay and sand.
628363	TPL006	None Supplied	2.20	Light brown clay and sand.
628364	TPA025	None Supplied	2.60	Grey clay and sand.

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Analytical Report Number : 16-27564

Project / Site name: Rail Centre

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonium as NH4 in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests. 2:1 extraction.	L082-PL	D	MCERTS
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES.	In-house method based on TRL 447	L038-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Nitrate, water soluble, in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction.	L078-PL	D	NONE
Organic matter in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	NONE
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	NONE

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

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Analytical Report Number : 16-29124

Project / Site name:	Rail Central	**Samples received on:**	27/09/2016
Your job number:	C151171	**Samples instructed on:**	03/10/2016
Your order number:	C151171-N9619	**Analysis completed by:**	07/10/2016
Report Issue Number:	1	**Report issued on:**	07/10/2016
Samples Analysed:	20 soil samples		

Signed: CCStone

Dr Claire Stone
Quality Manager
For & on behalf of i2 Analytical Ltd.

Signed:

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

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

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

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

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

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Analytical Report Number: 16-29124

Project / Site name: Rail Central
Your Order No: C151171-N9619

Lab Sample Number				637776	637777	637778	637779	637780
Sample Reference				TPG032	TPA027	TPG045	TPA015	TPA029
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	1.50	0.80	2.40	0.80
Date Sampled				20/09/2016	15/09/2016	16/09/2016	14/09/2016	14/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	15	9.8	18	31	27
Total mass of sample received	kg	0.001	NONE	1.1	1.1	1.1	1.2	1.2
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.5	7.1	8.1	6.3	7.5
Total Sulphate as SO_4	mg/kg	50	MCERTS	160	160	1400	810	400
Total Sulphate as SO_4	%	0.005	MCERTS	0.016	0.016	0.138	0.081	0.040
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0038	0.0073	0.056	0.30	0.026
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	3.8	7.3	55.5	298	25.8
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	5.5	12	5.4	13	33
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	2.7	6.0	2.7	6.3	17
Total Sulphur	mg/kg	50	NONE	55	61	560	4800	150
Total Sulphur	%	0.005	NONE	0.005	0.006	0.056	0.484	0.015
Ammonium as NH_4	mg/kg	0.5	MCERTS	0.6	0.6	0.8	6.0	0.7
Ammonium as NH_4 (leachate equivalent)	mg/l	0.05	MCERTS	0.3	0.3	0.4	3.0	0.4
Organic Matter	%	0.1	MCERTS	-	-	-	5.6	1.5
Water Soluble Nitrate (2:1) as NO_3	mg/kg	2	NONE	4.5	11	3.6	< 2.0	5.2
Water Soluble Nitrate (2:1) as NO_3 (leachate equivalent)	mg/l	5	NONE	< 5.0	5.7	< 5.0	< 5.0	< 5.0
Heavy Metals / Metalloids								
Magnesium (water soluble)	mg/kg	5	NONE	< 5.0	< 5.0	< 5.0	21	< 5.0
Magnesium (leachate equivalent)	mg/l	2.5	NONE	< 2.5	< 2.5	< 2.5	11	< 2.5

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Analytical Report Number: 16-29124

Project / Site name: Rail Central
Your Order No: C151171-N9619

Lab Sample Number				637781	637782	637783	637784	637785
Sample Reference				BHA013	TPA029	BHRT02	BHG018	BHG024
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	1.40	8.00	9.50	9.00
Date Sampled				20/09/2016	14/09/2016	09/09/2016	21/09/2016	05/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	24	34	12	15	15
Total mass of sample received	kg	0.001	NONE	1.1	1.2	1.1	1.2	1.1
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.6	6.8	8.0	7.7	8.1
Total Sulphate as SO_4	mg/kg	50	MCERTS	490	1000	3600	1900	1500
Total Sulphate as SO_4	%	0.005	MCERTS	0.049	0.102	0.363	0.193	0.146
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.060	0.15	1.7	0.96	0.66
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	59.8	154	1740	957	662
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	21	59	270	120	53
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	11	29	130	62	26
Total Sulphur	mg/kg	50	NONE	290	1400	7600	9200	2700
Total Sulphur	%	0.005	NONE	0.029	0.136	0.759	0.915	0.274
Ammonium as NH_4	mg/kg	0.5	MCERTS	0.6	2.7	6.4	1.1	4.3
Ammonium as NH_4 (leachate equivalent)	mg/l	0.05	MCERTS	0.3	1.3	3.2	0.5	2.2
Organic Matter	%	0.1	MCERTS	1.3	2.2	-	-	-
Water Soluble Nitrate (2:1) as NO_3	mg/kg	2	NONE	8.2	< 2.0	2.4	< 2.0	< 2.0
Water Soluble Nitrate (2:1) as NO_3 (leachate equivalent)	mg/l	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Heavy Metals / Metalloids								
Magnesium (water soluble)	mg/kg	5	NONE	22	10	230	50	130
Magnesium (leachate equivalent)	mg/l	2.5	NONE	11	5.0	120	25	63

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Analytical Report Number: 16-29124

Project / Site name: Rail Central
Your Order No: C151171-N9619

Lab Sample Number				637786	637787	637788	637789	637790
Sample Reference				BHG024	BHL010 Combined	TPA029	BHA014	TPG045
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				11.25	2.00-3.00	2.00	2.50	1.50
Date Sampled				05/09/2016	08/09/2016	14/09/2016	13/09/2016	16/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	15	9.8	28	11	17
Total mass of sample received	kg	0.001	NONE	1.0	2.0	1.0	1.1	1.0
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.9	8.1	7.8	7.2	8.2
Total Sulphate as SO_4	mg/kg	50	MCERTS	1900	260	530	250	530
Total Sulphate as SO_4	%	0.005	MCERTS	0.192	0.026	0.053	0.025	0.053
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.87	0.047	0.090	0.027	0.059
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	871	47.2	89.8	26.6	58.7
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	68	25	37	8.7	12
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	34	13	19	4.4	5.9
Total Sulphur	mg/kg	50	NONE	12000	130	430	99	260
Total Sulphur	%	0.005	NONE	1.20	0.013	0.043	0.010	0.026
Ammonium as NH_4	mg/kg	0.5	MCERTS	2.7	< 0.5	0.6	0.5	0.5
Ammonium as NH_4 (leachate equivalent)	mg/l	0.05	MCERTS	1.3	0.2	0.3	0.3	0.3
Organic Matter	%	0.1	MCERTS	-	-	-	-	-
Water Soluble Nitrate (2:1) as NO_3	mg/kg	2	NONE	< 2.0	24	< 2.0	7.7	4.9
Water Soluble Nitrate (2:1) as NO_3 (leachate equivalent)	mg/l	5	NONE	< 5.0	12	< 5.0	< 5.0	< 5.0
Heavy Metals / Metalloids								
Magnesium (water soluble)	mg/kg	5	NONE	110	< 5.0	6.8	5.6	7.4
Magnesium (leachate equivalent)	mg/l	2.5	NONE	57	< 2.5	3.4	2.8	3.7

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Analytical Report Number: 16-29124

Project / Site name: Rail Central
Your Order No: C151171-N9619

Lab Sample Number				637791	637792	637793	637794	637795
Sample Reference				BHA015	TPA018	BHA015	BHA015	BHA015
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.50	2.80	2.00	5.00	6.00
Date Sampled				12/09/2016	14/09/2016	12/09/2016	12/09/2016	12/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	14	17	20	13	12
Total mass of sample received	kg	0.001	NONE	1.1	1.0	1.1	1.1	1.1
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.9	7.9	7.7	7.8	8.6
Total Sulphate as SO_4	mg/kg	50	MCERTS	3700	3300	1900	2300	2100
Total Sulphate as SO_4	%	0.005	MCERTS	0.367	0.325	0.187	0.232	0.208
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	1.6	1.5	0.85	1.1	1.0
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	1640	1520	848	1120	1030
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	98	6.3	28	120	39
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	49	3.1	14	60	19
Total Sulphur	mg/kg	50	NONE	10000	1200	6200	11000	12000
Total Sulphur	%	0.005	NONE	1.04	0.119	0.615	1.11	1.21
Ammonium as NH_4	mg/kg	0.5	MCERTS	2.6	1.4	0.6	3.5	1.5
Ammonium as NH_4 (leachate equivalent)	mg/l	0.05	MCERTS	1.3	0.7	0.3	1.7	0.7
Organic Matter	%	0.1	MCERTS	-	-	-	-	-
Water Soluble Nitrate (2:1) as NO_3	mg/kg	2	NONE	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Water Soluble Nitrate (2:1) as NO_3 (leachate equivalent)	mg/l	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Heavy Metals / Metalloids								
Magnesium (water soluble)	mg/kg	5	NONE	74	250	37	99	80
Magnesium (leachate equivalent)	mg/l	2.5	NONE	37	120	18	50	40

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Analytical Report Number : 16-29124

Project / Site name: Rail Central

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
637776	TPG032	None Supplied	1.20	Light brown loam and sand.
637777	TPA027	None Supplied	1.50	Light brown loam and sand.
637778	TPG045	None Supplied	0.80	Light brown loam and sand.
637779	TPA015	None Supplied	2.40	Brown clay and sand.
637780	TPA029	None Supplied	0.80	Light brown clay and sand.
637781	BHA013	None Supplied	1.20	Light brown clay and sand.
637782	TPA029	None Supplied	1.40	Brown clay and sand.
637783	BHRT02	None Supplied	8.00	Grey clay and sand.
637784	BHG018	None Supplied	9.50	Grey clay and sand.
637785	BHG024	None Supplied	9.00	Grey clay and sand.
637786	BHG024	None Supplied	11.25	Grey clay and sand.
637787	BHL010 Combined	None Supplied	2.00-3.00	Brown sandy clay.
637788	TPA029	None Supplied	2.00	Brown clay and sand.
637789	BHA014	None Supplied	2.50	Brown clay and sand.
637790	TPG045	None Supplied	1.50	Brown clay and sand.
637791	BHA015	None Supplied	2.50	Grey clay and sand.
637792	TPA018	None Supplied	2.80	Grey clay and sand.
637793	BHA015	None Supplied	2.00	Grey clay.
637794	BHA015	None Supplied	5.00	Grey clay.
637795	BHA015	None Supplied	6.00	Grey clay.

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Analytical Report Number : 16-29124

Project / Site name: Rail Central

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonium as NH4 in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests. 2:1 extraction.	L082-PL	D	MCERTS
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES.	In-house method based on TRL 447	L038-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Nitrate, water soluble, in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction.	L078-PL	D	NONE
Organic matter in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	NONE
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L038	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	NONE

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

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Analytical Report Number : 16-29798

Project / Site name:	Rail Central	**Samples received on:**	07/10/2016
Your job number:	C151171	**Samples instructed on:**	10/10/2016
Your order number:	POP000104	**Analysis completed by:**	17/10/2016
Report Issue Number:	1	**Report issued on:**	17/10/2016
Samples Analysed:	6 soil samples		

Signed: 

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

Signed: 

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

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

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

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

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

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Analytical Report Number: 16-29798

Project / Site name: Rail Central
Your Order No: POP000104

Lab Sample Number				641692	641693	641694	641695	641696
Sample Reference				TPG010	TPR012	TPG029	TPG044	TPG037
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				2.50-2.60	0.50-0.60	1.30-1.50	1.20-1.60	1.00-1.20
Date Sampled				29/09/2016	30/09/2016	27/09/2016	26/09/2016	27/09/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	18	17	6.6	8.9	39
Total mass of sample received	kg	0.001	NONE	0.78	0.69	0.68	0.71	0.72
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.8	7.3	7.0	6.7	6.6
Total Sulphate as SO_4	mg/kg	50	MCERTS	5100	400	170	180	530
Total Sulphate as SO_4	%	0.005	MCERTS	0.505	0.040	0.017	0.018	0.053
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	2.4	0.026	0.014	0.023	0.13
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	2350	25.8	14.2	23.0	127
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	28	26	20	29	13
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	14	13	9.8	14	6.5
Total Sulphur	mg/kg	50	NONE	1800	170	65	83	610
Total Sulphur	%	0.005	NONE	0.177	0.017	0.006	0.008	0.061
Ammonium as NH_4	mg/kg	0.5	MCERTS	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ammonium as NH_4 (leachate equivalent)	mg/l	0.05	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Organic Matter	%	0.1	MCERTS	-	-	-	-	2.2
Water Soluble Nitrate (2:1) as NO_3	mg/kg	2	NONE	< 2.0	4.5	23	24	< 2.0
Water Soluble Nitrate (2:1) as NO_3 (leachate equivalent)	mg/l	5	NONE	< 5.0	< 5.0	12	12	< 5.0
Heavy Metals / Metalloids								
Magnesium (water soluble)	mg/kg	5	NONE	340	7.3	< 5.0	< 5.0	18
Magnesium (leachate equivalent)	mg/l	2.5	NONE	170	3.7	< 2.5	< 2.5	9.0

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Analytical Report Number: 16-29798

Project / Site name: Rail Central
Your Order No: POP000104

Lab Sample Number				641697				
Sample Reference				TPA047				
Sample Number				None Supplied				
Depth (m)				0.40-0.90				
Date Sampled				26/09/2016				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	17				
Total mass of sample received	kg	0.001	NONE	0.63				
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.7				
Total Sulphate as SO_4	mg/kg	50	MCERTS	250				
Total Sulphate as SO_4	%	0.005	MCERTS	0.025				
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.041				
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	41.3				
Water Soluble Chloride (2:1)	mg/kg	1	MCERTS	35				
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	18				
Total Sulphur	mg/kg	50	NONE	140				
Total Sulphur	%	0.005	NONE	0.014				
Ammonium as NH_4	mg/kg	0.5	MCERTS	< 0.5				
Ammonium as NH_4 (leachate equivalent)	mg/l	0.05	MCERTS	< 0.1				
Organic Matter	%	0.1	MCERTS	-				
Water Soluble Nitrate (2:1) as NO_3	mg/kg	2	NONE	5.9				
Water Soluble Nitrate (2:1) as NO_3 (leachate equivalent)	mg/l	5	NONE	< 5.0				
Heavy Metals / Metalloids								
Magnesium (water soluble)	mg/kg	5	NONE	< 5.0				
Magnesium (leachate equivalent)	mg/l	2.5	NONE	< 2.5				

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Analytical Report Number : 16-29798

Project / Site name: Rail Central

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
641692	TPG010	None Supplied	2.50-2.60	Grey clay and sand.
641693	TPR012	None Supplied	0.50-0.60	Light brown clay and sand.
641694	TPG029	None Supplied	1.30-1.50	Light brown sandy clay.
641695	TPG044	None Supplied	1.20-1.60	Light brown sandy clay.
641696	TPG037	None Supplied	1.00-1.20	Grey clay and sand.
641697	TPA047	None Supplied	0.40-0.90	Light brown clay and loam.

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Analytical Report Number : 16-29798

Project / Site name: Rail Central

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonium as NH4 in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests. 2:1 extraction.	L082-PL	D	MCERTS
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES.	In-house method based on TRL 447	L038-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Nitrate, water soluble, in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction.	L078-PL	D	NONE
Organic matter in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	NONE
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L038	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	NONE

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

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Analytical Report Number : 16-30349

Project / Site name:	Rail Central, Milton Malsor	**Samples received on:**	17/10/2016
Your job number:	C151171	**Samples instructed on:**	17/10/2016
Your order number:	POP 000268	**Analysis completed by:**	24/10/2016
Report Issue Number:	1	**Report issued on:**	24/10/2016
Samples Analysed:	19 water samples		

Signed:

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

Signed:

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

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

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

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

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

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

Analytical Report Number: 16-30349

Project / Site name: Rail Central, Milton Malsor

Your Order No: POP 000268

Lab Sample Number				644883	644884	644885	644886	644887
Sample Reference				BH G009	BH G019	BH G001	BH R004	BH G017
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				13/10/2016	13/10/2016	13/10/2016	13/10/2016	13/10/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.7	7.5	7.2	7.4	7.7
Electrical Conductivity	µS/cm	10	NONE	480	670	2100	6100	490
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Free Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Sulphate as SO_4	µg/l	45	ISO 17025	43200	121000	1060000	3450000	48400
Chloride	mg/l	0.15	ISO 17025	8.5	25	36	600	16
Fluoride	µg/l	50	ISO 17025	160	220	220	210	190
Ammonium as NH_4	µg/l	15	ISO 17025	30	84	1100	68	35
Nitrate as N	mg/l	0.01	ISO 17025	7.12	0.47	0.80	2.44	6.17
Nitrate as NO_3	mg/l	0.05	ISO 17025	31.5	2.08	3.54	10.8	27.3
Nitrite as N	µg/l	1	ISO 17025	26	16	18	66	43
Nitrite as NO_2	µg/l	5	ISO 17025	85	53	59	220	140
Hardness - Total	mgCaCO3/l	1	ISO 17025	249	338	1350	3080	237
Bromate by IC	mg/l	0.002	NONE	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Total Phenols								
Total Phenols	µg/l	0.5	NONE	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(ghi)perylene	µg/l	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PAH Sums								
Sum of Benzo(b)fluoranthene & Benzo(k)fluoranthene	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Sum of Benzo(ghi)fluoranthene & Indeno(1,2,3-cd)pyrene	µg/l	0.002	NONE	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Sum of Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(ghi)fluoranthene & Indeno(1,2,3-cd)pyrene	µg/l	0.022	NONE	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02

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Analytical Report Number: 16-30349

Project / Site name: Rail Central, Milton Malsor

Your Order No: POP 000268

Lab Sample Number				644883	644884	644885	644886	644887
Sample Reference				BH G009	BH G019	BH G001	BH R004	BH G017
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				13/10/2016	13/10/2016	13/10/2016	13/10/2016	13/10/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Zinc (total)	µg/l	0.5	ISO 17025	120	26	34	41	78
Aluminium (dissolved)	mg/l	0.001	ISO 17025	0.0082	0.0112	0.0060	0.0054	0.0032
Antimony (dissolved)	µg/l	0.4	ISO 17025	0.4	< 0.4	0.7	< 0.4	< 0.4
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.28	0.78	0.27	0.51	0.24
Barium (dissolved)	µg/l	0.06	ISO 17025	34	81	47	46	75
Boron (dissolved)	µg/l	10	ISO 17025	58	46	260	1400	26
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	< 0.02	0.03	< 0.02	0.03
Calcium (dissolved)	mg/l	0.012	ISO 17025	91	120	440	510	82
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chromium (III)	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.5	0.2	< 0.2	0.7	< 0.2
Cobalt (dissolved)	µg/l	0.2	ISO 17025	< 0.2	0.8	1.3	< 0.2	0.3
Copper (dissolved)	µg/l	0.5	ISO 17025	1.3	0.6	0.8	4.8	< 0.5
Iron (dissolved)	mg/l	0.004	ISO 17025	0.006	0.009	0.014	1.0	0.006
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Magnesium (dissolved)	mg/l	0.005	ISO 17025	5.2	8.2	59	440	7.7
Manganese (dissolved)	µg/l	0.05	ISO 17025	5.2	13	680	8.2	430
Mercury (dissolved) CV-AFS	µg/l	0.005	NONE	< 0.005	< 0.005	< 0.005	0.012	0.021
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	0.69	1.0	1.9	1.2	0.67
Nickel (dissolved)	µg/l	0.5	ISO 17025	2.1	4.8	6.1	3.7	0.7
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Silver (dissolved)	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Sodium (dissolved)	mg/l	0.01	ISO 17025	5.6	13	16	480	8.2
Tin (dissolved)	µg/l	0.2	ISO 17025	< 0.20	0.45	0.25	< 0.20	< 0.20
Vanadium (dissolved)	µg/l	0.2	ISO 17025	0.2	< 0.2	< 0.2	0.2	0.2
Zinc (dissolved)	µg/l	0.5	ISO 17025	3.1	< 0.5	1.3	5.6	1.8
Monoaromatics								
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	-	-
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	-	-
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	-	-
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	-	-
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	-	-
Petroleum Hydrocarbons								
TPH (C35 - C44)	µg/l	10	NONE	< 10	< 10	< 10	-	-
TPH (C5 - C6)	µg/l	10	NONE	< 10	< 10	< 10	-	-
TPH (C6 - C7)	µg/l	10	NONE	< 10	< 10	< 10	-	-
TPH (C7 - C8)	µg/l	10	NONE	< 10	< 10	< 10	-	-
TPH (C8 - C10)	µg/l	10	NONE	< 10	< 10	< 10	-	-
TPH (C10 - C12)	µg/l	10	NONE	< 10	< 10	< 10	-	-
TPH (C12 - C16)	µg/l	10	NONE	< 10	< 10	< 10	-	-
TPH (C16 - C21)	µg/l	10	NONE	< 10	< 10	< 10	-	-
TPH (C21 - C35)	µg/l	10	NONE	< 10	< 10	< 10	-	-
Pesticides/Herbicides Screen								
Pesticides/Herbicides Screen in Water	P/A	N/A	NONE	-	-	-	Absent	Absent

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number: 16-30349

Project / Site name: Rail Central, Milton Malsor

Your Order No: POP 000268

Lab Sample Number				644888	644889	644890	644891	644892
Sample Reference				BH G016	BH G007	BH G024	BH G014	BH G006
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				13/10/2016	13/10/2016	13/10/2016	13/10/2016	13/10/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	8.1	7.4	6.9	7.3	7.2
Electrical Conductivity	µS/cm	10	NONE	700	4300	3400	5700	4800
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Free Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Sulphate as SO_4	µg/l	45	ISO 17025	105000	2810000	2030000	3240000	2530000
Chloride	mg/l	0.15	ISO 17025	24	86	82	460	470
Fluoride	µg/l	50	ISO 17025	300	230	190	190	200
Ammonium as NH_4	µg/l	15	ISO 17025	19	130	95	2100	790
Nitrate as N	mg/l	0.01	ISO 17025	29.2	3.09	0.27	4.51	2.92
Nitrate as NO_3	mg/l	0.05	ISO 17025	130	13.7	1.20	20.0	13.0
Nitrite as N	µg/l	1	ISO 17025	16	860	24	750	530
Nitrite as NO_2	µg/l	5	ISO 17025	53	2800	79	2500	1700
Hardness - Total	mgCaCO3/l	1	ISO 17025	326	2630	1880	2520	2660
Bromate by IC	mg/l	0.002	NONE	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Total Phenols								
Total Phenols	µg/l	0.5	NONE	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(ghi)perylene	µg/l	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PAH Sums								
Sum of Benzo(b)fluoranthene & Benzo(k)fluoranthene	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Sum of Benzo(ghi)fluoranthene & Indeno(1,2,3-cd)pyrene	µg/l	0.002	NONE	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Sum of Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(ghi)fluoranthene & Indeno(1,2,3-cd)pyrene	µg/l	0.022	NONE	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02

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Analytical Report Number: 16-30349

Project / Site name: Rail Central, Milton Malsor

Your Order No: POP 000268

Lab Sample Number				644888	644889	644890	644891	644892
Sample Reference				BH G016	BH G007	BH G024	BH G014	BH G006
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				13/10/2016	13/10/2016	13/10/2016	13/10/2016	13/10/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Zinc (total)	µg/l	0.5	ISO 17025	54	49	51	51	57
Aluminium (dissolved)	mg/l	0.001	ISO 17025	0.0589	0.0081	0.0070	0.0071	0.0023
Antimony (dissolved)	µg/l	0.4	ISO 17025	0.9	0.5	0.6	0.8	0.9
Arsenic (dissolved)	µg/l	0.15	ISO 17025	1.27	0.31	1.30	< 0.15	0.25
Barium (dissolved)	µg/l	0.06	ISO 17025	32	56	76	56	81
Boron (dissolved)	µg/l	10	ISO 17025	40	2000	690	2400	2200
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	< 0.02	0.04	< 0.02	0.06
Calcium (dissolved)	mg/l	0.012	ISO 17025	99	410	500	470	510
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chromium (III)	µg/l	1	NONE	6.4	< 1.0	< 1.0	< 1.0	< 1.0
Chromium (dissolved)	µg/l	0.2	ISO 17025	6.4	< 0.2	0.2	< 0.2	< 0.2
Cobalt (dissolved)	µg/l	0.2	ISO 17025	0.5	< 0.2	0.2	0.4	3.9
Copper (dissolved)	µg/l	0.5	ISO 17025	< 0.5	0.7	2.0	4.4	0.9
Iron (dissolved)	mg/l	0.004	ISO 17025	0.006	0.028	0.056	0.007	0.004
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Magnesium (dissolved)	mg/l	0.005	ISO 17025	19	390	150	330	340
Manganese (dissolved)	µg/l	0.05	ISO 17025	110	12	150	110	260
Mercury (dissolved) CV-AFS	µg/l	0.005	NONE	< 0.005	< 0.005	0.010	0.009	< 0.005
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	3.6	1.5	1.2	1.1	1.1
Nickel (dissolved)	µg/l	0.5	ISO 17025	1.6	10	19	17	25
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6	2.7	4.4	2.2	1.0
Silver (dissolved)	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Sodium (dissolved)	mg/l	0.01	ISO 17025	15	190	150	560	220
Tin (dissolved)	µg/l	0.2	ISO 17025	< 0.20	0.23	< 0.20	< 0.20	< 0.20
Vanadium (dissolved)	µg/l	0.2	ISO 17025	2.8	< 0.2	< 0.2	< 0.2	< 0.2
Zinc (dissolved)	µg/l	0.5	ISO 17025	< 0.5	6.7	2.9	14	15
Monoaromatics								
Benzene	µg/l	1	ISO 17025	-	-	-	-	-
Toluene	µg/l	1	ISO 17025	-	-	-	-	-
Ethylbenzene	µg/l	1	ISO 17025	-	-	-	-	-
p & m-xylene	µg/l	1	ISO 17025	-	-	-	-	-
o-xylene	µg/l	1	ISO 17025	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	-	-	-	-	-
Petroleum Hydrocarbons								
TPH (C35 - C44)	µg/l	10	NONE	-	-	-	-	-
TPH (C5 - C6)	µg/l	10	NONE	-	-	-	-	-
TPH (C6 - C7)	µg/l	10	NONE	-	-	-	-	-
TPH (C7 - C8)	µg/l	10	NONE	-	-	-	-	-
TPH (C8 - C10)	µg/l	10	NONE	-	-	-	-	-
TPH (C10 - C12)	µg/l	10	NONE	-	-	-	-	-
TPH (C12 - C16)	µg/l	10	NONE	-	-	-	-	-
TPH (C16 - C21)	µg/l	10	NONE	-	-	-	-	-
TPH (C21 - C35)	µg/l	10	NONE	-	-	-	-	-
Pesticides/Herbicides Screen								
Pesticides/Herbicides Screen in Water	P/A	N/A	NONE	-	-	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number: 16-30349

Project / Site name: Rail Central, Milton Malsor

Your Order No: POP 000268

Lab Sample Number				644893	644894	644895	644896	644897
Sample Reference				BH R001s	BH R001d	BH RT002	BH RT001	BH A005
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				13/10/2016	13/10/2016	13/10/2016	13/10/2016	13/10/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.3	7.5	7.5	7.3	9.1
Electrical Conductivity	µS/cm	10	NONE	1700	2900	4200	2700	760
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Free Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Sulphate as SO_4	µg/l	45	ISO 17025	745000	1740000	2530000	1300000	255000
Chloride	mg/l	0.15	ISO 17025	25	74	130	82	48
Fluoride	µg/l	50	ISO 17025	280	230	260	270	770
Ammonium as NH_4	µg/l	15	ISO 17025	180	390	1500	1800	130
Nitrate as N	mg/l	0.01	ISO 17025	2.45	2.54	1.64	0.78	0.68
Nitrate as NO_3	mg/l	0.05	ISO 17025	10.9	11.2	7.28	3.43	3.02
Nitrite as N	µg/l	1	ISO 17025	18	20	720	110	18
Nitrite as NO_2	µg/l	5	ISO 17025	59	66	2300	350	59
Hardness - Total	mgCaCO3/l	1	ISO 17025	938	1730	1730	1090	194
Bromate by IC	mg/l	0.002	NONE	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Total Phenols								
Total Phenols	µg/l	0.5	NONE	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(ghi)perylene	µg/l	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PAH Sums								
Sum of Benzo(b)fluoranthene & Benzo(k)fluoranthene	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Sum of Benzo(ghi)fluoranthene & Indeno(1,2,3-cd)pyrene	µg/l	0.002	NONE	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Sum of Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(ghi)fluoranthene & Indeno(1,2,3-cd)pyrene	µg/l	0.022	NONE	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02

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Analytical Report Number: 16-30349

Project / Site name: Rail Central, Milton Malsor

Your Order No: POP 000268

Lab Sample Number				644893	644894	644895	644896	644897
Sample Reference				BH R001s	BH R001d	BH RT002	BH RT001	BH A005
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				13/10/2016	13/10/2016	13/10/2016	13/10/2016	13/10/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Zinc (total)	µg/l	0.5	ISO 17025	81	43	110	77	82
Aluminium (dissolved)	mg/l	0.001	ISO 17025	0.0073	0.0067	0.0073	0.0032	0.620
Antimony (dissolved)	µg/l	0.4	ISO 17025	1.1	0.5	1.0	0.4	1.2
Arsenic (dissolved)	µg/l	0.15	ISO 17025	3.92	0.19	0.30	0.86	2.71
Barium (dissolved)	µg/l	0.06	ISO 17025	59	58	63	50	24
Boron (dissolved)	µg/l	10	ISO 17025	230	620	2200	1200	110
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	0.02	0.02	< 0.02	< 0.02
Calcium (dissolved)	mg/l	0.012	ISO 17025	270	370	340	200	73
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chromium (III)	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	1.3
Chromium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	0.3	< 0.2	1.3
Cobalt (dissolved)	µg/l	0.2	ISO 17025	2.5	< 0.2	0.3	2.2	0.5
Copper (dissolved)	µg/l	0.5	ISO 17025	< 0.5	0.8	3.6	2.3	1.8
Iron (dissolved)	mg/l	0.004	ISO 17025	0.15	0.014	0.006	0.022	1.7
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	0.9
Magnesium (dissolved)	mg/l	0.005	ISO 17025	65	190	210	140	3.1
Manganese (dissolved)	µg/l	0.05	ISO 17025	1500	120	130	650	36
Mercury (dissolved) CV-AFS	µg/l	0.005	NONE	< 0.005	0.005	0.020	0.013	0.011
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	3.0	3.4	3.7	4.0	9.7
Nickel (dissolved)	µg/l	0.5	ISO 17025	5.0	8.7	11	8.5	2.5
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6	2.9	< 0.6	< 0.6	8.2
Silver (dissolved)	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Sodium (dissolved)	mg/l	0.01	ISO 17025	47	86	450	220	77
Tin (dissolved)	µg/l	0.2	ISO 17025	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Vanadium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	0.2	7.4
Zinc (dissolved)	µg/l	0.5	ISO 17025	1.0	5.0	19	1.0	3.4
Monoaromatics								
Benzene	µg/l	1	ISO 17025	-	-	-	-	-
Toluene	µg/l	1	ISO 17025	-	-	-	-	-
Ethylbenzene	µg/l	1	ISO 17025	-	-	-	-	-
p & m-xylene	µg/l	1	ISO 17025	-	-	-	-	-
o-xylene	µg/l	1	ISO 17025	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	-	-	-	-	-
Petroleum Hydrocarbons								
TPH (C35 - C44)	µg/l	10	NONE	-	-	-	-	-
TPH (C5 - C6)	µg/l	10	NONE	-	-	-	-	-
TPH (C6 - C7)	µg/l	10	NONE	-	-	-	-	-
TPH (C7 - C8)	µg/l	10	NONE	-	-	-	-	-
TPH (C8 - C10)	µg/l	10	NONE	-	-	-	-	-
TPH (C10 - C12)	µg/l	10	NONE	-	-	-	-	-
TPH (C12 - C16)	µg/l	10	NONE	-	-	-	-	-
TPH (C16 - C21)	µg/l	10	NONE	-	-	-	-	-
TPH (C21 - C35)	µg/l	10	NONE	-	-	-	-	-
Pesticides/Herbicides Screen								
Pesticides/Herbicides Screen in Water	P/A	N/A	NONE	-	-	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample

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

Analytical Report Number: 16-30349

Project / Site name: Rail Central, Milton Malsor

Your Order No: POP 000268

Lab Sample Number				644898	644899	644900	644901	
Sample Reference				BH A004	BH A003	BH A001	BH A002	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	
Date Sampled				13/10/2016	13/10/2016	13/10/2016	13/10/2016	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.3	7.5	7.6	7.5	
Electrical Conductivity	µS/cm	10	NONE	2500	790	770	2500	
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	
Free Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	
Sulphate as SO_4	µg/l	45	ISO 17025	1500000	207000	141000	1510000	
Chloride	mg/l	0.15	ISO 17025	27	38	14	32	
Fluoride	µg/l	50	ISO 17025	320	330	310	300	
Ammonium as NH_4	µg/l	15	ISO 17025	120	91	47	94	
Nitrate as N	mg/l	0.01	ISO 17025	0.40	0.40	19.4	17.5	
Nitrate as NO_3	mg/l	0.05	ISO 17025	1.77	1.77	85.8	77.5	
Nitrite as N	µg/l	1	ISO 17025	12	29	11	180	
Nitrite as NO_2	µg/l	5	ISO 17025	39	95	36	590	
Hardness - Total	mgCaCO3/l	1	ISO 17025	1260	373	378	1270	
Bromate by IC	mg/l	0.002	NONE	< 0.002	< 0.002	< 0.002	< 0.002	
Total Phenols								
Total Phenols	µg/l	0.5	NONE	< 0.50	< 0.50	< 0.50	< 0.50	
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Indeno(1,2,3-cd)pyrene	µg/l	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	
Benzo(ghi)perylene	µg/l	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	
PAH Sums								
Sum of Benzo(b)fluoranthene & Benzo(k)fluoranthene	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	
Sum of Benzo(ghi)fluoranthene & Indeno(1,2,3-cd)pyrene	µg/l	0.002	NONE	< 0.002	< 0.002	< 0.002	< 0.002	
Sum of Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(ghi)fluoranthene & Indeno(1,2,3-cd)pyrene	µg/l	0.022	NONE	< 0.02	< 0.02	< 0.02	< 0.02	

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Analytical Report Number: 16-30349

Project / Site name: Rail Central, Milton Malsor

Your Order No: POP 000268

Lab Sample Number				644898	644899	644900	644901	
Sample Reference				BH A004	BH A003	BH A001	BH A002	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	
Date Sampled				13/10/2016	13/10/2016	13/10/2016	13/10/2016	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Zinc (total)	µg/l	0.5	ISO 17025	40	40	21	91	
Aluminium (dissolved)	mg/l	0.001	ISO 17025	0.0805	0.0037	0.0016	< 0.0010	
Antimony (dissolved)	µg/l	0.4	ISO 17025	0.8	< 0.4	< 0.4	0.5	
Arsenic (dissolved)	µg/l	0.15	ISO 17025	1.18	0.45	0.33	0.76	
Barium (dissolved)	µg/l	0.06	ISO 17025	51	25	18	43	
Boron (dissolved)	µg/l	10	ISO 17025	220	340	60	140	
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.08	< 0.02	< 0.02	< 0.02	
Calcium (dissolved)	mg/l	0.012	ISO 17025	390	110	130	430	
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	
Chromium (III)	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.3	< 0.2	< 0.2	< 0.2	
Cobalt (dissolved)	µg/l	0.2	ISO 17025	6.3	1.5	< 0.2	6.4	
Copper (dissolved)	µg/l	0.5	ISO 17025	0.7	< 0.5	< 0.5	0.5	
Iron (dissolved)	mg/l	0.004	ISO 17025	0.033	0.008	0.005	< 0.004	
Lead (dissolved)	µg/l	0.2	ISO 17025	0.2	< 0.2	< 0.2	< 0.2	
Magnesium (dissolved)	mg/l	0.005	ISO 17025	72	22	11	50	
Manganese (dissolved)	µg/l	0.05	ISO 17025	2900	150	1.3	560	
Mercury (dissolved) CV-AFS	µg/l	0.005	NONE	< 0.005	< 0.005	< 0.005	< 0.005	
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	1.1	0.69	0.25	0.72	
Nickel (dissolved)	µg/l	0.5	ISO 17025	13	2.6	0.7	9.4	
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6	< 0.6	< 0.6	20	
Silver (dissolved)	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	
Sodium (dissolved)	mg/l	0.01	ISO 17025	93	64	8.1	97	
Tin (dissolved)	µg/l	0.2	ISO 17025	< 0.20	< 0.20	< 0.20	< 0.20	
Vanadium (dissolved)	µg/l	0.2	ISO 17025	0.4	0.3	< 0.2	< 0.2	
Zinc (dissolved)	µg/l	0.5	ISO 17025	2.7	1.9	< 0.5	2.9	
Monoaromatics								
Benzene	µg/l	1	ISO 17025	-	-	-	-	
Toluene	µg/l	1	ISO 17025	-	-	-	-	
Ethylbenzene	µg/l	1	ISO 17025	-	-	-	-	
p & m-xylene	µg/l	1	ISO 17025	-	-	-	-	
o-xylene	µg/l	1	ISO 17025	-	-	-	-	
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	-	-	-	-	
Petroleum Hydrocarbons								
TPH (C35 - C44)	µg/l	10	NONE	-	-	-	-	
TPH (C5 - C6)	µg/l	10	NONE	-	-	-	-	
TPH (C6 - C7)	µg/l	10	NONE	-	-	-	-	
TPH (C7 - C8)	µg/l	10	NONE	-	-	-	-	
TPH (C8 - C10)	µg/l	10	NONE	-	-	-	-	
TPH (C10 - C12)	µg/l	10	NONE	-	-	-	-	
TPH (C12 - C16)	µg/l	10	NONE	-	-	-	-	
TPH (C16 - C21)	µg/l	10	NONE	-	-	-	-	
TPH (C21 - C35)	µg/l	10	NONE	-	-	-	-	
Pesticides/Herbicides Screen								
Pesticides/Herbicides Screen in Water	P/A	N/A	NONE	-	-	-	-	

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number : 16-30349

Project / Site name: Rail Central, Milton Malsor

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonium as NH4 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Bromate in Water	Determination of bromate in waters based on ion chromatography	Inhouse method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	NONE
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Chloride in water	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025
Cr (III) in water	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Electrical conductivity at 20oC of water	Determination of electrical conductivity in water by electrometric measurement.	In-house method	L031-PL	W	NONE
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW, PW, GW.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033-PL	W	ISO 17025
Free cyanide in water	Determination of free cyanide by distillation followed by colorimetry.Accredited matrices SW, GW, PW.	In-house method	L080-PL	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Mercury Low Level (Dissolved) in Water	Mercury in water by millennium merlin AFS analyser	In-house method based on USEPA method 1631	L085-PL	W	NONE
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
Nitrite as N in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry). Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrite in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry).Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025

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Analytical Report Number : 16-30349

Project / Site name: Rail Central, Milton Malsor

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Pesticides and Herbicides in water screening	In-house method	In-house method		W	NONE
pH at 20oC in water (automated)	Determination of pH in water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	ISO 17025
Phenols, speciated, in water, by GCMS	Determination of speciated phenols in water by extraction in hexane followed by GC-MS.	In-house method based on USEPA 8270	L070-PL	W	NONE
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L0102B-PL	W	ISO 17025
Speciated EPA-16 PAHs in water (LOW LEVEL Dets)	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L070-PL	W	NONE
Specific PAH sums in water	Determination of PAH compounds in water by extraction in hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L070-PL	W	NONE
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium. Accredited Matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045-PL	W	ISO 17025
TPH 8 Band (Water)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In house method	L070-PL	W	NONE
TPH Chromatogram	TPH Chromatogram.	In-house method	L070-PL	W	NONE
TPH in (Water)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding.	L070-PL	W	NONE

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

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

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Analytical Report Number : 16-33292

Project / Site name:	Rail Central, Miltom Malsor	**Samples received on:**	18/11/2016
Your job number:	C 151171	**Samples instructed on:**	18/11/2016
Your order number:	POP 001827	**Analysis completed by:**	25/11/2016
Report Issue Number:	1	**Report issued on:**	25/11/2016
Samples Analysed:	12 water samples		

Signed: 

Dr Claire Stone
Quality Manager
For & on behalf of i2 Analytical Ltd.

Signed: 

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

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

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

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

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

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

Analytical Report Number: 16-33292

Project / Site name: Rail Central, Miltom Malsor

Your Order No: POP 001827

Lab Sample Number				660857	660858	660859	660860	660861
Sample Reference				BH A013	BH G012	BH G010	BH A015	BH L009
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				17/11/2016	17/11/2016	17/11/2016	17/11/2016	17/11/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.3	7.5	7.4	7.3	7.1
Electrical Conductivity	µS/cm	10	NONE	2100	540	1200	720	1800
Total Cyanide	µg/l	10	ISO 17025	47	< 10	< 10	< 10	< 10
Free Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Sulphate as SO_4	µg/l	45	ISO 17025	1540000	29900	476000	110000	949000
Chloride	mg/l	0.15	ISO 17025	26	26	49	30	65
Fluoride	µg/l	50	ISO 17025	290	390	310	300	330
Ammonium as NH_4	µg/l	15	ISO 17025	< 15	< 15	85	69	720
Nitrate as N	mg/l	0.01	ISO 17025	2.16	0.17	16.7	0.53	0.27
Nitrate as NO_3	mg/l	0.05	ISO 17025	9.57	0.74	73.7	2.33	1.22
Nitrite as N	µg/l	1	ISO 17025	74	120	120	21	< 1.0
Nitrite as NO_2	µg/l	5	ISO 17025	240	380	380	68	< 5.0
Hardness - Total	mgCaCO3/l	1	ISO 17025	1480	271	686	404	1460
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Total Phenols								
Total Phenols	µg/l	0.5	NONE	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	2.84
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	0.28
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	0.79
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	0.12
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	0.07
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	0.10
Indeno(1,2,3-cd)pyrene	µg/l	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(ghi)perylene	µg/l	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PAH Sums								
Sum of Benzo(b)fluoranthene & Benzo(k)fluoranthene	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	0.19
Sum of Benzo(ghi)fluoranthene & Indeno(1,2,3-cd)pyrene	µg/l	0.002	NONE	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Sum of Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(ghi)fluoranthene & Indeno(1,2,3-cd)pyrene	µg/l	0.022	NONE	< 0.02	< 0.02	< 0.02	< 0.02	0.19

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Analytical Report Number: 16-33292

Project / Site name: Rail Central, Miltom Malsor

Your Order No: POP 001827

Lab Sample Number				660857	660858	660859	660860	660861
Sample Reference				BH A013	BH G012	BH G010	BH A015	BH L009
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				17/11/2016	17/11/2016	17/11/2016	17/11/2016	17/11/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Zinc (total)	µg/l	0.5	ISO 17025	64	29	110	26	150
Aluminium (dissolved)	mg/l	0.001	ISO 17025	0.0039	0.0084	0.0504	0.0019	0.0376
Antimony (dissolved)	µg/l	0.4	ISO 17025	0.7	< 0.4	0.6	0.6	0.6
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.78	0.56	0.57	< 0.15	6.53
Barium (dissolved)	µg/l	0.06	ISO 17025	44	31	60	14	63
Boron (dissolved)	µg/l	10	ISO 17025	230	98	99	200	150
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.04	< 0.02	0.09	< 0.02	< 0.02
Calcium (dissolved)	mg/l	0.012	ISO 17025	440	93	210	140	450
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chromium (III)	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chromium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	0.5	< 0.2	< 0.2
Cobalt (dissolved)	µg/l	0.2	ISO 17025	2.6	0.3	< 0.2	0.3	2.7
Copper (dissolved)	µg/l	0.5	ISO 17025	2.5	5.8	9.8	2.6	2.2
Iron (dissolved)	mg/l	0.004	ISO 17025	< 0.004	0.010	0.15	0.014	1.8
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Magnesium (dissolved)	mg/l	0.005	ISO 17025	91	9.5	40	15	84
Manganese (dissolved)	µg/l	0.05	ISO 17025	260	200	7.2	140	4900
Mercury (dissolved) CV-AFS	ug/l	0.005	NONE	0.011	0.010	0.011	0.005	< 0.005
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	10	2.3	3.8	1.3	1.8
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Silver (dissolved)	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Sodium (dissolved)	mg/l	0.01	ISO 17025	44	28	27	32	200
Tin (dissolved)	µg/l	0.2	ISO 17025	0.81	< 0.20	< 0.20	< 0.20	< 0.20
Vanadium (dissolved)	µg/l	0.2	ISO 17025	0.3	< 0.2	< 0.2	< 0.2	0.3
Zinc (dissolved)	µg/l	0.5	ISO 17025	4.2	2.4	31	4.9	2.8

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Analytical Report Number: 16-33292

Project / Site name: Rail Central, Miltom Malsor

Your Order No: POP 001827

Lab Sample Number				660857	660858	660859	660860	660861
Sample Reference				BH A013	BH G012	BH G010	BH A015	BH L009
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				17/11/2016	17/11/2016	17/11/2016	17/11/2016	17/11/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	µg/l	1	ISO 17025	-	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	-	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	-	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	-	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	-	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	-	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6	µg/l	10	NONE	-	< 10	< 10	< 10	-
TPH-CWG - Aliphatic >C6 - C8	µg/l	10	NONE	-	< 10	< 10	< 10	-
TPH-CWG - Aliphatic >C8 - C10	µg/l	10	NONE	-	< 10	< 10	< 10	-
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	-	< 10	< 10	< 10	-
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	-	< 10	< 10	< 10	-
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	-	< 10	< 10	< 10	-
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	-	< 10	< 10	< 10	-
TPH-CWG - Aliphatic >C16 - C35	µg/l	10	NONE	-	< 10	< 10	< 10	-
TPH-CWG - Aliphatic >C35 - C44	µg/l	10	NONE	-	< 10	< 10	< 10	-
TPH-CWG - Aromatic >C5 - C7	µg/l	10	NONE	-	< 10	< 10	< 10	-
TPH-CWG - Aromatic >C7 - C8	µg/l	10	NONE	-	< 10	< 10	< 10	-
TPH-CWG - Aromatic >C8 - C10	µg/l	10	NONE	-	< 10	< 10	< 10	-
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	-	< 10	< 10	< 10	-
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	-	< 10	< 10	< 10	-
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	-	< 10	< 10	< 10	-
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	-	< 10	< 10	< 10	-
TPH-CWG - Aromatic >C35 - C44	µg/l	10	NONE	-	< 10	< 10	< 10	-
TPH (C5 - C6)	µg/l	10	NONE	-	-	-	-	< 10
TPH (C6 - C7)	µg/l	10	NONE	-	-	-	-	< 10
TPH (C7 - C8)	µg/l	10	NONE	-	-	-	-	< 10
TPH (C8 - C10)	µg/l	10	NONE	-	-	-	-	< 10
TPH (C10 - C12)	µg/l	10	NONE	-	-	-	-	250
TPH (C12 - C16)	µg/l	10	NONE	-	-	-	-	550
TPH (C16 - C21)	µg/l	10	NONE	-	-	-	-	340
TPH (C21 - C35)	µg/l	10	NONE	-	-	-	-	70
TPH (C35 - C44)	µg/l	10	NONE	-	-	-	-	< 10
Pesticides/Herbicides Screen in Water	P/A	N/A	NONE	Absent	Absent	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number: 16-33292

Project / Site name: Rail Central, Miltom Malsor

Your Order No: POP 001827

Lab Sample Number				660862	660863	660864	660865	660866
Sample Reference				BH L002	BH L001	BH G005	BH L007	BH L003
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				17/11/2016	17/11/2016	17/11/2016	17/11/2016	17/11/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.5	7.2	7.0	6.9	7.2
Electrical Conductivity	µS/cm	10	NONE	1600	1400	2000	1500	2700
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Free Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Sulphate as SO_4	µg/l	45	ISO 17025	198000	820000	1240000	684000	1960000
Chloride	mg/l	0.15	ISO 17025	310	37	87	26	61
Fluoride	µg/l	50	ISO 17025	450	280	240	240	230
Ammonium as NH_4	µg/l	15	ISO 17025	530	19	130	35	61
Nitrate as N	mg/l	0.01	ISO 17025	4.65	3.63	0.57	43.5	0.72
Nitrate as NO_3	mg/l	0.05	ISO 17025	20.6	16.1	2.54	193	3.17
Nitrite as N	µg/l	1	ISO 17025	50	46	39	12	20
Nitrite as NO_2	µg/l	5	ISO 17025	160	150	130	38	64
Hardness - Total	mgCaCO3/l	1	ISO 17025	619	1030	1510	996	1910
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Total Phenols								
Total Phenols	µg/l	0.5	NONE	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(ghi)perylene	µg/l	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PAH Sums								
Sum of Benzo(b)fluoranthene & Benzo(k)fluoranthene	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Sum of Benzo(ghi)fluoranthene & Indeno(1,2,3-cd)pyrene	µg/l	0.002	NONE	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Sum of Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(ghi)fluoranthene & Indeno(1,2,3-cd)pyrene	µg/l	0.022	NONE	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02

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Analytical Report Number: 16-33292

Project / Site name: Rail Central, Miltom Malsor

Your Order No: POP 001827

Lab Sample Number				660862	660863	660864	660865	660866
Sample Reference				BH L002	BH L001	BH G005	BH L007	BH L003
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				17/11/2016	17/11/2016	17/11/2016	17/11/2016	17/11/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Zinc (total)	µg/l	0.5	ISO 17025	40	24	64	17	50
Aluminium (dissolved)	mg/l	0.001	ISO 17025	0.0344	0.0031	0.0028	0.0101	0.0024
Antimony (dissolved)	µg/l	0.4	ISO 17025	0.7	0.5	0.7	0.6	0.5
Arsenic (dissolved)	µg/l	0.15	ISO 17025	1.25	0.41	0.82	0.23	0.46
Barium (dissolved)	µg/l	0.06	ISO 17025	41	61	42	51	52
Boron (dissolved)	µg/l	10	ISO 17025	87	290	320	43	440
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	0.02	0.02	0.08	0.02
Calcium (dissolved)	mg/l	0.012	ISO 17025	210	290	410	330	460
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chromium (III)	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.4	0.3	< 0.2	< 0.2	< 0.2
Cobalt (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	4.1	< 0.2	2.2
Copper (dissolved)	µg/l	0.5	ISO 17025	6.7	6.1	2.2	4.3	3.2
Iron (dissolved)	mg/l	0.004	ISO 17025	0.24	0.010	0.031	0.009	0.011
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	0.7	< 0.2	< 0.2	< 0.2
Magnesium (dissolved)	mg/l	0.005	ISO 17025	23	76	120	43	190
Manganese (dissolved)	µg/l	0.05	ISO 17025	17	34	1000	100	750
Mercury (dissolved) CV-AFS	ug/l	0.005	NONE	< 0.005	0.011	0.010	0.010	< 0.005
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05	1.7	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	2.2	2.5	14	2.0	7.3
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Silver (dissolved)	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Sodium (dissolved)	mg/l	0.01	ISO 17025	170	60	43	25	92
Tin (dissolved)	µg/l	0.2	ISO 17025	< 0.20	< 0.20	< 0.20	< 0.20	0.22
Vanadium (dissolved)	µg/l	0.2	ISO 17025	0.6	< 0.2	< 0.2	0.2	< 0.2
Zinc (dissolved)	µg/l	0.5	ISO 17025	2.9	5.2	9.1	1.8	23

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Analytical Report Number: 16-33292

Project / Site name: Rail Central, Miltom Malsor

Your Order No: POP 001827

Lab Sample Number				660862	660863	660864	660865	660866
Sample Reference				BH L002	BH L001	BH G005	BH L007	BH L003
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				17/11/2016	17/11/2016	17/11/2016	17/11/2016	17/11/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	µg/l	1	ISO 17025	< 1.0	-	-	-	-
Toluene	µg/l	1	ISO 17025	< 1.0	-	-	-	-
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	-	-	-	-
p & m-xylene	µg/l	1	ISO 17025	< 1.0	-	-	-	-
o-xylene	µg/l	1	ISO 17025	< 1.0	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	-	-	-	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6	µg/l	10	NONE	-	-	-	-	-
TPH-CWG - Aliphatic >C6 - C8	µg/l	10	NONE	-	-	-	-	-
TPH-CWG - Aliphatic >C8 - C10	µg/l	10	NONE	-	-	-	-	-
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	-	-	-	-	-
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	-	-	-	-	-
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	-	-	-	-	-
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	-	-	-	-	-
TPH-CWG - Aliphatic >C16 - C35	µg/l	10	NONE	-	-	-	-	-
TPH-CWG - Aliphatic >C35 - C44	µg/l	10	NONE	-	-	-	-	-
TPH-CWG - Aromatic >C5 - C7	µg/l	10	NONE	-	-	-	-	-
TPH-CWG - Aromatic >C7 - C8	µg/l	10	NONE	-	-	-	-	-
TPH-CWG - Aromatic >C8 - C10	µg/l	10	NONE	-	-	-	-	-
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	-	-	-	-	-
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	-	-	-	-	-
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	-	-	-	-	-
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	-	-	-	-	-
TPH-CWG - Aromatic >C35 - C44	µg/l	10	NONE	-	-	-	-	-
TPH (C5 - C6)	µg/l	10	NONE	< 10	-	-	-	-
TPH (C6 - C7)	µg/l	10	NONE	< 10	-	-	-	-
TPH (C7 - C8)	µg/l	10	NONE	< 10	-	-	-	-
TPH (C8 - C10)	µg/l	10	NONE	< 10	-	-	-	-
TPH (C10 - C12)	µg/l	10	NONE	< 10	-	-	-	-
TPH (C12 - C16)	µg/l	10	NONE	< 10	-	-	-	-
TPH (C16 - C21)	µg/l	10	NONE	< 10	-	-	-	-
TPH (C21 - C35)	µg/l	10	NONE	< 10	-	-	-	-
TPH (C35 - C44)	µg/l	10	NONE	< 10	-	-	-	-
Pesticides/Herbicides Screen in Water	P/A	N/A	NONE	-	-	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number: 16-33292

Project / Site name: Rail Central, Miltom Malsor

Your Order No: POP 001827

Lab Sample Number				660867	660868			
Sample Reference				BH L010	BH A010			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				17/11/2016	17/11/2016			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.1	7.5			
Electrical Conductivity	µS/cm	10	NONE	1400	1000			
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10			
Free Cyanide	µg/l	10	ISO 17025	< 10	< 10			
Sulphate as SO_4	µg/l	45	ISO 17025	133000	428000			
Chloride	mg/l	0.15	ISO 17025	15	44			
Fluoride	µg/l	50	ISO 17025	240	330			
Ammonium as NH_4	µg/l	15	ISO 17025	< 15	320			
Nitrate as N	mg/l	0.01	ISO 17025	73.4	0.24			
Nitrate as NO_3	mg/l	0.05	ISO 17025	325	1.06			
Nitrite as N	µg/l	1	ISO 17025	12	25			
Nitrite as NO_2	µg/l	5	ISO 17025	40	81			
Hardness - Total	mgCaCO3/l	1	ISO 17025	453	594			
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002	< 0.002			
Total Phenols								
Total Phenols	µg/l	0.5	NONE	< 0.50	< 0.50			
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Indeno(1,2,3-cd)pyrene	µg/l	0.001	NONE	< 0.001	< 0.001			
Benzo(ghi)perylene	µg/l	0.001	NONE	< 0.001	< 0.001			
PAH Sums								
Sum of Benzo(b)fluoranthene & Benzo(k)fluoranthene	µg/l	0.02	NONE	< 0.02	< 0.02			
Sum of Benzo(ghi)fluoranthene & Indeno(1,2,3-cd)pyrene	µg/l	0.002	NONE	< 0.002	< 0.002			
Sum of Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(ghi)fluoranthene & Indeno(1,2,3-cd)pyrene	µg/l	0.022	NONE	< 0.02	< 0.02			

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

Analytical Report Number: 16-33292

Project / Site name: Rail Central, Miltom Malsor

Your Order No: POP 001827

Lab Sample Number				660867	660868			
Sample Reference				BH L010	BH A010			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				17/11/2016	17/11/2016			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Zinc (total)	µg/l	0.5	ISO 17025	17	32			
Aluminium (dissolved)	mg/l	0.001	ISO 17025	< 0.0010	0.0024			
Antimony (dissolved)	µg/l	0.4	ISO 17025	< 0.4	0.4			
Arsenic (dissolved)	µg/l	0.15	ISO 17025	< 0.15	1.09			
Barium (dissolved)	µg/l	0.06	ISO 17025	130	32			
Boron (dissolved)	µg/l	10	ISO 17025	19	520			
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	< 0.02			
Calcium (dissolved)	mg/l	0.012	ISO 17025	170	180			
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0			
Chromium (III)	µg/l	1	NONE	< 1.0	< 1.0			
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.5	< 0.2			
Cobalt (dissolved)	µg/l	0.2	ISO 17025	0.3	0.9			
Copper (dissolved)	µg/l	0.5	ISO 17025	7.4	3.5			
Iron (dissolved)	mg/l	0.004	ISO 17025	0.020	0.006			
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2			
Magnesium (dissolved)	mg/l	0.005	ISO 17025	7.6	35			
Manganese (dissolved)	µg/l	0.05	ISO 17025	2.4	210			
Mercury (dissolved) CV-AFS	ug/l	0.005	NONE	0.007	0.010			
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	< 0.05	< 0.05			
Nickel (dissolved)	µg/l	0.5	ISO 17025	0.7	1.5			
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6	1.4			
Silver (dissolved)	µg/l	0.05	NONE	< 0.05	< 0.05			
Sodium (dissolved)	mg/l	0.01	ISO 17025	15	97			
Tin (dissolved)	µg/l	0.2	ISO 17025	< 0.20	0.20			
Vanadium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2			
Zinc (dissolved)	µg/l	0.5	ISO 17025	0.9	2.1			

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Analytical Report Number: 16-33292

Project / Site name: Rail Central, Miltom Malsor

Your Order No: POP 001827

Lab Sample Number				660867	660868			
Sample Reference				BH L010	BH A010			
Sample Number				None Supplied	None Supplied			
Depth (m)				None Supplied	None Supplied			
Date Sampled				17/11/2016	17/11/2016			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	µg/l	1	ISO 17025	-	-			
Toluene	µg/l	1	ISO 17025	-	-			
Ethylbenzene	µg/l	1	ISO 17025	-	-			
p & m-xylene	µg/l	1	ISO 17025	-	-			
o-xylene	µg/l	1	ISO 17025	-	-			
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	-	-			
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6	µg/l	10	NONE	-	-			
TPH-CWG - Aliphatic >C6 - C8	µg/l	10	NONE	-	-			
TPH-CWG - Aliphatic >C8 - C10	µg/l	10	NONE	-	-			
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	-	-			
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	-	-			
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	-	-			
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	-	-			
TPH-CWG - Aliphatic >C16 - C35	µg/l	10	NONE	-	-			
TPH-CWG - Aliphatic >C35 - C44	µg/l	10	NONE	-	-			
TPH-CWG - Aromatic >C5 - C7	µg/l	10	NONE	-	-			
TPH-CWG - Aromatic >C7 - C8	µg/l	10	NONE	-	-			
TPH-CWG - Aromatic >C8 - C10	µg/l	10	NONE	-	-			
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	-	-			
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	-	-			
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	-	-			
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	-	-			
TPH-CWG - Aromatic >C35 - C44	µg/l	10	NONE	-	-			
TPH (C5 - C6)	µg/l	10	NONE	-	-			
TPH (C6 - C7)	µg/l	10	NONE	-	-			
TPH (C7 - C8)	µg/l	10	NONE	-	-			
TPH (C8 - C10)	µg/l	10	NONE	-	-			
TPH (C10 - C12)	µg/l	10	NONE	-	-			
TPH (C12 - C16)	µg/l	10	NONE	-	-			
TPH (C16 - C21)	µg/l	10	NONE	-	-			
TPH (C21 - C35)	µg/l	10	NONE	-	-			
TPH (C35 - C44)	µg/l	10	NONE	-	-			
Pesticides/Herbicides Screen in Water	P/A	N/A	NONE	-	-			

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number : 16-33292

Project / Site name: Rail Central, Miltom Malsor

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonium as NH4 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Bromate in Water	Determination of bromate in waters based on ion chromatography. Accredited matrices GW, PW, SW.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Chloride in water	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025
Cr (III) in water	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Electrical conductivity at 20oC of water	Determination of electrical conductivity in water by electrometric measurement.	In-house method	L031-PL	W	NONE
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW, PW, GW.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033-PL	W	ISO 17025
Free cyanide in water	Determination of free cyanide by distillation followed by colorimetry.Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Mercury Low Level (Dissolved) in Water	Mercury in water by millennium merlin AFS analyser	In-house method based on USEPA method 1631	L085-PL	W	NONE
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
Nitrite as N in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry). Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrite in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry).Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025

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Analytical Report Number : 16-33292

Project / Site name: Rail Central, Miltom Malsor

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Pesticides and Herbicides in water screening	In-house method	In-house method		W	NONE
pH at 20oC in water (automated)	Determination of pH in water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	W	ISO 17025
Phenols, speciated, in water, by GCMS	Determination of speciated phenols in water by extraction in hexane followed by GC-MS.	In-house method based on USEPA 8270	L070-PL	W	NONE
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L0102B-PL	W	ISO 17025
Speciated EPA-16 PAHs in water (LOW LEVEL Dets)	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Specific PAH sums in water	Determination of PAH compounds in water by extraction in hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L070-PL	W	NONE
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium. Accredited Matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045-PL	W	ISO 17025
TPH 8 Band (Water)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In house method	L070-PL	W	NONE
TPH Chromatogram	TPH Chromatogram.	In-house method	L070-PL	W	NONE
TPH in (Water)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding.	L070-PL	W	NONE
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	NONE

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

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Analytical Report Number : 16-33546

Project / Site name:	Rail Central, Miltom Malsor	**Samples received on:**	22/11/2016
Your job number:	C151171	**Samples instructed on:**	22/11/2016
Your order number:	POP001934	**Analysis completed by:**	29/11/2016
Report Issue Number:	1	**Report issued on:**	29/11/2016
Samples Analysed:	5 water samples		

Signed:

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

Signed:

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

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

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

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

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

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

Analytical Report Number: 16-33546

Project / Site name: Rail Central, Miltom Malsor

Your Order No: POP001934

Lab Sample Number				662224	662225	662226	662227	662228
Sample Reference				WS S01	WS S06	WS S04	WS S08	BH RB02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				21/11/2016	21/11/2016	21/11/2016	21/11/2016	21/11/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	7.4	8.9	7.2	7.3	7.0
Electrical Conductivity	µS/cm	10	NONE	510	320	1900	830	1400
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Free Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Sulphate as SO_4	µg/l	45	ISO 17025	86900	85700	551000	119000	608000
Chloride	mg/l	0.15	ISO 17025	17	17	300	19	48
Fluoride	µg/l	50	ISO 17025	380	930	340	350	240
Ammonium as NH_4	µg/l	15	ISO 17025	< 15	< 15	< 15	< 15	< 15
Nitrate as N	mg/l	0.01	ISO 17025	0.80	1.78	0.47	7.88	2.88
Nitrate as NO_3	mg/l	0.05	ISO 17025	3.54	7.88	2.06	34.9	12.7
Nitrite as N	µg/l	1	ISO 17025	3.4	35	16	42	32
Nitrite as NO_2	µg/l	5	ISO 17025	11	120	52	140	110
Hardness - Total	mgCaCO3/l	1	ISO 17025	298	53.4	946	390	896
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Total Phenols								
Total Phenols	µg/l	0.5	NONE	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(ghi)perylene	µg/l	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PAH Sums								
Sum of Benzo(b)fluoranthene & Benzo(k)fluoranthene	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Sum of Benzo(ghi)fluoranthene & Indeno(1,2,3-cd)pyrene	µg/l	0.002	NONE	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Sum of Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(ghi)fluoranthene & Indeno(1,2,3-cd)pyrene	µg/l	0.022	NONE	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02

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Analytical Report Number: 16-33546

Project / Site name: Rail Central, Miltom Malsor

Your Order No: POP001934

Lab Sample Number				662224	662225	662226	662227	662228
Sample Reference				WS S01	WS S06	WS S04	WS S08	BH RB02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				21/11/2016	21/11/2016	21/11/2016	21/11/2016	21/11/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Zinc (total)	µg/l	0.5	ISO 17025	130	85	51	92	20
Aluminium (dissolved)	mg/l	0.001	ISO 17025	0.0256	0.240	0.0018	0.0084	0.0045
Antimony (dissolved)	µg/l	0.4	ISO 17025	0.6	1.0	0.6	0.6	0.6
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.24	1.02	0.24	0.80	0.29
Barium (dissolved)	µg/l	0.06	ISO 17025	20	3.1	50	35	69
Boron (dissolved)	µg/l	10	ISO 17025	29	34	88	45	78
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Calcium (dissolved)	mg/l	0.012	ISO 17025	98	18	330	130	310
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chromium (III)	µg/l	1	NONE	< 1.0	1.5	< 1.0	< 1.0	< 1.0
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.4	1.5	0.3	0.3	0.4
Cobalt (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	1.5	< 0.2
Copper (dissolved)	µg/l	0.5	ISO 17025	3.1	8.7	7.6	5.7	2.5
Iron (dissolved)	mg/l	0.004	ISO 17025	0.71	0.31	0.006	0.072	0.19
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Magnesium (dissolved)	mg/l	0.005	ISO 17025	13	2.3	32	16	31
Manganese (dissolved)	µg/l	0.05	ISO 17025	5.2	0.77	47	20	34
Mercury (dissolved) CV-AFS	µg/l	0.005	NONE	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	< 0.05	2.3	< 0.05	< 0.05	< 0.05
Nickel (dissolved)	µg/l	0.5	ISO 17025	1.1	0.9	2.1	4.6	2.3
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6	51	< 0.6	22	2.0
Silver (dissolved)	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Sodium (dissolved)	mg/l	0.01	ISO 17025	15	57	140	80	32
Tin (dissolved)	µg/l	0.2	ISO 17025	0.25	< 0.20	< 0.20	< 0.20	0.90
Vanadium (dissolved)	µg/l	0.2	ISO 17025	0.5	5.4	< 0.2	3.0	< 0.2
Zinc (dissolved)	µg/l	0.5	ISO 17025	2.0	5.1	3.7	3.3	9.6

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Analytical Report Number: 16-33546

Project / Site name: Rail Central, Miltom Malsor

Your Order No: POP001934

Lab Sample Number				662224	662225	662226	662227	662228
Sample Reference				WS S01	WS S06	WS S04	WS S08	BH RB02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				21/11/2016	21/11/2016	21/11/2016	21/11/2016	21/11/2016
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C6 - C8	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C8 - C10	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C35 - C44	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C5 - C7	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C7 - C8	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C8 - C10	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C35 - C44	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10

U/S = Unsuitable Sample I/S = Insufficient Sample

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

Analytical Report Number : 16-33546

Project / Site name: Rail Central, Miltom Malsor

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonium as NH4 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Bromate in Water	Determination of bromate in waters based on ion chromatography. Accredited matrices GW, PW, SW.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Chloride in water	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025
Cr (III) in water	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Electrical conductivity at 20oC of water	Determination of electrical conductivity in water by electrometric measurement.	In-house method	L031-PL	W	NONE
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW, PW, GW.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033-PL	W	ISO 17025
Free cyanide in water	Determination of free cyanide by distillation followed by colorimetry.Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Mercury Low Level (Dissolved) in Water	Mercury in water by millennium merlin AFS analyser	In-house method based on USEPA method 1631	L085-PL	W	NONE
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
Nitrite as N in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry). Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrite in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry).Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025

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Analytical Report Number : 16-33546

Project / Site name: Rail Central, Miltom Malsor

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
pH at 20oC in water (automated)	Determination of pH in water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	W	ISO 17025
Phenols, speciated, in water, by GCMS	Determination of speciated phenols in water by extraction in hexane followed by GC-MS.	In-house method based on USEPA 8270	L070-PL	W	NONE
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L0102B-PL	W	ISO 17025
Speciated EPA-16 PAHs in water (LOW LEVEL Dets)	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Specific PAH sums in water	Determination of PAH compounds in water by extraction in hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L070-PL	W	NONE
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium. Accredited Matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045-PL	W	ISO 17025
TPH Chromatogram	TPH Chromatogram.	In-house method	L070-PL	W	NONE
TPH in (Water)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding.	L070-PL	W	NONE
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	NONE

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

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Analytical Report Number : 17-37161

Project / Site name:	Rail Central, Milton Malsor	**Samples received on:**	12/01/2017
Your job number:	C 151171	**Samples instructed on:**	12/01/2017
Your order number:	POP003375	**Analysis completed by:**	18/01/2017
Report Issue Number:	1	**Report issued on:**	18/01/2017
Samples Analysed:	5 water samples		

Signed:

Dr Claire Stone
Quality Manager
For & on behalf of i2 Analytical Ltd.

Signed:

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

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

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

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

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

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

Analytical Report Number: 17-37161

Project / Site name: Rail Central, Milton Malsor

Your Order No: POP003375

Lab Sample Number				684901	684902	684903	684904	684905
Sample Reference				SW 1	SW 2	SW 3	SW 4	SW 5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				11/01/2017	11/01/2017	11/01/2017	11/01/2017	11/01/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
General Inorganics								
pH	pH Units	N/A	ISO 17025	8.2	8.2	8.2	8.1	7.8
Electrical Conductivity at 20 °C	µS/cm	10	NONE	810	810	780	820	740
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Free Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Sulphate as SO_4	µg/l	45	ISO 17025	102000	103000	101000	104000	151000
Chloride	mg/l	0.15	ISO 17025	63	64	60	79	40
Fluoride	µg/l	50	ISO 17025	340	350	380	390	480
Ammonium as NH_4	µg/l	15	ISO 17025	190	59	46	170	760
Nitrate as N	mg/l	0.01	ISO 17025	5.86	6.08	8.65	9.37	8.34
Nitrate as NO_3	mg/l	0.05	ISO 17025	26.0	26.9	38.3	41.5	36.9
Nitrite as N	µg/l	1	ISO 17025	23	21	24	27	32
Nitrite as NO_2	µg/l	5	ISO 17025	76	69	79	89	110
Hardness - Total	mgCaCO3/l	1	ISO 17025	334	328	318	340	344
Bromate by IC	mg/l	0.002	ISO 17025	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Total Phenols								
Total Phenols	µg/l	0.5	NONE	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Speciated PAHs								
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(ghi)perylene	µg/l	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PAH Sums								
Sum of Benzo(b)fluoranthene & Benzo(k)fluoranthene	µg/l	0.02	NONE	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Sum of Benzo(ghi)fluoranthene & Indeno(1,2,3-cd)pyrene	µg/l	0.002	NONE	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Sum of Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(ghi)fluoranthene & Indeno(1,2,3-cd)pyrene	µg/l	0.022	NONE	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02

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Analytical Report Number: 17-37161

Project / Site name: Rail Central, Milton Malsor

Your Order No: POP003375

Lab Sample Number				684901	684902	684903	684904	684905
Sample Reference				SW 1	SW 2	SW 3	SW 4	SW 5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				11/01/2017	11/01/2017	11/01/2017	11/01/2017	11/01/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Zinc (total)	µg/l	0.5	ISO 17025	12	15	11	15	4.5
Aluminium (dissolved)	mg/l	0.001	ISO 17025	0.0085	0.0056	0.0085	0.0116	0.0107
Antimony (dissolved)	µg/l	0.4	ISO 17025	0.5	0.8	0.7	0.6	0.9
Arsenic (dissolved)	µg/l	0.15	ISO 17025	0.63	0.34	0.47	0.43	0.68
Barium (dissolved)	µg/l	0.06	ISO 17025	22	22	23	26	28
Boron (dissolved)	µg/l	10	ISO 17025	59	59	57	59	41
Cadmium (dissolved)	µg/l	0.02	ISO 17025	< 0.02	0.02	0.06	< 0.02	< 0.02
Calcium (dissolved)	mg/l	0.012	ISO 17025	120	120	110	120	110
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chromium (III)	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.3	0.5	< 0.2	0.3	0.3
Cobalt (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Copper (dissolved)	µg/l	0.5	ISO 17025	5.3	4.9	5.4	7.2	10
Iron (dissolved)	mg/l	0.004	ISO 17025	0.22	0.055	0.071	0.34	0.19
Lead (dissolved)	µg/l	0.2	ISO 17025	< 0.2	0.2	0.6	0.3	< 0.2
Magnesium (dissolved)	mg/l	0.005	ISO 17025	9.3	9.5	11	10	18
Manganese (dissolved)	µg/l	0.05	ISO 17025	6.9	2.6	8.3	4.3	2.1
Mercury (dissolved) CV-AFS	ug/l	0.005	NONE	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Molybdenum (dissolved)	µg/l	0.05	ISO 17025	0.51	0.37	0.69	0.73	0.61
Nickel (dissolved)	µg/l	0.5	ISO 17025	1.9	2.3	2.5	2.5	2.0
Selenium (dissolved)	µg/l	0.6	ISO 17025	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Silver (dissolved)	µg/l	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Sodium (dissolved)	mg/l	0.01	ISO 17025	31	32	30	43	11
Tin (dissolved)	µg/l	0.2	ISO 17025	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Vanadium (dissolved)	µg/l	0.2	ISO 17025	0.6	0.7	0.6	0.5	0.5
Zinc (dissolved)	µg/l	0.5	ISO 17025	2.7	5.6	6.2	5.7	3.8

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Analytical Report Number: 17-37161

Project / Site name: Rail Central, Milton Malsor

Your Order No: POP003375

Lab Sample Number				684901	684902	684903	684904	684905
Sample Reference				SW 1	SW 2	SW 3	SW 4	SW 5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				11/01/2017	11/01/2017	11/01/2017	11/01/2017	11/01/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >C5 - C6	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C6 - C8	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C8 - C10	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C16 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aliphatic >C35 - C44	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C5 - C7	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C7 - C8	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C8 - C10	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >C35 - C44	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
Pesticides/Herbicides Screen in Water	P/A	N/A	NONE	Absent	Absent	Absent	Absent	Absent

U/S = Unsuitable Sample I/S = Insufficient Sample

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Analytical Report Number : 17-37161

Project / Site name: Rail Central, Milton Malsor

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonium as NH4 in water	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Bromate in Water	Determination of bromate in waters based on ion chromatography. Accredited matrices GW, PW, SW.	In house method based on Standard Methods for the Analysis of Water and Waste Water, method 4500	L008-PL	W	ISO 17025
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Chloride in water	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260. Accredited matrices: SW, PW, GW.	L082-PL	W	ISO 17025
Cr (III) in water	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Electrical conductivity at 20oC of water	Determination of electrical conductivity in water by electrometric measurement.	In-house method	L031-PL	W	NONE
Fluoride in water	Determination of fluoride in water by 1:1 ratio with a buffer solution followed by Ion Selective Electrode. Accredited matrices: SW, PW, GW.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033-PL	W	ISO 17025
Free cyanide in water	Determination of free cyanide by distillation followed by colorimetry.Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Mercury Low Level (Dissolved) in Water	Mercury in water by millennium merlin AFS analyser	In-house method based on USEPA method 1631	L085-PL	W	NONE
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Nitrate as N in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
Nitrate in water	Determination of nitrate by reaction with sodium salicylate and colorimetry. Accredited matrices SW, GW, PW	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08,	L078-PL	W	ISO 17025
Nitrite as N in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry). Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Nitrite in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by discrete analyser (colorimetry).Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025

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

Analytical Report Number : 17-37161

Project / Site name: Rail Central, Milton Malsor

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Pesticides and Herbicides in water screening	In-house method	In-house method		W	NONE
pH at 20oC in water (automated)	Determination of pH in water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	W	ISO 17025
Phenols, speciated, in water, by GCMS	Determination of speciated phenols in water by extraction in hexane followed by GC-MS.	In-house method based on USEPA 8270	L070-PL	W	NONE
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L0102B-PL	W	ISO 17025
Speciated EPA-16 PAHs in water (LOW LEVEL Dets)	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Specific PAH sums in water	Determination of PAH compounds in water by extraction in hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L070-PL	W	NONE
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium. Accredited Matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045-PL	W	ISO 17025
TPH Chromatogram	TPH Chromatogram.	In-house method	L070-PL	W	NONE
TPH in (Water)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding.	L070-PL	W	NONE
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	NONE

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

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

Assessment of Chemicals of Potential Concern to Human Health

Hydrock

All values in mg/kg unless otherwise stated

Chemical of Potential Concern	Lab. RL	No. Samples	Min. Value	Max. Value	No. Samples > or = GAC	GAC	US_{95}	Result of Significance Test	Soil Type	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG
									Location & Depth	TPG066	TPG066	TPG066	TPG068	TPG068	TPG068	WSBL01	WSBL02	WSBL02	WSBL02	WSBL02	WSBL05	WSBL05	WSBL06	WSBL07	WSBL07	WSBL08	WSBL10
										0.5	1.6	2.5	0.5	1	2	0.3	0.3	1.5	2.5	3.5	2.5	3.5	1.2	1.2	2.5	2.5	0.3
Aliphatics EC5-EC6	0.1	18	0.001	0.1	0	1800	0.08335	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Aliphatics >EC6-EC8	0.1	18	0.001	0.1	0	5700	0.08335	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Aliphatics >EC8-EC10	0.1	18	0.001	0.1	0	760	0.08335	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Aliphatics >EC10-EC12	1	18	1	3.9	0	4200	1.902322	POTENTIALLY SUITABLE FOR USE		1	3.9	1	1.3	1.4	1	1	1	1	1	1	1	1	1	1	1	1	1
Aliphatics >EC12-EC16	2	18	2	29	0	13000	14.5496	POTENTIALLY SUITABLE FOR USE		2	16	2	3.9	10	4.5	2	2	2	6.9	2	2	2	29	2	2	22	2
Aliphatics >EC16-EC35	10	18	10	640	0	270000	239.7154	POTENTIALLY SUITABLE FOR USE		10	190	10	28	170	90	10	10	10	10	10	10	10	190	29	31	640	10
Aliphatics >EC35-EC44	8.4	18	8.4	120	0	270000	55.23615	POTENTIALLY SUITABLE FOR USE		8.4	71	8.4	10	57	35	13	8.4	8.4	8.4	8.4	8.4	8.4	15	21	23	120	8.4
Aromatics EC5-EC7	0.1	18	0.001	0.1	0	28	0.08335	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Aromatics >EC7-EC8	0.1	18	0.001	0.1	0	53	0.08335	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Aromatics >EC8-EC10	0.1	18	0.001	0.1	0	22	0.08335	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Aromatics >EC10-EC12	1	18	1	4.6	0	32	2.113034	POTENTIALLY SUITABLE FOR USE		1	4.6	1	1	1	1.4	1	1	1	1.3	1	1	1	1	1	1	1.1	1
Aromatics >EC12-EC16	2	18	2	28	0	58	14.71992	POTENTIALLY SUITABLE FOR USE		2	12	2	2	8.9	4.9	2.6	2	2	10	2	2	2	25	6.6	2	28	2
Aromatics >EC16-EC21	10	18	10	190	1	110	73.32815	POTENTIALLY SUITABLE FOR USE		10	37	10	10	26	17	10	10	10	13	10	10	10	82	28	10	190	10
Aromatics >EC21-EC35	10	18	10	450	0	790	168.1583	POTENTIALLY SUITABLE FOR USE		10	110	10	10	92	74	17	37	10	10	10	10	10	110	69	43	450	32
Aromatics >EC35-EC44	8.4	18	8.4	120	0	790	56.8303	POTENTIALLY SUITABLE FOR USE		8.4	40	8.4	8.4	31	27	42	51	16	8.4	8.4	8.4	8.4	25	33	31	120	46
									HAZARD QUOTIENTS FOR EACH FRACTION																				
ADDITIVITY CHECK								Aliphatics EC5-EC6		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
								Aliphatics >EC6-EC8		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
								Aliphatics >EC8-EC10		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Considered additive								Aliphatics >EC10-EC12		0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
								Aliphatics >EC12-EC16		0.000	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.002	0.000	0.000	0.002	0.000
								Aliphatics >EC16-EC35		0.000	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.002	0.000
								Aliphatics >EC35-EC44		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
								Aromatics EC5-EC7		0.004	0.004	0.004	0.004	0.004	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
								Aromatics >EC7-EC8		0.002	0.002	0.002	0.002	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
								Aromatics >EC8-EC10		0.005	0.005	0.005	0.005	0.005	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Considered additive								Aromatics >EC10-EC12		0.031	0.144	0.031	0.031	0.031	0.044	0.031	0.031	0.031	0.041	0.031	0.031	0.031	0.031	0.031	0.031	0.034	0.031
								Aromatics >EC12-EC16		0.034	0.207	0.034	0.034	0.153	0.084	0.045	0.034	0.034	0.172	0.034	0.034	0.034	0.431	0.114	0.034	0.483	0.034
								Aromatics >EC16-EC21		0.091	0.336	0.091	0.091	0.236	0.155	0.091	0.091	0.091	0.118	0.091	0.091	0.091	0.745	0.255	0.091	1.727	0.091
Considered additive								Aromatics >EC21-EC35		0.013	0.139	0.013	0.013	0.116	0.094	0.022	0.047	0.013	0.013	0.013	0.013	0.013	0.139	0.087	0.054	0.570	0.041
								Aromatics >EC35-EC44		0.011	0.051	0.011	0.011	0.039	0.034	0.053	0.065	0.020	0.011	0.011	0.011	0.011	0.032	0.042	0.039	0.152	0.058
								Hazard Index for ali>C8-C16		**0.001**	**0.002**	**0.001**	**0.001**	**0.001**	**0.001**	**0.000**	**0.000**	**0.000**	**0.001**	**0.000**	**0.000**	**0.000**	**0.002**	**0.000**	**0.000**	**0.002**	**0.000**
								Hazard Index for aro>C8-C16		**0.070**	**0.355**	**0.070**	**0.070**	**0.189**	**0.133**	**0.076**	**0.066**	**0.066**	**0.213**	**0.066**	**0.066**	**0.066**	**0.462**	**0.145**	**0.066**	**0.517**	**0.066**
								Hazard Index for aro>C16-C35		**0.104**	**0.476**	**0.104**	**0.104**	**0.353**	**0.248**	**0.112**	**0.138**	**0.104**	**0.131**	**0.104**	**0.104**	**0.104**	**0.885**	**0.342**	**0.145**	**2.297**	**0.131**

Hazard Index table - HI or HQ greater than 1 highlighted with yellow shading.

Legend: Main table values in blue are at or below the laboratory reporting limit (where a single value is indicated) and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate.
Main table alues in red are equal to, or greater than, the generic assessment criterion (GAC).
MG denotes Made Ground
NAT denotes natural ground

Risk parameter: Human health - allotments (2.5%SOM)
Data set: RATHVILLY
Client: Ashfield Land
Site: Rail Central
Job no.: C151171
Lab. report no(s).: 17-41138-1,17-50997-1

Assessment of Chemicals of Potential Concern to Human Health

Hydrock

All values in mg/kg unless otherwise stated

Chemical of Potential Concern	Lab. RL	No. Samples	Min. Value	Max. Value	No. Samples > or = GAC	GAC	US_{95}	Result of Significance Test	TPT010	TPT011	TPT021	TPT005	TPT022	TPL011	TPL010	TPT027	TPT028	TPT004	WSCL002	WSLF003	WSLF004	WSLF004	TPG036	TPG032	WSS08	WSS02	WSS03	WSS09	HPS01	HPS02	HPS03	HPS04	TPLF010
								Soil Type	TPT010	TPT011	TPT021	TPT005	TPT022	TPL011	TPL010	TPT027	TPT028	TPT004	WSCL002	WSLF003	WSLF004	WSLF004	TPG036	TPG032	WSS08	WSS02	WSS03	WSS09	HPS01	HPS02	HPS03	HPS04	TPLF010
								Location & Depth	2.40-3.00	2.80-3.00	1.80-2.40	0.45-1.10	1.5	0.8	0.15	0.4	0.3	0.3	0.2	0.2	0.2	1.4	0.1	0.2	1.1	0.4	1.2	1.25	0	0	0	0	0.15
									MG - RC	MG - RC	MG - RC	MG	MG - RC	MG - LF	TS	MG	MG	TS	TS	MG	MG	GT	TS	TS	MG	MG	WMS	WMS	TS	TS	TS	TS	MG - LF
Aliphatics EC5-EC6	0.1	25	0.1	0.1	0	42	0.1	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Aliphatics >EC6-EC8	0.1	25	0.1	0.1	0	100	0.1	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Aliphatics >EC8-EC10	0.1	25	0.1	0.1	0	27	0.1	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Aliphatics >EC10-EC12	1	25	1	4.6	0	48	1.78881	POTENTIALLY SUITABLE FOR USE	1	1	1	1	1	1	1	1	1	1	1	1	1	1.4	1	1	1	1	1	1	4.6	1	1	1	1
Aliphatics >EC12-EC16	2	25	2	27	1	24	9.16121	POTENTIALLY SUITABLE FOR USE	2	2	2	2	2	2	2	2	2	2	2	2	2	21	2	2	2	2	2	2	27	2	2	3.1	2
Aliphatics >EC16-EC35	10	25	10	700	0	65000	175.012	POTENTIALLY SUITABLE FOR USE	10	10	10	10	10	10	10	43	10	100	10	10	10	700	10	10	10	120	120	10	40	10	10	10	43
Aliphatics >EC35-EC44	8.4	25	8.4	390	0	65000	101.518	POTENTIALLY SUITABLE FOR USE	8.4	8.4	8.4	8.4	8.4	8.4	8.4	14	8.4	44	8.4	8.4	8.4	390	8.4	8.4	8.4	100	100	8.4	8.4	8.4	8.4	8.4	14
Aromatics EC5-EC7	0.1	25	0.1	0.1	0	73	0.1	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Aromatics >EC7-EC8	0.1	25	0.1	0.1	0	130	0.1	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Aromatics >EC8-EC10	0.1	25	0.1	0.1	0	35	0.1	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Aromatics >EC10-EC12	1	25	1	3.4	0	75	1.51456	POTENTIALLY SUITABLE FOR USE	1	1	1	1	1	1	1	1	1	1	1	1	1	3.4	1	1	1	1	1	1	1	1	1	1	1
Aromatics >EC12-EC16	2	25	2	46	0	150	11.5168	POTENTIALLY SUITABLE FOR USE	2	2	2	2	2	2	2	2	2	2.2	2	2	2	46	2	2	2	3.1	3.1	2	2	2	2	2	2
Aromatics >EC16-EC21	10	25	10	360	1	260	85.5076	POTENTIALLY SUITABLE FOR USE	10	10	10	10	10	10	10	10	10	23	10	10	10	360	10	10	10	10	10	10	10	10	10	10	10
Aromatics >EC21-EC35	10	25	10	1600	1	1100	368.759	POTENTIALLY SUITABLE FOR USE	10	10	10	10	10	10	10	10	10	130	10	10	10	1600	10	10	10	170	170	10	10	10	10	15	10
Aromatics >EC35-EC44	8.4	25	8.4	1400	1	1100	324.553	POTENTIALLY SUITABLE FOR USE	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	92	8.4	8.4	8.4	1400	8.4	8.4	8.4	180	180	8.4	8.4	8.4	8.4	8.4	8.4

ADDITIVITY CHECK		HAZARD QUOTIENTS FOR EACH FRACTION																														
	Aliphatics EC5-EC6	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
	Aliphatics >EC6-EC8	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Considered additive	Aliphatics >EC8-EC10	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
	Aliphatics >EC10-EC12	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.021	0.029	0.021	0.021	0.021	0.021	0.021	0.021	0.096	0.021	0.021	0.021	0.021
	Aliphatics >EC12-EC16	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.875	0.083	0.083	0.083	0.083	0.083	0.083	1.125	0.083	0.083	0.129	0.083
	Aliphatics >EC16-EC35	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.002	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.000	0.002	0.002	0.000	0.001	0.000	0.000	0.000	0.000	0.001
	Aliphatics >EC35-EC44	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Aromatics EC5-EC7	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	Aromatics >EC7-EC8	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Considered additive	Aromatics >EC8-EC10	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
	Aromatics >EC10-EC12	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.045	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013
	Aromatics >EC12-EC16	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.015	0.013	0.013	0.013	0.307	0.013	0.013	0.013	0.013	0.021	0.021	0.013	0.013	0.013	0.013	0.013	0.013	0.013
Considered additive	Aromatics >EC16-EC21	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.088	0.038	0.038	0.038	1.385	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038
	Aromatics >EC21-EC35	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.118	0.009	0.009	0.009	1.455	0.009	0.009	0.009	0.155	0.155	0.009	0.009	0.009	0.009	0.009	0.014	0.009
	Aromatics >EC35-EC44	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.084	0.008	0.008	0.008	1.273	0.008	0.008	0.008	0.164	0.164	0.008	0.008	0.008	0.008	0.008	0.008	0.008
	Hazard Index for ali>C8-C16	0.108	0.108	0.108	0.108	0.108	0.108	0.108	0.108	0.108	0.108	0.108	0.108	0.108	0.908	0.108	0.108	0.108	0.108	0.108	0.108	1.225	0.108	0.108	0.154	0.108
	Hazard Index for aro>C8-C16	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.030	0.031	0.030	0.030	0.030	0.355	0.030	0.030	0.030	0.037	0.037	0.030	0.030	0.030	0.030	0.030	0.030	0.030
	Hazard Index for aro>C16-C35	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.207	0.048	0.048	0.048	2.839	0.048	0.048	0.048	0.193	0.193	0.048	0.048	0.048	0.048	0.052	0.048

Hazard Index table - HI or HQ greater than 1 highlighted with yellow shading.

Risk parameter: Human health - residential with plant uptake (1%SOM)
Data set: ALL LEVEL 2
Client: Ashfield Land
Site: Rail Central
Job no.: C151171
Lab. report no(s).: 16-27565, 16-28522, 16-29767

Legend: Main table values in blue are at or below the laboratory reporting limit (where a single value is indicated) and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate.
Main table alues in red are equal to, or greater than, the generic assessment criterion (GAC).
MG denotes Made Ground
NAT denotes natural ground

Determinand	Includes risk assessment fractions	GAC (mg/kg) Commercial 6% SOM	Lowest GAC from list (mg/kg)	Laboratory	WSS07	WSS07	WSS05	WSS05	WSS06	WSS06	WSS06	WSS02	WSS03	WSS01	WSS01	WSS04	WSS04	WSS09
				Reporting Limit (mg/kg)	0.3	1.25	0.5	1.25	0.4	1	1.25	1.3	0.5	0.3	1.25	0.35	1.25	0.35
					MG	WMS	MG	WMS	MG	MG	WMS	WMS	MG	MG	MG	MG	WMS	MG
EC5-EC6	Ali EC5-EC6	1200	1200	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Aro EC5-EC7	4700																
>EC6-EC7	Ali >EC6-EC8	740	740	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Aro EC5-EC7	4700																
>EC7-EC8	Ali >EC6-EC8	740	740	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Aro >EC7-EC8	4400																
>EC8-EC10	Ali >EC8-EC10	450	450	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Aro >EC8-EC10	3600																
>EC10-EC12	Ali >EC10-EC12	280	280	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Aro >EC10-EC12	2200																
>EC12-EC16	Ali >EC12-EC16	140	140	1	1	1	1	1	1	1	1	1	1	4.4	1	2.1	1	1
	Aro >EC12-EC16	38000																
>EC16-EC21	Ali >EC16-EC35	1000000	28000	1	1	1	1	1	1	1	1	1	1	26	1	21	1	1
	Aro >EC16-EC21	28000																
>EC21-EC35	Ali >EC16-EC35	1000000	28000	1	1	1	1	1	1	1	1	1	1	600	1	650	1	1
	Aro >EC21-EC35	28000																
>EC35-EC40	Ali >EC35-EC44	1000000	28000	1	1	1	1	1	1	1	1	1	1	520	1	610	1	1
	Aro >EC35-EC44	28000																
Benzene	n/a	90	90	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Toluene	n/a	4400	4400	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Ethylbenzene	n/a	2800	2800	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Xylene, o-	n/a	2600	2600	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Xylenes, m- & p-	n/a	3200	3200	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
MTBE	n/a	27000	27000	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Fraction organic C (range 0-1)	n/a	n/a	n/a															
SOM (%)	n/a	n/a	n/a															
Data set:	**SERVICE STATION**			**Red text**	**denotes sample at or below reporting limit**													
Client:	**Ashfield Land**			**Yellow shading**	**dentoes exceedance of the GAC or Hazard Index >1**													
Site:	**Rail Central**																	
Job no.:	**C151171**																	
Lab. report no(s).:	**16-28522**																	
Additivity check																		
Considered potentially additive		>EC8-EC10	Hazard Quotient		0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
		>EC10-EC12	Hazard Quotient		0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
		>EC12-EC16	Hazard Quotient		0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.031	0.007	0.015	0.007	0.007
			Hazard Index		**0.013**	**0.013**	**0.013**	**0.013**	**0.013**	**0.013**	**0.013**	**0.013**	**0.013**	**0.037**	**0.013**	**0.021**	**0.013**	**0.013**
Considered potentially additive		>EC16-EC21	Hazard Quotient		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000
		>EC21-EC35	Hazard Quotient		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.021	0.000	0.023	0.000	0.000
			Hazard Index		**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.022**	**0.000**	**0.024**	**0.000**	**0.000**

Assessment of Chemicals of Potential Concern to Human Health

Hydrock

All values in mg/kg unless otherwise stated								Soil Type	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG
								Location & Depth	TPG066	TPG066	TPG066	TPG068	TPG068	TPG068	WSBL01	WSBL02	WSBL02	WSBL02	WSBL02	WSBL05	WSBL05	WSBL06	WSBL07	WSBL07	WSBL07	WSBL09	WSBL09	WSBL10	WSBL10
Chemical of Potential Concern	**Lab. RL**	**No. Samples**	**Min. Value**	**Max. Value**	**No. Samples > or = GAC**	**GAC**	**US_{95}**	**Result of Significance Test**	**0.5**	**1.6**	**2.5**	**0.5**	**1**	**2**	**0.3**	**0.3**	**1.5**	**2.5**	**3.5**	**2.5**	**3.5**	**1.2**	**1.2**	**2.5**	**3.5**	**1.2**	**3.2**	**1.5**	**2.5**
Arsenic	1	21	9.8	43	0	640	29.52159773	POTENTIALLY SUITABLE FOR USE	23	25	16	34	20	9.8	25	30	28	19	10	17	14	43	29	25	13	16	24	19	13
Beryllium	0.06	21	0.41	8.2	0	390	3.061923585	POTENTIALLY SUITABLE FOR USE	1	1.7	0.7	1.3	1.5	0.87	1.8	1.4	1.5	8.2	0.41	2.4	1.1	1.8	0.83	0.96	1.3	0.47	0.99	0.62	1.4
Boron	0.2	21	0.4	4.2	0	190000	3.12378826	POTENTIALLY SUITABLE FOR USE	1.6	3.3	0.7	1.3	2.7	1.8	0.8	0.4	2.1	3	0.9	2.8	2.9	3.8	0.6	1.3	4.2	0.6	1.7	0.7	3.9
Cadmium	0.2	21	0.2	0.2	0	220	0.2	POTENTIALLY SUITABLE FOR USE	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Chromium (III)	1	21	17	68	0	8400	48.92722313	POTENTIALLY SUITABLE FOR USE	33	29	23	55	27	17	36	49	47	26	17	38	37	68	32	45	44	17	31	20	55
Chromium (VI)	1.2	21	1.2	1.2	0	33	1.2	POTENTIALLY SUITABLE FOR USE	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Copper	1	21	11	150	0	69000	73.44299534	POTENTIALLY SUITABLE FOR USE	14	110	13	25	110	25	56	20	18	150	11	26	15	33	22	19	32	25	12	23	25
Lead	1	21	6.6	98	0	2330	67.58245813	POTENTIALLY SUITABLE FOR USE	31	98	13	41	62	80	73	39	18	16	6.6	18	13	70	74	70	15	28	17	49	40
Mercury, inorganic	0.3	21	0.3	0.3	0	3600	0.3	POTENTIALLY SUITABLE FOR USE	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Nickel	1	21	4.6	110	0	1700	48.31697526	POTENTIALLY SUITABLE FOR USE	20	44	19	29	27	14	30	30	32	110	13	32	23	34	16	21	34	4.6	22	11	31
Selenium	1	21	1	1.00001	0	13000	1.000002552	POTENTIALLY SUITABLE FOR USE	1.00001	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Vanadium	1	21	23	84	0	9000	68.03784779	POTENTIALLY SUITABLE FOR USE	56	50	40	78	49	29	56	77	69	70	23	56	54	84	46	53	34	25	52	39	49
Zinc	1	21	12	290	0	670000	147.2350628	POTENTIALLY SUITABLE FOR USE	77	290	54	150	140	57	96	99	85	57	26	65	70	120	96	140	72	12	69	45	110
Cyanide (free)	1	21	1	1.000001	0	16000	1.000000255	POTENTIALLY SUITABLE FOR USE	1.000001	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Phenol (total)	1	21	1	1.000001	0	1500	1.000000255	POTENTIALLY SUITABLE FOR USE	1.000001	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Acenaphthene	0.1	21	0.05	1.1	0	97000	0.422334455	POTENTIALLY SUITABLE FOR USE	0.1	1.1	0.1	0.1	0.17	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.65	0.54	0.05	0.05	0.05	0.05	0.05	0.05
Acenaphthylene	0.1	21	0.05	0.81	0	97000	0.26880618	POTENTIALLY SUITABLE FOR USE	0.1	0.21	0.1	0.1	0.19	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.81
Anthracene	0.1	21	0.05	1.5	0	540000	0.75595884	POTENTIALLY SUITABLE FOR USE	0.1	0.81	0.1	0.1	0.63	0.19	0.05	0.05	0.05	0.05	0.05	0.05	0.05	1.5	1.1	0.05	0.05	0.05	0.05	0.27	1.3
Benz(a)anthracene	0.1	21	0.05	3.8	0	91	1.7446007	POTENTIALLY SUITABLE FOR USE	0.1	1.7	0.1	0.27	1.7	0.52	0.29	0.37	0.05	0.05	0.05	0.05	0.05	2.2	2.7	0.52	0.05	0.05	0.05	0.79	3.8
Benzo(a)pyrene	0.1	21	0.05	2.6	0	14	1.279448211	POTENTIALLY SUITABLE FOR USE	0.1	1.4	0.1	0.23	1.2	0.58	0.22	0.58	0.05	0.05	0.05	0.05	0.05	1.6	2	0.47	0.05	0.05	0.05	0.45	2.6
Benzo(b)fluoranthene	0.1	21	0.05	2.7	0	98	1.506214164	POTENTIALLY SUITABLE FOR USE	0.1	2.4	0.1	0.28	2	0.73	0.3	0.53	0.05	0.05	0.05	0.05	0.05	1.6	1.9	0.54	0.05	0.05	0.05	0.56	2.7
Benzo(ghi)perylene	0.05	21	0.05	1.3	0	640	0.772722268	POTENTIALLY SUITABLE FOR USE	0.05	1	0.05	0.05	0.84	0.44	0.05	0.4	0.05	0.05	0.05	0.05	0.05	0.92	1.3	0.31	0.05	0.05	0.05	0.31	1.3
Benzo(k)fluoranthene	0.1	21	0.05	1.6	0	140	0.752508141	POTENTIALLY SUITABLE FOR USE	0.1	0.71	0.1	0.19	0.83	0.38	0.14	0.35	0.05	0.05	0.05	0.05	0.05	1.2	1.6	0.26	0.05	0.05	0.05	0.33	0.66
Chrysene	0.05	21	0.05	2.5	0	140	1.368796203	POTENTIALLY SUITABLE FOR USE	0.05	1.9	0.05	0.21	1.5	0.55	0.27	0.37	0.05	0.05	0.05	0.05	0.05	1.8	2	0.44	0.05	0.05	0.05	0.67	2.5
Dibenz(a,h)anthracene	0.1	21	0.05	0.29	0	12	0.166285079	POTENTIALLY SUITABLE FOR USE	0.1	0.23	0.1	0.1	0.21	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.22	0.05	0.05	0.05	0.05	0.05	0.29
Fluoranthene	0.1	21	0.05	6	0	23000	3.325594349	POTENTIALLY SUITABLE FOR USE	0.1	3.8	0.1	0.45	3.4	1.2	0.5	0.57	0.05	0.17	0.05	0.05	0.05	5.8	6	0.98	0.05	0.05	0.05	1.4	4.7
Fluorene	0.1	21	0.05	0.81	0	68000	0.379309447	POTENTIALLY SUITABLE FOR USE	0.1	0.62	0.1	0.1	0.2	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.81	0.42	0.05	0.05	0.05	0.05	0.05	0.5
Indeno(1,2,3,cd)pyrene	0.1	21	0.05	1.2	0	59	0.704144053	POTENTIALLY SUITABLE FOR USE	0.1	0.95	0.1	0.1	0.73	0.39	0.05	0.35	0.05	0.05	0.05	0.05	0.05	0.91	1.1	0.29	0.05	0.05	0.05	0.24	1.2
Naphthalene	0.05	21	0.05	3.8	0	460	1.13477104	POTENTIALLY SUITABLE FOR USE	0.05	3.8	0.05	0.05	0.65	0.05	0.19	0.05	0.05	1.3	0.05	0.05	0.05	0.14	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Phenanthrene	0.1	21	0.05	8.1	0	22000	3.25764757	POTENTIALLY SUITABLE FOR USE	0.1	2.6	0.1	0.27	1.8	0.65	0.32	0.17	0.05	0.56	0.05	0.05	0.05	5.4	3.9	0.51	0.05	0.05	0.05	1.1	8.1
Pyrene	0.1	21	0.05	7.4	0	54000	3.358109736	POTENTIALLY SUITABLE FOR USE	0.1	3.4	0.1	0.43	2.9	1	0.44	0.52	0.05	0.17	0.05	0.05	0.05	4.6	5.2	0.88	0.05	0.05	0.05	1.2	7.4
Asbestos identified	Y/N								N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Y	N
FOC (dimensionless)	0.001	**(mean)**							0.005	0.019	0.0024	0.0069	0.019	0.0083	0.018	0.011	0.0078	0.058	0.001	0.0057	0.0067	0.0095	0.0089	0.0084	0.02	0.001	0.011	0.0036	0.021
SOM (calculated)	2.07%	**(mean)**							0.86%	3.28%	0.41%	1.19%	3.28%	1.43%	3.10%	1.90%	1.34%	10.00%	0.17%	0.98%	1.16%	1.64%	1.53%	1.45%	3.45%	0.17%	1.90%	0.62%	3.62%
pH (su)	0.0	**(mean)**							8	7.9	7.7	7.8	7.9	8.1	8.1	8.4	8.2	6.8	7.7	8.3	7.7	8	7.7	7.9	7.8	8.4	7.5	7.8	7.9

Risk parameter: Human health - commercial (2.5%SOM)
Data set: RATHVILLY FARM
Client: Ashiled Land
Site: Rail Central
Job no.: C151171
Lab. report no(s).: 17-41138-1, 17-50997-1

Legend: Values in blue are at or below the laboratory reporting limit (where a single value is indicated) and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate.
Values in red are equal to, or greater than, the generic assessment criterion (GAC) or +ve asbestos ID.
MG denotes Made Ground SS denotes Subsoil
NAT denotes natural ground
TS denotes Topsoil

Assessment of Chemicals of Potential Concern to Plant Life

Hydrock

All values in mg/kg unless otherwise stated

Chemical of Potential Concern	Lab. RL	No. Samples	Min. Value	Max. Value	No. Samples > or = GAC	GAC	US_{95}	Result of Significance Test	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG	MG
									TPG066	TPG066	TPG066	TPG068	TPG068	TPG068	WSBL01	WSBL02	WSBL02	WSBL02	WSBL02	WSBL05	WSBL05	WSBL06	WSBL07	WSBL07	WSBL07	WSBL09	WSBL09	WSBL10	WSBL10
									0.5	1.6	2.5	0.5	1	2	0.3	0.3	1.5	2.5	3.5	2.5	3.5	1.2	1.2	2.5	3.5	1.2	3.2	1.5	2.5
Arsenic	1	21	9.8	43	0	250	29.5216	POTENTIALLY SUITABLE FOR USE	23	25	16	34	20	9.8	25	30	28	19	10	17	14	43	29	25	13	16	24	19	13
Boron	0.2	21	0.4	4.2	5	3	3.123788	FURTHER ASSESSMENT REQUIRED	1.6	3.3	0.7	1.3	2.7	1.8	0.8	0.4	2.1	3	0.9	2.8	2.9	3.8	0.6	1.3	4.2	0.6	1.7	0.7	3.9
Chromium (III)	1	21	17	68	0	400	48.92722	POTENTIALLY SUITABLE FOR USE	33	29	23	55	27	17	36	49	47	26	17	38	37	68	32	45	44	17	31	20	55
Chromium (VI)	1.2	21	1.2	1.2	0	25	1.2	POTENTIALLY SUITABLE FOR USE	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Copper	1	21	11	150	1	135	73.443	POTENTIALLY SUITABLE FOR USE	14	110	13	25	110	25	56	20	18	150	11	26	15	33	22	19	32	25	12	23	25
Nickel	1	21	4.6	110	1	75	48.31698	POTENTIALLY SUITABLE FOR USE	20	44	19	29	27	14	30	30	32	110	13	32	23	34	16	21	34	4.6	22	11	31
Zinc	1	21	12	290	0	300	147.2351	POTENTIALLY SUITABLE FOR USE	77	290	54	150	140	57	96	99	85	57	26	65	70	120	96	140	72	12	69	45	110
	Mean																												
pH (su)	0.0								8	7.9	7.7	7.8	7.9	8.1	8.1	8.4	8.2	6.8	7.7	8.3	7.7	8	7.7	7.9	7.8	8.4	7.5	7.8	7.9

Risk parameter: Plant life pH 7
Data set: RATHVILLY FARM
Client: Ashiled Land
Site: Rail Central
Job no.: C151171
Lab. report no(s).: 17-41138-1, 17-50997-1

Legend: Values in blue are at or below the laboratory reporting limit (where a single value is indicated) and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate.
Values in red are equal to, or greater than, the generic assessment criterion (GAC).
MG denotes Made Ground SS denotes Subsoil
NAT denotes natural ground
TS denotes Topsoil

All values in mg/kg unless otherw ise stated

Chemical of Potential Concern	Lab. RL	No. Samples	Min. Value	Max. Value	No. Samples > or = GAC	GAC	US_{95}	Result of Significance Test	Soil Type	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS
									Location & Depth	TPA011	TPA008	TPG056	TPG027	TPG020	TPG028	TPG014	TPR011	TPR008	TPR009	TPR011	TPR010	TPG024	TPR015	TPG025	TPR004	TPRT003	TPRT004	TPRT002	TPRT001	TPG057	TPG058	TPG062	TPG059	TPG063	TPT001
										0.00-0.35	0.00-0.35	0.00-0.30	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.15	0.2	0.25	0.25	0.15	0.2	0.2	0.15	0.2
Arsenic	1	114	3.5	44	0	640	19.17369	POTENTIALLY SUITABLE FOR USE		17	22	44	9.3	20	14	18	13	28	17	18	11	12	12	20	9.8	13	13	9.8	21	16	15	18	8.3	13	28
Beryllium	0.06	114	0.35	2.1	0	390	1.343446	POTENTIALLY SUITABLE FOR USE		1.9	1.8	1.9	0.99	1.5	1	1.1	1.1	1.8	1.3	1.1	1.2	1.2	1.5	1.4	1.1	1.3	1.3	1.5	1.3	1.2	0.89	1.1	0.98	1.1	2
Boron	0.2	114	0.2	3.5	0	190000	1.923145	POTENTIALLY SUITABLE FOR USE		2	1.2	1.5	0.9	2.3	1.6	2.9	2.4	1.9	3.1	1.5	0.9	1.5	1.9	0.3	1.2	2.4	2	1.6	2.1	1.1	0.5	1.8	2.8	1.8	2.3
Cadmium	0.2	114	0.2	0.3	0	220	0.204702	POTENTIALLY SUITABLE FOR USE		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Chromium (ß)	1	114	12	110	0	8400	48.49389	POTENTIALLY SUITABLE FOR USE		71	70	110	35	50	36	45	44	57	47	41	41	49	54	43	40	45	49	53	45	42	31	33	36	40	49
Chromium (VI)	1.2	114	1.2	1.2	0	33	1.2	POTENTIALLY SUITABLE FOR USE		1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Copper	1	114	2.8	52	0	69000	20.97047	POTENTIALLY SUITABLE FOR USE		10	14	6.4	13	17	11	22	12	52	45	10	5.4	10	12	9.6	25	13	12	5.4	8.8	18	10	2.8	6.2	8.7	19
Lead	2	114	13	190	0	2330	44.99459	POTENTIALLY SUITABLE FOR USE		25	47	27	33	87	24	36	22	52	28	20	14	21	14	17	23	23	30	14	25	46	28	26	17	22	120
Mercury, inorganic	0.3	114	0.3	1.9	0	3600	0.702597	POTENTIALLY SUITABLE FOR USE		0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.7	0.7	0.3	0.3	0.3	0.7	0.3	0.3	0.9	0.3	0.3	0.3	0.3	0.4	0.5	0.3	0.3	0.4	0.3
Nickel	2	114	8.1	44	0	1700	23.77507	POTENTIALLY SUITABLE FOR USE		28	32	44	18	22	19	22	20	25	19	20	18	19	24	28	26	23	23	25	22	24	17	20	18	19	31
Selenium	1	114	1	5.7	0	13000	1.71312	POTENTIALLY SUITABLE FOR USE		1	3.3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Vanadium	1	114	23	130	0	9000	66.78517	POTENTIALLY SUITABLE FOR USE		82	92	130	44	72	47	50	43	92	75	51	52	64	42	54	60	58	61	48	57	49	48	56	46	53	80
Zinc	2	114	35	330	0	670000	85.33521	POTENTIALLY SUITABLE FOR USE		92	100	120	78	330	69	120	59	130	88	62	51	71	55	67	72	73	81	56	64	160	54	65	54	59	110
Cyanide (free)	1	114	1	1	0	16000	1	POTENTIALLY SUITABLE FOR USE		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Phenol (total)	2	114	1	1	0	3200	1	POTENTIALLY SUITABLE FOR USE		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Acenaphthene	0.05	114	0.1	0.1	0	100000	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Acenaphthylene	0.05	114	0.1	0.1	0	100000	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Anthracene	0.05	114	0.1	0.1	0	540000	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Benz(a)anthracene	0.05	114	0.1	0.28	0	94	0.108463	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.28	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Benzo(a)pyrene	0.05	114	0.1	0.32	0	14	0.110344	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.32	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Benzo(b)fluoranthene	0.05	114	0.1	0.38	0	99	0.113165	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.38	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Benzo(ghi)perylene	0.05	114	0.05	0.05	0	640	0.05	POTENTIALLY SUITABLE FOR USE		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Benzo(k)fluoranthene	0.05	114	0.1	0.2	0	140	0.104702	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Chrysene	0.05	114	0.05	0.32	0	140	0.063011	POTENTIALLY SUITABLE FOR USE		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.32	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Dibenz(a,h)anthracene	0.05	114	0.1	0.1	0	13	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Fluoranthene	0.05	114	0.1	0.56	0	23000	0.121628	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.56	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Fluorene	0.05	114	0.1	0.1	0	71000	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Indeno(1,2,3-cd)pyrene	0.05	114	0.1	0.1	0	60	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Naphthalene	0.05	114	0.05	0.05	0	1100	0.05	POTENTIALLY SUITABLE FOR USE		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Phenanthrene	0.05	114	0.1	0.1	0	23000	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Pyrene	0.05	114	0.1	0.58	0	55000	0.122568	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.58	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Asbestos identified	Y/N									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
FOC (dimensionless)	0.0206	**(mean)**								0.027	0.036	0.02	0.02	0.026	0.019	0.037	0.023	0.023	0.03	0.02	0.0073	0.027	0.0058	0.01	0.02	0.02	0.024	0.0061	0.021	0.018	0.018	0.012	0.014	0.022	0.025
SOM (calculated)	3.65%	**(mean)**								4.65%	6.21%	3.45%	3.45%	4.48%	3.28%	6.38%	3.97%	3.97%	5.17%	3.45%	1.26%	4.65%	1.00%	1.72%	3.45%	3.45%	4.14%	1.05%	3.62%	3.10%	3.10%	2.07%	2.41%	3.79%	4.31%
pH (su)	7.3	**(mean)**								7.5	7.3	6.9	6.8	7.4	7	7.9	7.9	7.8	7.3	7.8	7.5	7.2	7.9	7.8	7.5	7.6	7.3	8	7.5	8.3	7	7	7.6	7.7	8.3

Risk parameter: Human health - commercial (6%SOM)
Data set: TOPSOIL
Client: Ashfield Land
Site: Rail Central
Job no.: C151171
Lab. report no(s).: 16-27565, 16-28522, 16-29767

Legend: Values in blue are at or below the laboratory reporting limit (w here a single value is indicated) and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate.
Values in red are equal to, or greater than, the generic assessment criterion (GAC).
MG denotes Made Ground
NAT denotes natural ground

All values in mg/kg unless otherw ise stated

Chemical of Potential Concern	Lab. RL	No. Samples	Min. Value	Max. Value	No. Samples > or = GAC	GAC	US_{95}	Result of Significance Test	Soil Type	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS
									Location & Depth	TPT002	TPB003	TPB002	TPG033	TPB013	TPG026	TPB014	TPG013	TPA005	TPA006	TPG052	TPA001	TPA002	TPA003	TPA024	TPA025	TPA028	TPA044	TPG017	TPA041	TPA040	TPA036	TPA037	TPG021	TPRT005	TPRT008	TPRT007	TPB001	TPG035	TPG034	TPG049
										0.3	0.2	0.15	0.15	0.1	0.2	0.15	0.3	0.2	0.15	0.2	0.1	0.25	0.3	0.3	0.1	0.2	0.15	0.1	0.1	0.15	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.1	0.3	0.25	0.1
Arsenic	1	114	3.5	44	0	640	19.17369	POTENTIALLY SUITABLE FOR USE		22	19	14	19	13	20	9.5	7.1	27	29	28	22	15	21	26	32	19	16	16	8.6	11	20	12	16	15	17	17	26	12	19	11
Beryllium	0.06	114	0.35	2.1	0	390	1.343446	POTENTIALLY SUITABLE FOR USE		1.3	1.1	1.4	0.86	1.5	1	1	0.9	1.7	1.6	1.7	1.4	1.1	1.1	1.2	2.1	1.3	1.3	1.1	1	1.4	1.2	1	0.9	1.4	1.3	1.2	1.4	0.78	0.8	1.7
Boron	0.2	114	0.2	3.5	0	190000	1.923145	POTENTIALLY SUITABLE FOR USE		2.8	1.9	3.3	1.1	2.6	2.3	0.7	1.9	3.3	1.3	2.7	2.2	2.1	1	0.5	3	1.7	3	1.4	2.3	2.6	2.5	2.5	1.9	3.2	2.5	2.1	1.3	1	1.3	3.5
Cadmium	0.2	114	0.2	0.3	0	220	0.204702	POTENTIALLY SUITABLE FOR USE		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Chromium (ll)	1	114	12	110	0	8400	48.49389	POTENTIALLY SUITABLE FOR USE		49	35	42	32	52	37	39	37	64	61	65	54	41	39	47	65	38	50	39	38	52	44	38	32	49	51	47	48	30	29	63
Chromium (VI)	1.2	114	1.2	1.2	0	33	1.2	POTENTIALLY SUITABLE FOR USE		1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Copper	1	114	2.8	52	0	69000	20.97047	POTENTIALLY SUITABLE FOR USE		11	17	16	3	16	13	11	11	10	11	12	12	10	6.2	13	32	35	9.9	14	14	16	16	12	7.5	26	21	25	36	18	30	36
Lead	2	114	13	190	0	2330	44.99459	POTENTIALLY SUITABLE FOR USE		27	58	22	20	24	24	20	21	28	31	33	34	27	24	44	80	62	27	26	33	45	25	31	19	33	28	34	33	22	29	41
Mercury, inorganic	0.3	114	0.3	1.9	0	3600	0.702597	POTENTIALLY SUITABLE FOR USE		0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.6	0.8	0.3	0.4	0.6	0.7	0.3	0.3	0.3	0.7	0.8	0.8	0.6	0.4	1.1	0.7	1.9
Nickel	2	114	8.1	44	0	1700	23.77507	POTENTIALLY SUITABLE FOR USE		25	27	30	21	33	22	17	15	29	31	29	25	18	18	25	34	23	20	20	17	20	19	19	15	22	23	22	28	17	18	24
Selenium	1	114	1	5.7	0	13000	1.71312	POTENTIALLY SUITABLE FOR USE		1	1	1	1	1	1	1	1	1	1	1	1	1.5	1	1	1	3.8	1	1	1	1	1	1	1	1	1	4.3	1	1	1.7	2.2
Vanadium	1	114	23	130	0	9000	66.78517	POTENTIALLY SUITABLE FOR USE		68	52	63	56	55	53	50	49	96	95	98	85	67	69	65	88	57	61	48	45	54	50	44	42	63	62	56	82	49	47	73
Zinc	2	114	35	330	0	670000	85.33521	POTENTIALLY SUITABLE FOR USE		79	67	73	67	76	60	59	56	90	98	99	95	70	65	73	120	75	73	70	75	81	69	120	53	66	60	69	74	49	140	79
Cyanide (free)	1	114	1	1	0	16000	1	POTENTIALLY SUITABLE FOR USE		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Phenol (total)	2	114	1	1	0	3200	1	POTENTIALLY SUITABLE FOR USE		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Acenaphthene	0.05	114	0.1	0.1	0	100000	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Acenaphthylene	0.05	114	0.1	0.1	0	100000	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Anthracene	0.05	114	0.1	0.1	0	540000	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Benz(a)anthracene	0.05	114	0.1	0.28	0	94	0.108463	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Benzo(a)pyrene	0.05	114	0.1	0.32	0	14	0.110344	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Benzo(b)fluoranthene	0.05	114	0.1	0.38	0	99	0.113165	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Benzo(ghi)perylene	0.05	114	0.05	0.05	0	640	0.05	POTENTIALLY SUITABLE FOR USE		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Benzo(k)fluoranthene	0.05	114	0.1	0.2	0	140	0.104702	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Chrysene	0.05	114	0.05	0.32	0	140	0.063011	POTENTIALLY SUITABLE FOR USE		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.08	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Dibenz(a,h)anthracene	0.05	114	0.1	0.1	0	13	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Fluoranthene	0.05	114	0.1	0.56	0	23000	0.121628	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Fluorene	0.05	114	0.1	0.1	0	71000	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Indeno(1,2,3-cd)pyrene	0.05	114	0.1	0.1	0	60	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Naphthalene	0.05	114	0.05	0.05	0	1100	0.05	POTENTIALLY SUITABLE FOR USE		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Phenanthrene	0.05	114	0.1	0.1	0	23000	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Pyrene	0.05	114	0.1	0.58	0	55000	0.122568	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Asbestos identified	Y/N									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
FOC (dimensionless)	0.0206	**(mean)**								0.022	0.017	0.014	0.016	0.033	0.023	0.027	0.028	0.027	0.035	0.031	0.028	0.024	0.015	0.013	0.025	0.019	0.026	0.023	0.022	0.028	0.029	0.018	0.023	0.023	0.019	0.027	0.023	0.012	0.022	0.04
SOM (calculated)	3.65%	**(mean)**								3.79%	2.93%	2.41%	2.76%	5.69%	3.97%	4.65%	4.83%	4.65%	6.03%	5.34%	4.83%	4.14%	2.59%	2.24%	4.31%	3.28%	4.48%	3.97%	3.79%	4.83%	5.00%	3.10%	3.97%	3.97%	3.28%	4.65%	3.97%	2.07%	3.79%	6.90%
pH (su)	7.3	**(mean)**								8	7.4	8.2	7.5	7	7.7	7.9	7.5	7.6	7.4	7.2	6	7.4	6.7	7.5	7.8	7.6	7.8	7.1	7.5	7.5	7.9	7.4	6.9	7.5	7.2	6.3	6.4	7.3	7.3	6.2

Risk parameter: Human health - commercial (6%SOM)
Data set: TOPSOIL
Client: Ashfield Land
Site: Rail Central
Job no.: C151171
Lab. report no(s).: 16-27565, 16-28522, 16-29767

All values in mg/kg unless otherw ise stated

Chemical of Potential Concern	Lab. RL	No. Samples	Min. Value	Max. Value	No. Samples > or = GAC	GAC	US_{95}	Result of Significance Test	Soil Type	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS
									Location & Depth	TPO050	TPA029	TPA026	TPA022	TPT004	TPA018	TPA015	TPA027	TPO065	TPA023	TPA019	TPO061	TPA032	TPA016	TPA034	TPO019	TPA035	TPRT006	TPA050	TPA049	TPO045	WSCL001	WSCL002	WSCL003	WSCL004	TPO036	TPO031	TPO032	TPA039
										0.15	0.2	0.15	0.15	0.3	0.1	0.2	0.2	0.15	0.1	0.15	0.15	0.1	0.2	0.3	0.3	0.35	0.2	0	0	0	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2
Arsenic	1	114	3.5	44	0	640	19.17369	POTENTIALLY SUITABLE FOR USE		19	21	27	22	19	27	27	16	16	31	29	21	24	28	9.3	3.5	5.5	6.3	23	18	32	19	9.5	13	10	16	12	8.8	8.7
Beryllium	0.06	114	0.35	2.1	0	390	1.343446	POTENTIALLY SUITABLE FOR USE		1.4	1.2	1.2	1.4	1.2	1.6	1.7	0.81	0.93	1.3	1.6	1.2	1.7	1.5	1.2	1.1	1.4	1.3	1.5	1.4	1.7	1.1	1.1	0.83	1	0.66	0.8	0.76	1.2
Boron	0.2	114	0.2	3.5	0	190000	1.923145	POTENTIALLY SUITABLE FOR USE		1.8	1.1	1	1	0.5	2.2	3	1	0.9	0.9	1.9	1.9	3.3	2.3	2.3	1	1.7	1.6	1.5	2.3	1.3	1.2	1.2	1.6	1.7	0.8	0.6	0.5	0.9
Cadmium	0.2	114	0.2	0.3	0	220	0.204702	POTENTIALLY SUITABLE FOR USE		0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Chromium (ⅲ)	1	114	12	110	0	8400	48.49389	POTENTIALLY SUITABLE FOR USE		55	41	41	51	41	60	87	26	32	48	51	48	58	52	46	47	57	50	29	37	57	42	45	38	38	22	29	23	38
Chromium (VI)	1.2	114	1.2	1.2	0	33	1.2	POTENTIALLY SUITABLE FOR USE		1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Copper	1	114	2.8	52	0	69000	20.97047	POTENTIALLY SUITABLE FOR USE		32	33	28	20	14	26	23	24	24	17	21	19	21	26	13	12	16	15	35	33	20	24	14	16	15	17	20	17
Lead	2	114	13	190	0	2330	44.99459	POTENTIALLY SUITABLE FOR USE		52	86	64	39	21	33	37	130	49	39	30	26	29	33	18	13	16	15	110	69	190	22	24	25	19	32	36	38	21
Mercury, inorganic	0.3	114	0.3	1.9	0	3600	0.702597	POTENTIALLY SUITABLE FOR USE		1.3	1.8	1	1.1	0.3	1.3	1.1	0.7	1.1	0.8	1	1.2	0.8	1.1	1.8	1.1	1.7	0.3	1	1	0.7	0.7	0.7	0.7	0.4	0.6	0.7	0.8	0.3
Nickel	2	114	8.1	44	0	1700	23.77507	POTENTIALLY SUITABLE FOR USE		24	20	23	25	23	40	38	17	19	24	37	23	28	34	19	16	20	22	21	25	33	18	19	18	16	13	16	14	21
Selenium	1	114	1	5.7	0	13000	1.71312	POTENTIALLY SUITABLE FOR USE		1.3	1	1	1	1	1.1	1	3.3	1.7	1.7	3.2	4.1	1.9	1	3.7	1	1.4	1	1	1	1.8	3.2	1.4	1.9	1	1.5	1.1	1.8	1
Vanadium	1	114	23	130	0	9000	66.78517	POTENTIALLY SUITABLE FOR USE		76	62	58	79	79	77	88	44	51	79	72	63	78	60	50	47	54	49	46	75	82	51	51	55	55	33	50	37	59
Zinc	2	114	35	330	0	670000	85.33521	POTENTIALLY SUITABLE FOR USE		74	69	66	87	69	71	94	69	65	81	66	61	73	70	51	49	62	50	72	98	81	55	53	68	68	48	67	61	59
Cyanide (free)	1	114	1	1	0	16000	1	POTENTIALLY SUITABLE FOR USE		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Phenol (total)	2	114	1	1	0	3200	1	POTENTIALLY SUITABLE FOR USE		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Acenaphthene	0.05	114	0.1	0.1	0	100000	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Acenaphthylene	0.05	114	0.1	0.1	0	100000	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Anthracene	0.05	114	0.1	0.1	0	540000	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Benz(a)anthracene	0.05	114	0.1	0.28	0	94	0.108463	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Benzo(a)pyrene	0.05	114	0.1	0.32	0	14	0.110344	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Benzo(b)fluoranthene	0.05	114	0.1	0.38	0	99	0.113165	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Benzo(ghi)perylene	0.05	114	0.05	0.05	0	640	0.05	POTENTIALLY SUITABLE FOR USE		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Benzo(k)fluoranthene	0.05	114	0.1	0.2	0	140	0.104702	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Chrysene	0.05	114	0.05	0.32	0	140	0.063011	POTENTIALLY SUITABLE FOR USE		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Dibenz(a,h)anthracene	0.05	114	0.1	0.1	0	13	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Fluoranthene	0.05	114	0.1	0.56	0	23000	0.121628	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Fluorene	0.05	114	0.1	0.1	0	71000	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Indeno(1,2,3-cd)pyrene	0.05	114	0.1	0.1	0	60	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Naphthalene	0.05	114	0.05	0.05	0	1100	0.05	POTENTIALLY SUITABLE FOR USE		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Phenanthrene	0.05	114	0.1	0.1	0	23000	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Pyrene	0.05	114	0.1	0.58	0	65000	0.122568	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Asbestos identified	Y/N									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
FOC (dimensionless)	0.0206	**(mean)**								0.024	0.023	0.02	0.019	0.0044	0.027	0.036	0.021	0.021	0.019	0.027	0.027	0.036	0.033	0.0048	0.0039	0.0073	0.0043	0.031	0.026	0.025	0.021	0.026	0.023	0.02	0.0094	0.012	0.013	0.013
SOM (calculated)	3.65%	**(mean)**								4.14%	3.97%	3.45%	3.28%	0.76%	4.65%	6.21%	3.62%	3.62%	3.28%	4.65%	4.65%	6.21%	5.69%	0.83%	0.67%	1.26%	0.74%	5.34%	4.48%	4.31%	3.62%	4.48%	3.97%	3.45%	1.62%	2.07%	2.24%	2.24%
pH (su)	7.3	**(mean)**								6.4	7.2	7.1	7.2	7.2	6.6	6.5	7.2	7.1	7	7.1	6.6	7.7	6.7	7.9	7.5	7	7.5	7.4	7.5	7.7	7.1	7.6	7.7	7.3	7.4	6.6	7.1	6.6

Risk parameter: Human health - commercial (6%SOM)
Data set: TOPSOIL
Client: Ashfield Land
Site: Rail Central
Job no.: C151171
Lab. report no(s).: 16-27565, 16-28522, 16-29767

All values in mg/kg unless otherw ise stated

Chemical of Potential Concern	Lab. RL	No. Samples	Min. Value	Max. Value	No. Samples > or = GAC	GAC	US_{95}	Result of Significance Test	Soil Type	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS
									Location & Depth	TP0018	TP0008	TPA043	TPA038	TPG006	TPA042	TPG022	TPG015	TP0012	TPG005	TPG046	TPG051	TPG010	TPG023	TPA048	TPG044	TPA046	TPA049	TPG016	TPG038	TPG042	TPG039	TPG040
										0.2	0.3	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.00-0.30	0.3	0.3	0.00-0.30	0.00-0.30	0.2	0.2	0.3	0.00-0.30	0.00-0.30	0.00-0.30	0.3	0.00-0.30
Arsenic	1	114	3.5	44	0	640	19.17369	POTENTIALLY SUITABLE FOR USE		11	5.5	13	12	18	14	11	7.1	6.8	8	8.9	12	8.5	12	14	22	8.6	20	9	4.2	7.5	11	11	17
Beryllium	0.06	114	0.35	2.1	0	390	1.343446	POTENTIALLY SUITABLE FOR USE		1.5	0.94	1.6	1	1.5	1.3	0.94	0.97	0.97	1.3	1.1	0.99	0.87	1	0.84	0.91	0.88	1.3	1.4	0.35	0.53	0.52	0.67	0.6
Boron	0.2	114	0.2	3.5	0	190000	1.923145	POTENTIALLY SUITABLE FOR USE		2.3	1.5	1.9	1	0.6	0.9	1.2	1.1	0.8	0.9	1.5	0.8	1	1	0.7	0.8	0.9	1	0.9	0.4	0.6	0.3	0.6	0.3
Cadmium	0.2	114	0.2	0.3	0	220	0.204702	POTENTIALLY SUITABLE FOR USE		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Chromium (ⅲ)	1	114	12	110	0	8400	48.49389	POTENTIALLY SUITABLE FOR USE		42	34	52	36	51	40	29	35	35	40	36	34	31	32	26	29	31	40	37	12	18	20	24	18
Chromium (VI)	1.2	114	1.2	1.2	0	33	1.2	POTENTIALLY SUITABLE FOR USE		1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Copper	1	114	2.8	52	0	69000	20.97047	POTENTIALLY SUITABLE FOR USE		21	17	17	15	18	9.9	16	20	17	24	24	17	20	16	15	18	15	17	15	12	15	11	17
Lead	2	114	13	190	0	2330	44.99459	POTENTIALLY SUITABLE FOR USE		33	23	29	19	21	16	20	23	22	28	27	27	21	22	23	49	20	23	24	31	27	18	93
Mercury, inorganic	0.3	114	0.3	1.9	0	3600	0.702597	POTENTIALLY SUITABLE FOR USE		0.3	0.3	0.3	0.6	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Nickel	2	114	8.1	44	0	1700	23.77507	POTENTIALLY SUITABLE FOR USE		21	15	20	16	21	14	14	15	16	16	16	16	14	16	15	20	13	16	18	8.1	12	12	13
Selenium	1	114	1	5.7	0	13000	1.71312	POTENTIALLY SUITABLE FOR USE		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	5.7	1
Vanadium	1	114	23	130	0	9000	66.78517	POTENTIALLY SUITABLE FOR USE		78	52	86	53	94	64	43	42	40	56	55	64	38	39	40	58	43	72	64	23	33	36	43
Zinc	2	114	35	330	0	670000	85.33521	POTENTIALLY SUITABLE FOR USE		72	55	68	52	72	49	46	51	47	54	62	59	49	49	52	75	42	60	58	35	42	39	53
Cyanide (free)	1	114	1	1	0	16000	1	POTENTIALLY SUITABLE FOR USE		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Phenol (total)	2	114	1	1	0	3200	1	POTENTIALLY SUITABLE FOR USE		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Acenaphthene	0.05	114	0.1	0.1	0	100000	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Acenaphthylene	0.05	114	0.1	0.1	0	100000	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Anthracene	0.05	114	0.1	0.1	0	540000	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Benz(a)anthracene	0.05	114	0.1	0.28	0	94	0.108463	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Benzo(a)pyrene	0.05	114	0.1	0.32	0	14	0.110344	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Benzo(b)fluoranthene	0.05	114	0.1	0.38	0	99	0.113165	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Benzo(ghi)perylene	0.05	114	0.05	0.05	0	640	0.05	POTENTIALLY SUITABLE FOR USE		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Benzo(k)fluoranthene	0.05	114	0.1	0.2	0	140	0.104702	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Chrysene	0.05	114	0.05	0.32	0	140	0.063011	POTENTIALLY SUITABLE FOR USE		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Dibenz(a,h)anthracene	0.05	114	0.1	0.1	0	13	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Fluoranthene	0.05	114	0.1	0.56	0	23000	0.121628	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Fluorene	0.05	114	0.1	0.1	0	71000	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Indeno(1,2,3-cd)pyrene	0.05	114	0.1	0.1	0	60	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Naphthalene	0.05	114	0.05	0.05	0	1100	0.05	POTENTIALLY SUITABLE FOR USE		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Phenanthrene	0.05	114	0.1	0.1	0	23000	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Pyrene	0.05	114	0.1	0.58	0	55000	0.122568	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Asbestos identified	Y/N									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
FOC (dimensionless)	0.0206B	**(mean)**								0.023	0.023	0.03	0.014	0.014	0.017	0.018	0.02	0.017	0.018	0.021	0.016	0.017	0.016	0.02	0.02	0.018	0.023	0.013	0.018	0.013	0.0091	0.02
SOM (calculated)	3.65%	**(mean)**								3.97%	3.97%	5.17%	2.41%	2.41%	2.93%	3.10%	3.45%	2.93%	3.10%													
pH (su)	7.3	**(mean)**								8	7	7.1	7.5	7.2	7	7.7	7.6	7.3	7.4	7.7	7.3	7.1	7.7	6.1	6.6	7.4	7.7	7.6	6.5	6.3	6.4	6.9

Chemical of Potential Concern	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS
Location & Depth	TP0008	TPA043	TPA038	TPG006	TPA042	TPG022	TPG015	TP0012	TPG005	TPG046	TPG051	TPG010	TPG023	TPA048	TPG044	TPA046	TPA049	TPG016	TPG038	TPG042	TPG039	TPG040	TPG029	TPG030	TPG037	TPG041	TPG009				
	0.3	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.00-0.30	0.3	0.3	0.2	0.00-0.30	0.00-0.30	0.2	0.2	0.3	0.00-0.30	0.00-0.30	0.00-0.30	0.3	0.00-0.30	0.00-0.30	0.00-0.30	0.00-0.20	0.3				
Arsenic	5.5	13	12	18	14	11	7.1	6.8	8	8.9	12	8.5	12	14	22	8.6	20	9	4.2	7.5	11	11	17	14	13	7.9	22				
Beryllium	0.94	1.6	1	1.5	1.3	0.94	0.97	0.97	1.3	1.1	0.99	0.87	1	0.84	0.91	0.88	1.3	1.4	0.35	0.53	0.52	0.67	0.6	0.55	1.2	0.39	1.9				
Boron	1.5	1.9	1	0.6	0.9	1.2	1.1	0.8	0.9	1.5	0.8	1	1	0.7	0.8	0.9	1	0.9	0.4	0.6	0.3	0.6	0.3	0.2	2.1	0.5	1.7				
Cadmium	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2				
Chromium (ⅲ)	34	52	36	51	40	29	35	35	40	36	34	31	32	26	29	31	40	37	12	18	20	24	18	22	37	13	67				
Chromium (VI)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2				
Copper	17	17	15	18	9.9	16	20	17	24	24	17	20	16	15	18	15	17	15	12	15	11	17	10	12	27	10	22				
Lead	23	29	19	21	16	20	23	22	28	27	27	21	22	23	49	20	23	24	31	27	18	93	20	22	47	23	28				
Mercury, inorganic	0.3	0.3	0.6	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	1.4	0.3	0.3				
Nickel	15	20	16	21	14	14	15	16	16	16	16	14	16	15	20	13	16	18	8.1	12	12	13	11	12	18	8.7	24				
Selenium	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	5.7	1	1	1	1	5.6	1				
Vanadium	52	86	53	94	64	43	42	40	56	55	64	38	39	40	58	43	72	64	23	33	36	43	44	41	48	25	100				
Zinc	55	68	52	72	49	46	51	47	54	62	59	49	49	52	75	42	60	58	35	42	39	53	45	40	72	35	86				
Cyanide (free)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1				
Phenol (total)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1				
Acenaphthene	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1				
Acenaphthylene	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1				
Anthracene	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1				
Benz(a)anthracene	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1				
Benzo(a)pyrene	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1				
Benzo(b)fluoranthene	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1				
Benzo(ghi)perylene	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05				
Benzo(k)fluoranthene	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1				
Chrysene	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05				
Dibenz(a,h)anthracene	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1				
Fluoranthene	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1				
Fluorene	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1				
Indeno(1,2,3-cd)pyrene	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1				
Naphthalene	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05				
Phenanthrene	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1				
Pyrene	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1				
Asbestos identified	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N				
FOC (dimensionless)	0.023	0.03	0.014	0.014	0.017	0.018	0.02	0.017	0.018	0.021	0.016	0.017	0.016	0.02	0.02	0.018	0.023	0.013	0.018	0.013	0.0091	0.02	0.018	0.012	0.031	0.015	0.023				
SOM (calculated)	3.97%	5.17%	2.41%	2.41%	2.93%	3.10%	3.45%	2.93%	3.10%																						
pH (su)	8	7.1	7.5	7.2	7	7.7	7.6	7.3	7.4	7.7	7.3	7.1	7.7	6.1	6.6	7.4	7.7	7.6	6.5	6.3	6.4	6.9	6.2	6.2	5.7	6	7.6				

Risk parameter: Human health - commercial (6%SOM)
Data set: TOPSOIL
Client: Ashfield Land
Site: Rail Central
Job no.: C151171
Lab. report no(s).: 16-27565, 16-28522, 16-29767

Assessment of Chemicals of Potential Concern to Plant Life

Hydrock

All values in mg/kg unless otherwise stated								Soil Type	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS
								Location & Depth	TPA011	TPA008	TPG056	TPG027	TPG020	TPG028	TPG014	TPR011	TPR008	TPR009	TPR011	TPR010	TPG024	TPR015	TPG025
Chemical of Potential Concern	**Lab. RL**	**No. Samples**	**Min. Value**	**Max. Value**	**No. Samples > or = GAC**	**GAC**	**US_{95}**	**Result of Significance Test**	**0.00-0.35**	**0.00-0.35**	**0.00-0.30**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
Arsenic	1	114	3.5	44	0	250	19.17369	POTENTIALLY SUITABLE FOR USE	17	22	44	9.3	20	14	18	13	28	17	18	11	12	12	20
Boron	0.2	114	0.2	3.5	9	3	1.923145	POTENTIALLY SUITABLE FOR USE	2	1.2	1.5	0.9	2.3	1.6	2.9	2.4	1.9	3.1	1.5	0.9	1.5	1.9	0.3
Chromium (III)	1	114	12	110	0	400	48.49389	POTENTIALLY SUITABLE FOR USE	71	70	110	35	50	36	45	44	57	47	41	41	49	54	43
Chromium (VI)	1.2	114	1.2	1.2	0	25	1.2	POTENTIALLY SUITABLE FOR USE	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Copper	1	114	2.8	52	0	135	20.97047	POTENTIALLY SUITABLE FOR USE	10	14	6.4	13	17	11	22	12	52	45	10	5.4	10	12	9.6
Nickel	2	114	8.1	44	0	75	23.77507	POTENTIALLY SUITABLE FOR USE	28	32	44	18	22	19	22	20	25	19	20	18	19	24	28
Zinc	2	114	35	330	1	300	85.33521	POTENTIALLY SUITABLE FOR USE	92	100	120	78	330	69	120	59	130	88	62	51	71	55	67
	Mean																						
pH (su)	7.3								7.5	7.3	6.9	6.8	7.4	7	7.9	7.9	7.8	7.3	7.8	7.5	7.2	7.9	7.8

Risk parameter: **Plant life pH 7**
Data set: TOPSOIL
Client: Ashfield Land
Site: Rail Central
Job no.: C151171
Lab. report no(s).: 16-27565, 16-28522, 16-29767

Legend: Values in blue are at or below the laboratory reporting limit (where a single value is indicated) and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate.
Values in red are equal to, or greater than, the generic assessment criterion (GAC).
MG denotes Made Ground
NAT denotes natural ground

Assessment of Chemicals of Potential Concern to Plant Life

Hydrock

All values in mg/kg unless otherwise stated								Soil Type	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS
								Location & Depth	TPR004	TPRT003	TPRT004	TPRT002	TPRT001	TPG057	TPG058	TPG062	TPG059	TPG063	TPT001	TPT002	TPR003	TPR002	TPG033	TPR013	TPG026	TPR014	TPG013	TPA005
Chemical of Potential Concern	**Lab. RL**	**No. Samples**	**Min. Value**	**Max. Value**	**No. Samples > or = GAC**	**GAC**	**US_{95}**	**Result of Significance Test**	**0.2**	**0.2**	**0.15**	**0.2**	**0.25**	**0.25**	**0.15**	**0.2**	**0.2**	**0.15**	**0.2**	**0.3**	**0.2**	**0.15**	**0.15**	**0.1**	**0.2**	**0.15**	**0.3**	**0.2**
Arsenic	1	114	3.5	44	0	250	19.17369	POTENTIALLY SUITABLE FOR USE	9.8	13	13	9.8	21	16	15	18	8.3	13	28	22	19	14	19	13	20	9.5	7.1	27
Boron	0.2	114	0.2	3.5	9	3	1.923145	POTENTIALLY SUITABLE FOR USE	1.2	2.4	2	1.6	2.1	1.1	0.5	1.8	2.8	1.8	2.3	2.8	1.9	3.3	1.1	2.6	2.3	0.7	1.9	3.3
Chromium (III)	1	114	12	110	0	400	48.49389	POTENTIALLY SUITABLE FOR USE	40	45	49	53	45	42	31	33	36	40	49	49	35	42	32	52	37	39	37	64
Chromium (VI)	1.2	114	1.2	1.2	0	25	1.2	POTENTIALLY SUITABLE FOR USE	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Copper	1	114	2.8	52	0	135	20.97047	POTENTIALLY SUITABLE FOR USE	25	13	12	5.4	8.8	18	10	2.8	6.2	8.7	19	11	17	16	3	16	13	11	11	10
Nickel	2	114	8.1	44	0	75	23.77507	POTENTIALLY SUITABLE FOR USE	26	23	23	25	22	24	17	20	18	19	31	25	27	30	21	33	22	17	15	29
Zinc	2	114	35	330	1	300	85.33521	POTENTIALLY SUITABLE FOR USE	72	73	81	56	64	160	54	65	54	59	110	79	67	73	67	76	60	59	56	90
	Mean																											
pH (su)	7.3								7.5	7.6	7.3	8	7.5	8.3	7	7	7.6	7.7	8.3	8	7.4	8.2	7.5	7	7.7	7.9	7.5	7.6

Risk parameter: **Plant life pH 7**
Data set: TOPSOIL
Client: Ashfield Land
Site: Rail Central
Job no.: C151171
Lab. report no(s).: 16-27565, 16-28522, 16-29767

Assessment of Chemicals of Potential Concern to Plant Life

Hydrock

All values in mg/kg unless otherwise stated								Soil Type	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS
								Location & Depth	TPA006	TPG052	TPA001	TPA002	TPA003	TPA024	TPA025	TPA028	TPA044	TPG017	TPA041	TPA040	TPA036	TPA037	TPG021	TPRT005	TPRT008
Chemical of Potential Concern	**Lab. RL**	**No. Samples**	**Min. Value**	**Max. Value**	**No. Samples > or = GAC**	**GAC**	**US_{95}**	**Result of Significance Test**	**0.15**	**0.2**	**0.1**	**0.25**	**0.3**	**0.3**	**0.1**	**0.2**	**0.15**	**0.1**	**0.1**	**0.15**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**
Arsenic	1	114	3.5	44	0	250	19.17369	POTENTIALLY SUITABLE FOR USE	29	28	22	15	21	26	32	19	16	16	8.6	11	20	12	16	15	17
Boron	0.2	114	0.2	3.5	9	3	1.923145	POTENTIALLY SUITABLE FOR USE	1.3	2.7	2.2	2.1	1	0.5	3	1.7	3	1.4	2.3	2.6	2.5	2.5	1.9	3.2	2.5
Chromium (III)	1	114	12	110	0	400	48.49389	POTENTIALLY SUITABLE FOR USE	61	65	54	41	39	47	65	38	50	39	38	52	44	38	32	49	51
Chromium (VI)	1.2	114	1.2	1.2	0	25	1.2	POTENTIALLY SUITABLE FOR USE	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Copper	1	114	2.8	52	0	135	20.97047	POTENTIALLY SUITABLE FOR USE	11	12	12	10	6.2	13	32	35	9.9	14	14	16	16	12	7.5	26	21
Nickel	2	114	8.1	44	0	75	23.77507	POTENTIALLY SUITABLE FOR USE	31	29	25	18	18	25	34	23	20	20	17	20	19	19	15	22	23
Zinc	2	114	35	330	1	300	85.33521	POTENTIALLY SUITABLE FOR USE	98	99	95	70	65	73	120	75	73	70	75	81	69	120	53	66	60
	Mean																								
pH (su)	7.3								7.4	7.2	6	7.4	6.7	7.5	7.8	7.6	7.8	7.1	7.5	7.5	7.9	7.4	6.9	7.5	7.2

Risk parameter: **Plant life pH 7**
Data set: TOPSOIL
Client: Ashfield Land
Site: Rail Central
Job no.: C151171
Lab. report no(s).: 16-27565, 16-28522, 16-29767

Assessment of Chemicals of Potential Concern to Plant Life

Hydrock

All values in mg/kg unless otherwise stated								Soil Type	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS
								Location & Depth	TPRT007	TPR001	TPG035	TPG034	TPG049	TPG050	TPA029	TPA026	TPA022	TPT004	TPA018	TPA015	TPA027	TPG065	TPA023	TPA019	TPG061	TPA032
Chemical of Potential Concern	**Lab. RL**	**No. Samples**	**Min. Value**	**Max. Value**	**No. Samples > or = GAC**	**GAC**	**US_{95}**	**Result of Significance Test**	**0.3**	**0.1**	**0.3**	**0.25**	**0.1**	**0.15**	**0.2**	**0.15**	**0.15**	**0.3**	**0.1**	**0.2**	**0.2**	**0.15**	**0.1**	**0.15**	**0.15**	**0.1**
Arsenic	1	114	3.5	44	0	250	19.17369	POTENTIALLY SUITABLE FOR USE	17	26	12	19	11	19	21	27	22	19	27	27	16	16	31	29	21	24
Boron	0.2	114	0.2	3.5	9	3	1.923145	POTENTIALLY SUITABLE FOR USE	2.1	1.3	1	1.3	3.5	1.8	1.1	1	1	0.5	2.2	3	1	0.9	0.9	1.9	1.9	3.3
Chromium (III)	1	114	12	110	0	400	48.49389	POTENTIALLY SUITABLE FOR USE	47	48	30	29	63	55	41	41	51	41	60	87	26	32	48	51	48	58
Chromium (VI)	1.2	114	1.2	1.2	0	25	1.2	POTENTIALLY SUITABLE FOR USE	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Copper	1	114	2.8	52	0	135	20.97047	POTENTIALLY SUITABLE FOR USE	25	36	18	30	36	32	33	28	20	14	26	23	24	24	17	21	19	21
Nickel	2	114	8.1	44	0	75	23.77507	POTENTIALLY SUITABLE FOR USE	22	28	17	18	24	24	20	23	25	23	40	38	17	19	24	37	23	28
Zinc	2	114	35	330	1	300	85.33521	POTENTIALLY SUITABLE FOR USE	69	74	49	140	79	74	69	66	87	69	71	94	69	65	81	66	61	73
	Mean																									
pH (su)	7.3								6.3	6.4	7.3	7.3	6.2	6.4	7.2	7.1	7.2	7.2	6.6	6.5	7.2	7.1	7	7.1	6.6	7.7

Risk parameter: **Plant life pH 7**
Data set: TOPSOIL
Client: Ashfield Land
Site: Rail Central
Job no.: C151171
Lab. report no(s).: 16-27565, 16-28522, 16-29767

Assessment of Chemicals of Potential Concern to Plant Life

Hydrock

All values in mg/kg unless otherwise stated								Soil Type	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS
								Location & Depth	TPA016	TPA034	TPG019	TPA035	TPRT006	TPA050	TPA049	TPG045	WSCL001	WSCL002	WSCL003	WSCL004	TPG036	TPG031	TPG032	TPA039
Chemical of Potential Concern	**Lab. RL**	**No. Samples**	**Min. Value**	**Max. Value**	**No. Samples > or = GAC**	**GAC**	**US_{95}**	**Result of Significance Test**	**0.2**	**0.3**	**0.3**	**0.35**	**0.2**	**0**	**0**	**0**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.2**	**0.2**	**0.2**
Arsenic	1	114	3.5	44	0	250	19.17369	POTENTIALLY SUITABLE FOR USE	28	9.3	3.5	5.5	6.3	23	18	32	19	9.5	13	10	16	12	8.8	8.7
Boron	0.2	114	0.2	3.5	9	3	1.923145	POTENTIALLY SUITABLE FOR USE	2.3	2.3	1	1.7	1.6	1.5	2.3	1.3	1.2	1.2	1.6	1.7	0.8	0.6	0.5	0.9
Chromium (III)	1	114	12	110	0	400	48.49389	POTENTIALLY SUITABLE FOR USE	52	46	47	57	50	29	37	57	42	45	38	38	22	29	23	38
Chromium (VI)	1.2	114	1.2	1.2	0	25	1.2	POTENTIALLY SUITABLE FOR USE	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Copper	1	114	2.8	52	0	135	20.97047	POTENTIALLY SUITABLE FOR USE	26	13	12	16	15	35	33	33	20	24	14	16	15	17	20	17
Nickel	2	114	8.1	44	0	75	23.77507	POTENTIALLY SUITABLE FOR USE	34	19	16	20	22	21	25	33	18	19	18	16	13	16	14	21
Zinc	2	114	35	330	1	300	85.33521	POTENTIALLY SUITABLE FOR USE	70	51	49	62	50	72	98	81	55	53	68	68	48	67	61	59
	Mean																							
pH (su)	7.3								6.7	7.9	7.5	7	7.5	7.4	7.5	7.7	7.1	7.6	7.7	7.3	7.4	6.6	7.1	6.6

Risk parameter: **Plant life pH 7**
Data set: TOPSOIL
Client: Ashfield Land
Site: Rail Central
Job no.: C151171
Lab. report no(s).: 16-27565, 16-28522, 16-29767

Assessment of Chemicals of Potential Concern to Plant Life

Hydrock

All values in mg/kg unless otherwise stated								Soil Type	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS
								Location & Depth	TPG018	TPG008	TPA043	TPA038	TPG006	TPA042	TPG022	TPG015	TPR012	TPG005	TPG046	TPG051	TPG010	TPG023
Chemical of Potential Concern	**Lab. RL**	**No. Samples**	**Min. Value**	**Max. Value**	**No. Samples > or = GAC**	**GAC**	**US_{95}**	**Result of Significance Test**	**0.2**	**0.3**	**0.2**	**0.2**	**0.2**	**0.3**	**0.2**	**0.3**	**0.2**	**0.2**	**0.00-0.30**	**0.3**	**0.3**	**0.2**
Arsenic	1	114	3.5	44	0	250	19.17369	POTENTIALLY SUITABLE FOR USE	11	5.5	13	12	18	14	11	7.1	6.8	8	8.9	12	8.5	12
Boron	0.2	114	0.2	3.5	9	3	1.923145	POTENTIALLY SUITABLE FOR USE	2.3	1.5	1.9	1	0.6	0.9	1.2	1.1	0.8	0.9	1.5	0.8	1	1
Chromium (III)	1	114	12	110	0	400	48.49389	POTENTIALLY SUITABLE FOR USE	42	34	52	36	51	40	29	35	35	40	36	34	31	32
Chromium (VI)	1.2	114	1.2	1.2	0	25	1.2	POTENTIALLY SUITABLE FOR USE	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Copper	1	114	2.8	52	0	135	20.97047	POTENTIALLY SUITABLE FOR USE	21	17	17	15	18	9.9	16	20	17	24	24	17	20	16
Nickel	2	114	8.1	44	0	75	23.77507	POTENTIALLY SUITABLE FOR USE	21	15	20	16	21	14	14	15	16	16	16	16	14	16
Zinc	2	114	35	330	1	300	85.33521	POTENTIALLY SUITABLE FOR USE	72	55	68	52	72	49	46	51	47	54	62	59	49	49
	Mean																					
pH (su)	7.3								8	7	7.1	7.5	7.2	7	7.7	7.6	7.3	7.4	7.7	7.3	7.1	7.7

Risk parameter: **Plant life pH 7**
Data set: TOPSOIL
Client: Ashfield Land
Site: Rail Central
Job no.: C151171
Lab. report no(s).: 16-27565, 16-28522, 16-29767

Assessment of Chemicals of Potential Concern to Plant Life

Hydrock

All values in mg/kg unless otherwise stated								Soil Type	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS
								Location & Depth	TPA048	TPG044	TPA046	TPA049	TPG016	TPG038	TPG042	TPG039	TPG040	TPG029	TPG030	TPG037	TPG041	TPG009
Chemical of Potential Concern	**Lab. RL**	**No. Samples**	**Min. Value**	**Max. Value**	**No. Samples > or = GAC**	**GAC**	**US_{95}**	**Result of Significance Test**	**0.00-0.30**	**0.00-0.30**	**0.2**	**0.2**	**0.3**	**0.00-0.30**	**0.00-0.30**	**0.00-0.30**	**0.3**	**0.00-0.30**	**0.00-0.30**	**0.00-0.30**	**0.00-0.20**	**0.3**
Arsenic	1	114	3.5	44	0	250	19.17369	POTENTIALLY SUITABLE FOR USE	14	22	8.6	20	9	4.2	7.5	11	11	17	14	13	7.9	22
Boron	0.2	114	0.2	3.5	9	3	1.923145	POTENTIALLY SUITABLE FOR USE	0.7	0.8	0.9	1	0.9	0.4	0.6	0.3	0.6	0.3	0.2	2.1	0.5	1.7
Chromium (III)	1	114	12	110	0	400	48.49389	POTENTIALLY SUITABLE FOR USE	26	29	31	40	37	12	18	20	24	18	22	37	13	67
Chromium (VI)	1.2	114	1.2	1.2	0	25	1.2	POTENTIALLY SUITABLE FOR USE	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Copper	1	114	2.8	52	0	135	20.97047	POTENTIALLY SUITABLE FOR USE	15	18	15	17	15	12	15	11	17	10	12	27	10	22
Nickel	2	114	8.1	44	0	75	23.77507	POTENTIALLY SUITABLE FOR USE	15	20	13	16	18	8.1	12	12	13	11	12	18	8.7	24
Zinc	2	114	35	330	1	300	85.33521	POTENTIALLY SUITABLE FOR USE	52	75	42	60	58	35	42	39	53	45	40	72	35	86
	Mean																					
pH (su)	7.3								6.1	6.6	7.4	7.7	7.6	6.5	6.3	6.4	6.9	6.2	6.2	5.7	6	7.6

Risk parameter: **Plant life pH 7**
Data set: TOPSOIL
Client: Ashfield Land
Site: Rail Central
Job no.: C151171
Lab. report no(s).: 16-27565, 16-28522, 16-29767

Assessment of Chemicals of Potential Concern to Human Health

Hydrock

All values in mg/kg unless otherwise stated

Chemical of Potential Concern	Lab. RL	No. Samples	Min. Value	Max. Value	No. Samples > or = GAC	GAC	US_{95}	Result of Significance Test	Soil Type	MG	WMS	MG	WMS	MG	MG
									Location & Depth	WSS07	WSS05	WSS06	WSS02	WSS01	WSS04
										0.3	1.25	0.4	1.3	0.3	0.35
Arsenic	1	6	1.7	15	0	640	16.931715	POTENTIALLY SUITABLE FOR USE		13	1.7	3.7	15	2.8	3.6
Beryllium	0.06	6	0.06	1.2	0	390	1.4268071	POTENTIALLY SUITABLE FOR USE		0.06	1.1	0.06	1.2	0.06	0.06
Boron	0.2	6	0.2	0.9	0	190000	1.1163323	POTENTIALLY SUITABLE FOR USE		0.5	0.7	0.9	0.9	0.2	0.3
Cadmium	0.2	6	0.2	0.2	0	220	0.2	POTENTIALLY SUITABLE FOR USE		0.2	0.2	0.2	0.2	0.2	0.2
Chromium (III)	1	6	6	38	0	8400	44.85617	POTENTIALLY SUITABLE FOR USE		11	38	14	37	9.2	6
Chromium (VI)	1.2	6	1.2	1.2	0	33	1.2			1.2	1.2	1.2	1.2	1.2	1.2
Copper	1	6	22	60	0	69000	56.916646	POTENTIALLY SUITABLE FOR USE		23	22	24	26	60	31
Lead	2	6	6.2	13	0	2330	16.138447	POTENTIALLY SUITABLE FOR USE		6.6	13	6.4	13	13	6.2
Mercury, inorganic	0.3	6	0.3	2.1	0	3600	1.908	POTENTIALLY SUITABLE FOR USE		0.3	2.1	0.3	0.3	0.3	0.3
Nickel	2	6	5.1	47	0	1700	49.191996	POTENTIALLY SUITABLE FOR USE		15	47	13	33	5.1	9.2
Selenium	1	6	1	1	0	13000	1			1	1	1	1	1	1
Vanadium	1	6	32	64	0	9000	68.553278	POTENTIALLY SUITABLE FOR USE		48	36	51	32	64	54
Zinc	2	6	39	64	0	670000	70.349171	POTENTIALLY SUITABLE FOR USE		40	58	41	64	59	39
Cyanide (free)	1	6	1	1	0	16000	1			1	1	1	1	1	1
Phenol (total)	2	6	1	1	0	760	1			1	1	1	1	1	1
Acenaphthene	0.05	6	0.1	0.1	0	84000	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1
Acenaphthylene	0.05	6	0.1	0.2	0	83000	0.1893333	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.2
Anthracene	0.05	6	0.1	0.54	0	520000	0.4930667	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.54
Benz(a)anthracene	0.05	6	0.1	0.37	0	86	0.3412	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.37
Benzo(a)pyrene	0.05	6	0.1	0.26	0	14	0.2429333	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.26
Benzo(b)fluoranthene	0.05	6	0.1	0.28	0	97	0.2608	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.28
Benzo(ghi)perylene	0.05	6	0.05	0.05	0	630	0.05	POTENTIALLY SUITABLE FOR USE		0.05	0.05	0.05	0.05	0.05	0.05
Benzo(k)fluoranthene	0.05	6	0.1	0.24	0	140	0.2250667	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.24
Chrysene	0.05	6	0.05	0.48	0	140	0.4341333	POTENTIALLY SUITABLE FOR USE		0.05	0.05	0.05	0.05	0.05	0.48
Dibenz(a,h)anthracene	0.05	6	0.1	0.1	0	12	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1
Fluoranthene	0.05	6	0.1	0.86	0	23000	0.7789333	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.86
Fluorene	0.05	6	0.1	0.38	0	63000	0.3501333	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.38
Indeno(1,2,3,cd)pyrene	0.05	6	0.1	0.1	0	58	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1
Naphthalene	0.05	6	0.05	0.75	0	190	0.6753333	POTENTIALLY SUITABLE FOR USE		0.05	0.05	0.05	0.05	0.05	0.75
Phenanthrene	0.05	6	0.1	1.3	0	22000	1.172	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	1.3
Pyrene	0.05	6	0.1	0.59	0	54000	0.5377333	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.59
Asbestos identified	Y/N									N	N	N	N	N	N
FOC (dimensionless)	0.003567	**(mean)**								0.001	0.0032	0.001	0.0039	0.0048	0.0075
SOM (calculated)	0.61%	**(mean)**								0.17%	0.55%	0.17%	0.67%	0.83%	1.29%
pH (su)	9.3	**(mean)**								10.5	8.3	10.3	8.5	9.1	9.1

Risk parameter: **Human health - commercial (1%SOM)**
Data set: SERVICE STATION
Client: Ashfield Land
Site: Rail Central
Job no.: C151171
Lab. report no(s).: 16-29767

Legend: Values in blue are at or below the laboratory reporting limit (where a single value is indicated) and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate.
Values in red are equal to, or greater than, the generic assessment criterion (GAC).
MG denotes Made Ground
NAT denotes natural ground

Assessment of Chemicals of Potential Concern to Plant Life

Hydrock

All values in mg/kg unless otherwise stated								Soil Type	MG	WMS	MG	WMS	MG	MG											
								Location & Depth	WSS07	WSS05	WSS06	WSS02	WSS01	WSS04											
Chemical of Potential Concern	**Lab. RL**	**No. Samples**	**Min. Value**	**Max. Value**	**No. Samples > or = GAC**	**GAC**	**US_{95}**	**Result of Significance Test**	**0.3**	**1.25**	**0.4**	**1.3**	**0.3**	**0.35**											
Arsenic	1	6	1.7	15	0	250	16.93172	POTENTIALLY SUITABLE FOR USE	13	1.7	3.7	15	2.8	3.6											
Boron	0.2	6	0.2	0.9	0	3	1.116332	POTENTIALLY SUITABLE FOR USE	0.5	0.7	0.9	0.9	0.2	0.3											
Chromium (III)	1	6	6	38	0	400	44.85617	POTENTIALLY SUITABLE FOR USE	11	38	14	37	9.2	6											
Chromium (VI)	1.2	6	1.2	1.2	0	25	1.2		1.2	1.2	1.2	1.2	1.2	1.2											
Copper	1	6	22	60	0	135	56.91665	POTENTIALLY SUITABLE FOR USE	23	22	24	26	60	31											
Nickel	2	6	5.1	47	0	75	49.192	POTENTIALLY SUITABLE FOR USE	15	47	13	33	5.1	9.2											
Zinc	2	6	39	64	0	300	70.34917	POTENTIALLY SUITABLE FOR USE	40	58	41	64	59	39											
	Mean																								
pH (su)	9.3								10.5	8.3	10.3	8.5	9.1	9.1											

Risk parameter: **Plant life pH 7**
Data set: SERVICE STATION
Client: Ashfield Land
Site: Rail Central
Job no.: C151171
Lab. report no(s).: 16-29767

Legend: Values in blue are at or below the laboratory reporting limit (where a single value is indicated) and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate.
Values in red are equal to, or greater than, the generic assessment criterion (GAC).
MG denotes Made Ground
NAT denotes natural ground

Assessment of Chemicals of Potential Concern to Human Health

Hydrock

All values in mg/kg unless otherwise stated								Soil Type	WMS	AL	WMS	WMS	WMS	WMS	WMS	WMS	WMS	AL	GT	GT	GT	GT	GFD
								Location & Depth	TPT008	TPT006	TPG020	TPT026	TPR008	TPT025	TPR009	TPG011	TPR010	TPA004	WSLF001	WSLF002	WSLF003	WSLF004	TPA047
Chemical of Potential Concern	**Lab. RL**	**No. Samples**	**Min. Value**	**Max. Value**	**No. Samples > or = GAC**	**GAC**	**US_{95}**	**Result of Significance Test**	**1.60-2.40**	**1.10-1.50**	**1.4**	**1**	**1**	**1**	**1**	**1**	**1**	**0.30-0.60**	**0.3**	**1.2**	**1.3**	**1.4**	**1.10-1.40**
Arsenic	1	15	5.4	32	0	640	24.767532	POTENTIALLY SUITABLE FOR USE	5.4	24	13	21	22	15	12	17	15	32	14	11	5.4	14	26
Beryllium	0.06	15	1	2.2	0	390	1.8288	POTENTIALLY SUITABLE FOR USE	1.3	2.2	1	1.4	1.9	1.5	1.6	1.6	1.5	1.5	1.1	1.5	1.2	1.2	1.7
Boron	0.2	15	0.4	5.6	0	190000	3.5017225	POTENTIALLY SUITABLE FOR USE	5.6	3	0.8	2.9	0.4	1.7	2.2	2.8	2.8	0.9	0.9	1.6	2	1.8	0.4
Cadmium	0.2	15	0.2	0.2	0	220	0.2	POTENTIALLY SUITABLE FOR USE	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Chromium (III)	1	15	34	83	0	8400	63.497067	POTENTIALLY SUITABLE FOR USE	49	83	34	52	54	57	57	55	49	43	40	52	50	50	41
Chromium (VI)	1.2	15	1.2	1.2	0	33	1.2	POTENTIALLY SUITABLE FOR USE	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Copper	1	15	1	32	0	69000	25.112627	POTENTIALLY SUITABLE FOR USE	14	1	5	13	1	12	15	12	18	15	32	26	22	23	20
Lead	2	15	11	35	0	2330	26.477932	POTENTIALLY SUITABLE FOR USE	13	19	11	16	16	18	15	18	17	18	35	18	14	16	35
Mercury, inorganic	0.3	15	0.3	0.7	0	3600	0.4511469	POTENTIALLY SUITABLE FOR USE	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.7	0.3
Nickel	2	15	22	59	0	1700	50.789401	POTENTIALLY SUITABLE FOR USE	31	35	37	41	42	46	45	59	54	33	22	43	34	31	47
Selenium	1	15	1	4.6	0	13000	2.5808172	POTENTIALLY SUITABLE FOR USE	1	1	1	1	1	1	1	1	1	1	4.6	3.1	1	1.5	1
Vanadium	1	15	32	100	0	9000	81.190814	POTENTIALLY SUITABLE FOR USE	32	100	39	38	95	40	37	41	37	81	56	44	37	37	90
Zinc	2	15	52	160	0	670000	113.17084	POTENTIALLY SUITABLE FOR USE	68	97	63	69	96	72	76	85	72	110	160	67	52	56	97
Cyanide (free)	1	15	1	1	0	16000	1	POTENTIALLY SUITABLE FOR USE	1.000001	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Phenol (total)	2	15	1	1	0	3200	1	POTENTIALLY SUITABLE FOR USE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Acenaphthene	0.05	15	0.1	1.2	0	100000	0.4930667	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.2	0.1	0.1	0.1	0.1
Acenaphthylene	0.05	15	0.1	0.1	0	100000	0.1	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Anthracene	0.05	15	0.1	1.8	0	540000	0.7074667	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.8	0.1	0.1	0.1	0.1
Benz(a)anthracene	0.05	15	0.1	3.1	0	94	1.172	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	3.1	0.1	0.1	0.1	0.1
Benzo(a)pyrene	0.05	15	0.1	3.2	0	14	1.2077333	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	3.2	0.1	0.1	0.1	0.1
Benzo(b)fluoranthene	0.05	15	0.1	3.4	0	99	1.2792	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	3.4	0.1	0.1	0.1	0.1
Benzo(ghi)perylene	0.05	15	0.05	1.5	0	640	0.5681333	POTENTIALLY SUITABLE FOR USE	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	1.5	0.05	0.05	0.05	0.05
Benzo(k)fluoranthene	0.05	15	0.1	2.5	0	140	0.9576	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	2.5	0.1	0.1	0.1	0.1
Chrysene	0.05	15	0.05	3.3	0	140	1.2113333	POTENTIALLY SUITABLE FOR USE	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	3.3	0.05	0.05	0.05	0.05
Dibenz(a,h)anthracene	0.05	15	0.1	0.29	0	13	0.1678933	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.29	0.1	0.1	0.1	0.1
Fluoranthene	0.05	15	0.1	9.9	0	23000	3.6018667	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	9.9	0.1	0.1	0.1	0.1
Fluorene	0.05	15	0.1	0.73	0	71000	0.32512	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.73	0.1	0.1	0.1	0.1
Indeno(1,2,3,cd)pyrene	0.05	15	0.1	1.2	0	60	0.4930667	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.2	0.1	0.1	0.1	0.1
Naphthalene	0.05	15	0.05	0.26	0	1100	0.12504	POTENTIALLY SUITABLE FOR USE	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.26	0.05	0.05	0.05	0.05
Phenanthrene	0.05	15	0.1	6.7	0	23000	2.4584	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	6.7	0.1	0.1	0.1	0.1
Pyrene	0.05	15	0.1	8.6	0	55000	3.1373333	POTENTIALLY SUITABLE FOR USE	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	8.6	0.1	0.1	0.1	0.1
Asbestos identified	Y/N								N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
FOC (dimensionless)	0.006153	**(mean)**							0.0084	0.012	0.0021	0.0027	0.0026	0.0054	0.0047	0.0035	0.0051	0.0044	0.018	0.0055	0.0074	0.0074	0.0031
SOM (calculated)	1.10%	**(mean)**							1.45%	2.07%	0.36%	0.47%	0.45%	0.93%	0.81%	0.60%	0.88%	0.76%	3.10%	0.95%	1.28%	1.28%	
pH (su)	7.9	**(mean)**							8.2	8.3	8.3	7.5	7.3	6.5	7.8	7.6	7.8	7.8	7.7	8.2	8.5	8.5	8.4

Risk parameter: **Human health - commercial (6%SOM)**
Data set: NATURAL
Client: Ashfield Land
Site: Rail Central
Job no.: C151171
Lab. report no(s).: 16-27565, 16-28522, 16-29767

Legend: Values in blue are at or below the laboratory reporting limit (where a single value is indicated) and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate.
Values in red are equal to, or greater than, the generic assessment criterion (GAC).
MG denotes Made Ground
NAT denotes natural ground

Assessment of Chemicals of Potential Concern to Plant Life

Hydrock

All values in mg/kg unless otherwise stated								Soil Type	WMS	AL	WMS	WMS	WMS	WMS	WMS	WMS	WMS	AL	GT	GT	GT	GT	GFD
								Location & Depth	TPT008	TPT006	TPG020	TPT026	TPR008	TPT025	TPR009	TPG011	TPR010	TPA004	WSLF001	WSLF002	WSLF003	WSLF004	TPA047
Chemical of Potential Concern	**Lab. RL**	**No. Samples**	**Min. Value**	**Max. Value**	**No. Samples > or = GAC**	**GAC**	**US_{95}**	**Result of Significance Test**	**1.60-2.40**	**1.10-1.50**	**1.4**	**1**	**1**	**1**	**1**	**1**	**1**	**0.30-0.60**	**0.3**	**1.2**	**1.3**	**1.4**	**1.10-1.40**
Arsenic	1	15	5.4	32	0	250	24.76753	POTENTIALLY SUITABLE FOR USE	5.4	24	13	21	22	15	12	17	15	32	14	11	5.4	14	26
Boron	0.2	15	0.4	5.6	2	3	3.501722	FURTHER ASSESSMENT REQUIRED	5.6	3	0.8	2.9	0.4	1.7	2.2	2.8	2.8	0.9	0.9	1.6	2	1.8	0.4
Chromium (III)	1	15	34	83	0	400	63.49707	POTENTIALLY SUITABLE FOR USE	49	83	34	52	54	57	57	55	49	43	40	52	50	50	41
Chromium (VI)	1.2	15	1.2	1.2	0	25	1.2	POTENTIALLY SUITABLE FOR USE	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Copper	1	15	1	32	0	135	25.11263	POTENTIALLY SUITABLE FOR USE	14	1	5	13	1	12	15	12	18	15	32	26	22	23	20
Nickel	2	15	22	59	0	75	50.7894	POTENTIALLY SUITABLE FOR USE	31	35	37	41	42	46	45	59	54	33	22	43	34	31	47
Zinc	2	15	52	160	0	300	113.1708	POTENTIALLY SUITABLE FOR USE	68	97	63	69	96	72	76	85	72	110	160	67	52	56	97
	Mean																						
pH (su)	7.9								8.2	8.3	8.3	7.5	7.3	6.5	7.8	7.6	7.8	7.8	7.7	8.2	8.5	8.5	8.4

Risk parameter: **Plant life pH 7**
Data set: NATURAL
Client: Ashfield Land
Site: Rail Central
Job no.: C151171
Lab. report no(s).: 16-27565, 16-28522, 16-29767

Legend: Values in blue are at or below the laboratory reporting limit (where a single value is indicated) and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate.
Values in red are equal to, or greater than, the generic assessment criterion (GAC).
MG denotes Made Ground
NAT denotes natural ground

Assessment of Chemicals of Potential Concern to Human Health

Hydrock

All values in mg/kg unless otherwise stated

Chemical of Potential Concern	Lab. RL	No. Samples	Min. Value	Max. Value	No. Samples > or = GAC	GAC	US_{95}	Result of Significance Test	Soil Type	MG - LF	MG - LF	MG - LF	MG - LF	TS	TS	TS	TS	TS	TS	TS	TS			
									Location & Depth	TPL007	TPL008	TPL011	TPL010	TPL002	TPL001	TPL004	TPL003	TPL005	TPL009	TPL006	TPL010			
										0.5	0.7	0.8	2.7	0.2	0.15	0.25	0.3	0.15	0.25	0.25	0.15			
Arsenic	1	12	10	120	0	640	69.391042	POTENTIALLY SUITABLE FOR USE		41	19	120	32	21	16	10	20	22	43	30	11			
Beryllium	0.06	12	0.62	5	0	390	2.929574	POTENTIALLY SUITABLE FOR USE		1.2	1.5	5	1.4	1.3	1.2	0.8	1.3	1.1	1.4	1.3	0.62			
Boron	0.2	12	1	2.7	0	190000	2.5237491	POTENTIALLY SUITABLE FOR USE		1.5	2.4	1.8	1.7	2.1	1	1.8	2.7	1.3	2.5	2.2	1.5			
Cadmium	0.2	12	0.2	0.2	0	220	0.2	POTENTIALLY SUITABLE FOR USE		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2			
Chromium (III)	1	12	27	270	0	8400	143.4214	POTENTIALLY SUITABLE FOR USE		37	44	270	57	42	41	28	42	36	44	44	27			
Chromium (VI)	1.2	12	1.2	1.2	0	33	1.2	POTENTIALLY SUITABLE FOR USE		1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2			
Copper	1	12	4.8	43	0	69000	26.826307	POTENTIALLY SUITABLE FOR USE		8.5	5.4	16	4.8	20	8.9	7.4	18	14	4.8	10	43			
Lead	2	12	22	58	0	2330	50.147401	POTENTIALLY SUITABLE FOR USE		48	22	28	27	58	23	22	53	32	31	37	36			
Mercury, inorganic	0.3	12	0.3	0.7	0	3600	0.4786667	POTENTIALLY SUITABLE FOR USE		0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.7	0.3	0.3			
Nickel	2	12	14	76	0	1700	49.653003	POTENTIALLY SUITABLE FOR USE		29	29	76	37	26	24	14	27	23	29	28	18			
Selenium	1	12	1	3.3	0	13000	2.0273333	POTENTIALLY SUITABLE FOR USE		1	1	3.3	1	1	1	1	1	1	1	1	1			
Vanadium	1	12	36	430	0	9000	226.70013	POTENTIALLY SUITABLE FOR USE		73	60	430	78	66	54	42	60	56	78	66	36			
Zinc	2	12	54	220	0	670000	145.4926	POTENTIALLY SUITABLE FOR USE		92	81	220	93	94	71	54	85	69	85	88	85			
Cyanide (free)	1	12	1	1	0	16000	1	POTENTIALLY SUITABLE FOR USE		1	1	1	1	1	1	1	1	1	1	1	1			
Phenol (total)	2	12	1	1	0	3200	1	POTENTIALLY SUITABLE FOR USE		1	1	1	1	1	1	1	1	1	1	1	1			
Acenaphthene	0.05	12	0.1	0.48	0	100000	0.2697333	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.48	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1			
Acenaphthylene	0.05	12	0.1	0.1	0	100000	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1			
Anthracene	0.05	12	0.1	0.43	0	540000	0.2474	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.43	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1			
Benz(a)anthracene	0.05	12	0.1	1.3	0	94	0.636	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	1.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1			
Benzo(a)pyrene	0.05	12	0.1	0.86	0	14	0.4394667	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.86	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1			
Benzo(b)fluoranthene	0.05	12	0.1	1.1	0	99	0.5466667	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	1.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1			
Benzo(ghi)perylene	0.05	12	0.05	0.47	0	640	0.2376	POTENTIALLY SUITABLE FOR USE		0.05	0.05	0.05	0.47	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05			
Benzo(k)fluoranthene	0.05	12	0.1	0.35	0	140	0.2116667	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.35	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1			
Chrysene	0.05	12	0.05	0.96	0	140	0.4564667	POTENTIALLY SUITABLE FOR USE		0.05	0.05	0.05	0.96	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05			
Dibenz(a,h)anthracene	0.05	12	0.1	0.1	0	13	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1			
Fluoranthene	0.05	12	0.1	3.4	0	23000	1.574	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	3.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1			
Fluorene	0.05	12	0.1	0.56	0	71000	0.3054667	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.56	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1			
Indeno(1,2,3,cd)pyrene	0.05	12	0.1	0.34	0	60	0.2072	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.34	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1			
Naphthalene	0.05	12	0.05	0.05	0	1100	0.05	POTENTIALLY SUITABLE FOR USE		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05			
Phenanthrene	0.05	12	0.1	2.6	0	23000	1.2166667	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	2.6	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1			
Pyrene	0.05	12	0.1	2.8	0	55000	1.306	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	2.8	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1			
Asbestos identified	Y/N									N	N	N	N	N	N	N	N	N	N	N	N			
FOC (dimensionless)	0.012617	**(mean)**								0.007	0.0076	0.0072	0.009	0.019	0.0078	0.0098	0.019	0.015	0.016	0.017	0.017			
SOM (calculated)	2.18%	**(mean)**								1.21%	1.31%	1.24%	1.55%	3.28%	1.34%	1.69%	3.28%	2.59%	2.76%	2.93%	2.93%			
pH (su)	8.1	**(mean)**								8.7	8.2	8.4	8.2	7.8	8	7.7	8.1	8.3	8	7.7	7.5			

Risk parameter: **Human health - commercial (6%SOM)**
Data set: MADE GROUND LANDFILL
Client: Ashfield Land
Site: Rail Central
Job no.: C151171
Lab. report no(s).: 16-27565, 16-28522, 16-29767

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Assessment of Chemicals of Potential Concern to Plant Life

Hydrock

All values in mg/kg unless otherwise stated

Chemical of Potential Concern	Lab. RL	No. Samples	Min. Value	Max. Value	No. Samples > or = GAC	GAC	US_{95}	Result of Significance Test	Soil Type	MG - LF	MG - LF	MG - LF	MG - LF	TS	TS	TS	TS	TS	TS	TS	TS			
									Location & Depth	TPL007	TPL008	TPL011	TPL010	TPL002	TPL001	TPL004	TPL003	TPL005	TPL009	TPL006	TPL010			
										0.5	0.7	0.8	2.7	0.2	0.15	0.25	0.3	0.15	0.25	0.25	0.15			
Arsenic	1	12	10	120	0	250	69.39104	POTENTIALLY SUITABLE FOR USE		41	19	120	32	21	16	10	20	22	43	30	11			
Boron	0.2	12	1	2.7	0	3	2.523749	POTENTIALLY SUITABLE FOR USE		1.5	2.4	1.8	1.7	2.1	1	1.8	2.7	1.3	2.5	2.2	1.5			
Chromium (III)	1	12	27	270	0	400	143.4214	POTENTIALLY SUITABLE FOR USE		37	44	270	57	42	41	28	42	36	44	44	27			
Chromium (VI)	1.2	12	1.2	1.2	0	25	1.2	POTENTIALLY SUITABLE FOR USE		1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2			
Copper	1	12	4.8	43	0	135	26.82631	POTENTIALLY SUITABLE FOR USE		8.5	5.4	16	4.8	20	8.9	7.4	18	14	4.8	10	43			
Nickel	2	12	14	76	1	75	49.653	POTENTIALLY SUITABLE FOR USE		29	29	76	37	26	24	14	27	23	29	28	18			
Zinc	2	12	54	220	0	300	145.4926	POTENTIALLY SUITABLE FOR USE		92	81	220	93	94	71	54	85	69	85	88	85			
	Mean																							
pH (su)	8.1									8.7	8.2	8.4	8.2	7.8	8	7.7	8.1	8.3	8	7.7	7.5			

Risk parameter: Plant life pH 7
Data set: MADE GROUND LANDFILL
Client: Ashfield Land
Site: Rail Central
Job no.: C151171
Lab. report no(s).: 16-27565, 16-28522, 16-29767

Legend: Values in blue are at or below the laboratory reporting limit (where a single value is indicated) and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate.
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MG denotes Made Ground
NAT denotes natural ground

Assessment of Chemicals of Potential Concern to Human Health

Hydrock

All values in mg/kg unless otherwise stated

Chemical of Potential Concern	Lab. RL	No. Samples	Min. Value	Max. Value	No. Samples > or = GAC	GAC	US_{95}	Result of Significance Test	Soil Type	MG	MG	MG	MG	MG	MG	MG	MG	MG
									Location & Depth	TPT005	TPT006	TPT005	TPT027	TPT028	TPG047	WSLF002	WSLF003	WSLF004
										0.45-1.10	0.00-0.15	0.00-0.45	0.4	0.3	0.5	0.2	0.2	0.2
Arsenic	1	9	16	36	0	640	36.829585	POTENTIALLY SUITABLE FOR USE		27	36	34	33	30	23	16	24	26
Beryllium	0.06	9	0.79	7.5	0	390	5.8912262	POTENTIALLY SUITABLE FOR USE		2.4	2.1	2	4.8	1.8	1.9	0.79	7.5	3.1
Boron	0.2	9	0.9	5.1	0	190000	4.254602	POTENTIALLY SUITABLE FOR USE		1.9	5.1	3.8	2.3	2.3	1.9	1.7	0.9	1.4
Cadmium	0.2	9	0.2	0.5	0	220	0.4291543	POTENTIALLY SUITABLE FOR USE		0.2	0.2	0.2	0.5	0.3	0.2	0.2	0.2	0.4
Chromium (III)	1	9	27	97	0	8400	98.046056	POTENTIALLY SUITABLE FOR USE		95	97	87	32	41	51	27	27	43
Chromium (VI)	1.2	9	1.2	1.2	0	33	1.2			1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Copper	1	9	4.3	190	0	69000	139.6896	POTENTIALLY SUITABLE FOR USE		6.8	4.5	4.3	190	30	70	18	100	25
Lead	2	9	22	330	0	2330	216.94971	POTENTIALLY SUITABLE FOR USE		23	41	37	330	41	98	22	26	39
Mercury, inorganic	0.3	9	0.3	2.3	0	3600	1.755844	POTENTIALLY SUITABLE FOR USE		0.3	0.3	0.3	2.3	0.4	1.3	0.3	1.1	0.3
Nickel	2	9	18	64	0	1700	63.423183	POTENTIALLY SUITABLE FOR USE		39	45	40	63	25	39	18	64	21
Selenium	1	9	1	4.6	0	13000	4.0746284	POTENTIALLY SUITABLE FOR USE		1	1	1	1	1	1	1.3	4.5	4.6
Vanadium	1	9	41	150	0	9000	143.03434	POTENTIALLY SUITABLE FOR USE		110	150	140	78	73	66	41	80	87
Zinc	2	9	41	170	0	670000	154.85105	POTENTIALLY SUITABLE FOR USE		120	170	130	75	93	85	41	90	110
Cyanide (free)	1	9	1	1	0	16000	1			1	1	1	1	1	1	1	1	1
Phenol (total)	2	9	1	1	0	3200	1			1	1	1	1	1	1	1	1	1
Acenaphthene	0.05	9	0.1	1.7	0	100000	1.0528889	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.7
Acenaphthylene	0.05	9	0.1	1.3	0	100000	0.8463032	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.39	0.1	0.1	0.1	1.3
Anthracene	0.05	9	0.1	8.3	0	540000	5.005543	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.46	0.1	0.1	0.1	8.3
Benz(a)anthracene	0.05	9	0.1	17	0	94	10.370548	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	2.4	0.4	0.1	0.1	17
Benzo(a)pyrene	0.05	9	0.1	21	1	14	12.824503	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	3.2	0.32	0.1	0.1	21
Benzo(b)fluoranthene	0.05	9	0.1	19	0	99	11.634608	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	3.1	0.37	0.1	0.1	19
Benzo(ghi)perylene	0.05	9	0.05	15	0	640	9.1135257	POTENTIALLY SUITABLE FOR USE		0.05	0.05	0.05	0.05	2	0.05	0.05	0.05	15
Benzo(k)fluoranthene	0.05	9	0.1	15	0	140	9.1954199	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	2.5	0.26	0.1	0.1	15
Chrysene	0.05	9	0.05	14	0	140	8.5647201	POTENTIALLY SUITABLE FOR USE		0.05	0.05	0.05	0.05	2.2	0.43	0.05	0.05	14
Dibenz(a,h)anthracene	0.05	9	0.1	3.3	0	13	2.0213778	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.33	0.1	0.1	0.1	3.3
Fluoranthene	0.05	9	0.1	38	0	23000	23.094354	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	5	0.59	0.1	0.1	38
Fluorene	0.05	9	0.1	2.1	0	71000	1.2911111	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	2.1
Indeno(1,2,3,cd)pyrene	0.05	9	0.1	12	0	60	7.319933	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	1.7	0.1	0.1	0.1	12
Naphthalene	0.05	9	0.05	0.5	0	1100	0.318	POTENTIALLY SUITABLE FOR USE		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.5
Phenanthrene	0.05	9	0.1	29	0	23000	17.420932	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	1.6	0.4	0.1	0.1	29
Pyrene	0.05	9	0.1	32	0	55000	19.472053	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	4.4	0.47	0.1	0.1	32
Asbestos identified	Y/N									N	N	N	Y	N	N	N	N	Y
FOC (dimensionless)	0.022489	**(mean)**								0.012	0.04	0.026	0.022	0.017	0.014	0.0074	0.032	0.032
SOM (calculated)	3.88%	**(mean)**								2.07%	6.90%	4.48%	3.79%	2.93%	2.41%	1.28%	5.52%	5.52%
pH (su)	8.0	**(mean)**								8.3	7.7	8.1	7.8	7.9	8.3	7.7	7.9	8.7

Risk parameter: Human health - commercial (6%SOM)
Data set: MADE GROUND FARM
Client: Ashfield Land
Site: Rail Central
Job no.: C151171
Lab. report no(s).: 16-27565, 16-28522, 16-29767

Legend: Values in blue are at or below the laboratory reporting limit (where a single value is indicated) and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate.
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NAT denotes natural ground

Assessment of Chemicals of Potential Concern to Plant Life

Hydrock

All values in mg/kg unless otherwise stated								Soil Type	MG	MG	MG	MG	MG	MG	MG	MG	MG						
								Location & Depth	TPT005	TPT006	TPT005	TPT027	TPT028	TPG047	WSLF002	WSLF003	WSLF004						
Chemical of Potential Concern	**Lab. RL**	**No. Samples**	**Min. Value**	**Max. Value**	**No. Samples > or = GAC**	**GAC**	**US_{95}**	**Result of Significance Test**	**0.45-1.10**	**0.00-0.15**	**0.00-0.45**	**0.4**	**0.3**	**0.5**	**0.2**	**0.2**	**0.2**						
Arsenic	1	9	16	36	0	250	36.82958	POTENTIALLY SUITABLE FOR USE	27	36	34	33	30	23	16	24	26						
Boron	0.2	9	0.9	5.1	2	3	4.254602	FURTHER ASSESSMENT REQUIRED	1.9	5.1	3.8	2.3	2.3	1.9	1.7	0.9	1.4						
Chromium (III)	1	9	27	97	0	400	98.04606	POTENTIALLY SUITABLE FOR USE	95	97	87	32	41	51	27	27	43						
Chromium (VI)	1.2	9	1.2	1.2	0	25	1.2		1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2						
Copper	1	9	4.3	190	1	135	139.6896	FURTHER ASSESSMENT REQUIRED	6.8	4.5	4.3	190	30	70	18	100	25						
Nickel	2	9	18	64	0	75	63.42318	POTENTIALLY SUITABLE FOR USE	39	45	40	63	25	39	18	64	21						
Zinc	2	9	41	170	0	300	154.8511	POTENTIALLY SUITABLE FOR USE	120	170	130	75	93	85	41	90	110						
	Mean																						
pH (su)	8.0								8.3	7.7	8.1	7.8	7.9	8.3	7.7	7.9	8.7						

Risk parameter: **Plant life pH 7**
Data set: MADE GROUND FARM
Client: Ashfield Land
Site: Rail Central
Job no.: C151171
Lab. report no(s).: 16-27565, 16-28522, 16-29767

Legend: Values in blue are at or below the laboratory reporting limit (where a single value is indicated) and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate.
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Assessment of Chemicals of Potential Concern to Human Health

Hydrock

All values in mg/kg unless otherwise stated

Chemical of Potential Concern	Lab. RL	No. Samples	Min. Value	Max. Value	No. Samples > or = GAC	GAC	US_{95}	Result of Significance Test	Soil Type	MG - RC	MG - RC	MG - RC	MG - RC	MG - RC	MG - RC	MG - RC	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS
									Location & Depth	TPT010	TPT011	TPT019	TPT021	TPT019	TPT024	TPT022	TPT026	TPT019	TPT023	TPT025	TPT021	TPT011	TPT008	TPT009	TPT007	TPT010	TPT024	TPT022
										2.40-3.00	2.80-3.00	1.50-2.00	1.80-2.40	1.2	1.5	1.5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Arsenic	1	19	12	51	0	640	33.82297	POTENTIALLY SUITABLE FOR USE		14	16	28	51	28	12	35	18	22	31	21	15	41	14	16	19	14	13	30
Beryllium	0.06	19	0.88	2.3	0	390	1.604884	POTENTIALLY SUITABLE FOR USE		1.1	1.1	0.9	2.3	1.4	1.5	1.3	1.2	1.3	1.4	1.4	1.2	1.6	0.88	0.93	1.2	0.94	1.1	1.5
Boron	0.2	19	0.6	6.1	0	190000	4.083402	POTENTIALLY SUITABLE FOR USE		3.5	6.1	4.2	5.7	2.8	3	2.9	1.1	1.4	2.5	2	1.3	1.6	2.5	1.6	1.8	2.7	0.6	2.7
Cadmium	0.2	19	0.2	0.2	0	220	0.2	POTENTIALLY SUITABLE FOR USE		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Chromium (III)	1	19	33	150	0	8400	101.4249	POTENTIALLY SUITABLE FOR USE		40	40	150	120	150	78	47	50	55	65	58	42	62	33	41	43	33	35	84
Chromium (VI)	1.2	19	1.2	1.2	0	33	1.2	POTENTIALLY SUITABLE FOR USE		1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Copper	1	19	1	28	0	69000	19.03464	POTENTIALLY SUITABLE FOR USE		12	1	1.3	12	12	14	12	1	18	14	12	22	6.2	14	12	16	15	28	11
Lead	2	19	12	46	0	2330	30.28723	POTENTIALLY SUITABLE FOR USE		13	14	36	24	46	18	12	16	25	22	29	15	24	21	15	22	18	17	27
Mercury, inorganic	0.3	19	0.3	0.7	0	3600	0.514519	POTENTIALLY SUITABLE FOR USE		0.3	0.3	0.3	0.3	0.6	0.3	0.3	0.3	0.3	0.3	0.7	0.3	0.5	0.3	0.7	0.4	0.3	0.3	0.3
Nickel	2	19	17	36	0	1700	30.7503	POTENTIALLY SUITABLE FOR USE		30	36	24	32	17	32	28	20	21	29	26	30	29	17	21	20	21	23	24
Selenium	1	19	1	2.1	0	13000	1.422402	POTENTIALLY SUITABLE FOR USE		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2.1	1	1	1.9
Vanadium	1	19	32	270	0	9000	163.1563	POTENTIALLY SUITABLE FOR USE		32	34	190	230	270	110	54	71	86	100	78	53	84	45	40	60	36	40	160
Zinc	2	19	26	88	0	670000	80.33406	POTENTIALLY SUITABLE FOR USE		57	59	37	88	26	67	60	62	64	85	88	60	86	59	54	68	60	57	79
Cyanide (free)	1	19	1	1	0	16000	1	POTENTIALLY SUITABLE FOR USE		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Phenol (total)	2	19	1	1	0	3200	1	POTENTIALLY SUITABLE FOR USE		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Acenaphthene	0.05	19	0.1	0.1	0	100000	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Acenaphthylene	0.05	19	0.1	0.1	0	100000	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Anthracene	0.05	19	0.1	0.1	0	540000	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Benz(a)anthracene	0.05	19	0.1	0.1	0	94	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Benzo(a)pyrene	0.05	19	0.1	0.1	0	14	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Benzo(b)fluoranthene	0.05	19	0.1	0.1	0	99	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Benzo(ghi)perylene	0.05	19	0.05	0.05	0	640	0.05	POTENTIALLY SUITABLE FOR USE		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Benzo(k)fluoranthene	0.05	19	0.1	0.1	0	140	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Chrysene	0.05	19	0.05	0.05	0	140	0.05	POTENTIALLY SUITABLE FOR USE		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Dibenz(a,h)anthracene	0.05	19	0.1	0.1	0	13	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Fluoranthene	0.05	19	0.1	0.1	0	23000	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Fluorene	0.05	19	0.1	0.1	0	71000	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Indeno(1,2,3,cd)pyrene	0.05	19	0.1	0.1	0	60	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Naphthalene	0.05	19	0.05	0.05	0	1100	0.05	POTENTIALLY SUITABLE FOR USE		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Phenanthrene	0.05	19	0.1	0.1	0	23000	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Pyrene	0.05	19	0.1	0.1	0	55000	0.1	POTENTIALLY SUITABLE FOR USE		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Asbestos identified	Y/N									N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
FOC (dimensionless)	0.01737	**(mean)**								0.0091	0.0096	0.0021	0.007	0.005	0.0071	0.0084	0.0078	0.031	0.03	0.028	0.01	0.024	0.028	0.02	0.024	0.027	0.02	0.032
SOM (calculated)	3.00%	**(mean)**								1.57%	1.66%	0.36%	1.21%	0.86%	1.22%	1.45%	1.34%	5.34%	5.17%	4.83%	1.72%	4.14%	4.83%	3.45%	4.14%	4.65%	3.45%	5.52%
pH (su)	8.1	**(mean)**								7.8	7.6	8.1	7.8	8.5	8.1	8.2	7.7	8.4	9.3	7.3	8.2	7.8	7.9	8.1	8.3	8	8.3	8.2

Risk parameter: Human health - commercial (6%SOM)
Data set: MADE GROUND ROADE CUTTING
Client: Ashfield Land
Site: Rail Central
Job no.: C151171
Lab. report no(s).: 16-27565, 16-28522, 16-29767

Legend: Values in blue are at or below the laboratory reporting limit (where a single value is indicated) and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate.
Values in red are equal to, or greater than, the generic assessment criterion (GAC).
MG denotes Made Ground
NAT denotes natural ground

Assessment of Chemicals of Potential Concern to Plant Life

Hydrock

All values in mg/kg unless otherwise stated									Soil Type	MG - RC	MG - RC	MG - RC	MG - RC	MG - RC	MG - RC	MG - RC	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS	TS
									Location & Depth	TPT010	TPT011	TPT019	TPT021	TPT019	TPT024	TPT022	TPT026	TPT019	TPT023	TPT025	TPT021	TPT011	TPT008	TPT009	TPT007	TPT010	TPT024	TPT022
Chemical of Potential Concern	**Lab. RL**	**No. Samples**	**Min. Value**	**Max. Value**	**No. Samples > or = GAC**	**GAC**	**US_{95}**	**Result of Significance Test**		**2.40-3.00**	**2.80-3.00**	**1.50-2.00**	**1.80-2.40**	**1.2**	**1.5**	**1.5**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
Arsenic	1	19	12	51	0	250	33.82297	POTENTIALLY SUITABLE FOR USE		14	16	28	51	28	12	35	18	22	31	21	15	41	14	16	19	14	13	30
Boron	0.2	19	0.6	6.1	5	3	4.083402	FURTHER ASSESSMENT REQUIRED		3.5	6.1	4.2	5.7	2.8	3	2.9	1.1	1.4	2.5	2	1.3	1.6	2.5	1.6	1.8	2.7	0.6	2.7
Chromium (III)	1	19	33	150	0	400	101.4249	POTENTIALLY SUITABLE FOR USE		40	40	150	120	150	78	47	50	55	65	58	42	62	33	41	43	33	35	84
Chromium (VI)	1.2	19	1.2	1.2	0	25	1.2	POTENTIALLY SUITABLE FOR USE		1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Copper	1	19	1	28	0	135	19.03464	POTENTIALLY SUITABLE FOR USE		12	1	1.3	12	12	14	12	1	18	14	12	22	6.2	14	12	16	15	28	11
Nickel	2	19	17	36	0	75	30.7503	POTENTIALLY SUITABLE FOR USE		30	36	24	32	17	32	28	20	21	29	26	30	29	17	21	20	21	23	24
Zinc	2	19	26	88	0	300	80.33406	POTENTIALLY SUITABLE FOR USE		57	59	37	88	26	67	60	62	64	85	88	60	86	59	54	68	60	57	79
	Mean																											
pH (su)	8.1									7.8	7.6	8.1	7.8	8.5	8.1	8.2	7.7	8.4	9.3	7.3	8.2	7.8	7.9	8.1	8.3	8	8.3	8.2

Risk parameter: Plant life pH 7
Data set: MADE GROUND ROADE CUTTING
Client: Ashfield Land
Site: Rail Central
Job no.: C151171
Lab. report no(s).: 16-27565, 16-28522, 16-29767

Legend: Values in blue are at or below the laboratory reporting limit (where a single value is indicated) and are considered as being at the detection limit for the purposes of statistical analysis, as a conservative estimate.
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MG denotes Made Ground
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