



PHASE II SITE APPRAISAL
WHINNEY HILL, GUIDE POST, NORTHUMBERLAND
for
DYSART DEVELOPMENTS LTD

July 2016

Phase II Site Appraisal
Whinney Hill, Guide Post, Northumberland
for
Dysart Developments Ltd

N16055	Phase II Site Appraisal, Whinney Hill, Guide Post, Northumberland
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Summary of Recommendations for Whinney Hill, Guide Post, Northumberland	
Risk to End-Users	Parts of the site may pose a risk to end-users and remediation is required in the form of removal and disposal of some localised contaminated made ground and placement of a 600mm thick soil cap in domestic gardens located in the southwest corner of the site.
Risk to Controlled Waters	No significant risk, remediation not required.
Ground Gases	Gas monitoring ongoing. Based on results to date gas protection will be required.
Concrete Specification	DS-1 and the ACEC Class as AC-1 may be assumed for concrete design over the majority of the site. DS-1 and the ACEC Class as AC-2z in localised areas of made ground.
Water Pipe Specification	Standard PE/PVC water pipes should be suitable for the site, subject to confirmation by the utility provider.
Engineering Ground Treatment	Ground improvement by vibro replacement is recommended to support foundation loads. A specialist contractor should be approached with respect to the suitability of this method.
Likely Foundation Types	Strip footings founded on vibro stone columns.
Bearing Strata	Glacial soils requiring ground improvement across the majority of the site.
Volume Change Potential	Test results indicate medium, occasionally high, volume change potential.
Tree Influence	Deepening for trees and heave precautions may locally be required.
Floor Slabs	Fully suspended floors with 150mm void.
Slope Stability Risk	The site rises steadily in elevation from the south east (c. 15m AOD) to the north west (c.33m AOD); slope stability is not considered to be an issue.
Retaining Walls	There are currently no retaining walls on the site. Should retaining walls be proposed then their stability should be assessed.
SUDs	The site is unlikely to be suitable for the use of soakaway drainage due to the presence of extensive laminated clay deposits.
Roads	For indicative purposes the near-surface untreated soils are likely to provide CBR values of <5%; the actual CBR values of the soils should be confirmed post treatment.

Likely Waste Classification	Made ground in the vicinity of Whinney Hill Farm will be hazardous waste due to the presence of asbestos; natural soils are considered likely to be non-hazardous or inert; subject to confirmation with receiving landfill.
Other Comments	Further investigation works are required due to the presence of shallow mine workings.

The above summary should not be used in isolation and reference should be made the full report which provides a detailed assessment of the risks affecting the development.

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1.0 Introduction

1.1 Commission

Patrick Parsons (PP) has been appointed by Dysart Developments Ltd (client) to produce a Phase II Site Appraisal for the site known as Whinney Hill, Guide Post, Northumberland.

1.2 Proposed Development

The current development proposals indicate some 300 no. residential units. The development will also incorporate private gardens, access roads, car parking and areas of soft landscaping. A site location plan and proposed development layout are provided as Drawings N16055-701 and 702 respectively in Appendix A.

1.3 Aim of Phase II Site Appraisal

The client's specific requirements were to undertake a Phase II Site Appraisal. The principal objectives are as follows:

- Obtain information about the soil and groundwater conditions.
- Determine the possible ground related geotechnical and contamination hazards that may affect the proposed development.
- Provide development recommendations.
- Provide advice on further works required.

1.4 Information Sources

This Phase II Site Appraisal is based on the findings of the investigation, chemical analysis and geotechnical testing undertaken during the course of the assessment. The results have been used to refine the conceptual model and initial recommendations outlined in the Patrick Parsons reports:

- Phase I Geoenvironmental Desk Study, Whinney Hill, Guide Post, Northumberland (ref. N16055) dated March 2016;
- Rotary drilling works land at Whinney Hill, Guidepost, Northumberland (ref: AC/sj/N16055) dated 30 June 2016.

1.5 Limitations

This report has been prepared for the client and their appointed agents only and should not be relied upon by any third party without the written permission of PP. If any unauthorised third party comes into possession of this report, they rely on it at their own risk and the authors do not owe them any Duty of Care or Skill. It is based on and limited to an assessment of the information and ground conditions identified here. PP is not responsible for ground conditions not revealed during investigations undertaken by third parties and have reviewed the information presented in good faith.

2.0 Site Details

Location	The site is located off the A1068 Choppington Road, approximately 500m south of Guide Post, Northumberland.
Area	Approximately 16.55 hectares (40.9 acres)
OS Grid Reference	NW 425347E, 584771N NE 425962E, 584849N SE 425962E, 584432N SW 425406E, 584393N
Description	<p>The site forms an irregular shaped plot of land, approximately 500m long and 400m wide.</p> <p>The land rises steadily in elevation from the south east (c. 15m AOD) to the north west (c.33m AOD).</p> <p>The majority of the site is identified as arable farmland comprising five main fields and parts of several others. A farm track leads from Whinney Hill Farm in the west (outside the proposed developable area) and trends west to east, which then changes to a southerly direction along the eastern boundary. Hedgerows border the five main fields and mature trees are present along the western boundary with the A1068.</p>
Adjacent Land Use	<p>Residential areas comprise the former farm houses at the centre of the site and properties to the west and northwest along Choppington Road.</p> <p>Arable farmland extends to north and east of the site.</p> <p>Mixed commercial and residential properties lie to the south of the site.</p>

3.0 Summary of Phase I Desk Study and Rotary Drilling Works

3.1 Phase I Desk Study

The following is a summary of the findings of the Phase I Desk Study and should not be read in isolation. For full details reference should be made to the report outlined in section 1.4. In summary, the preliminary geo-environmental risk assessment highlighted the following:

- The earliest historical mapping reviewed (1885) shows the site to be farmland with a track trending west to east through the centre of the site diverting south then east along the eastern boundary. A small pond is noted in the west immediately south of Whinney Hill Farm. Between 1896 and the 1970's there is little significant change with the exception of the construction of housing along the western boundary and the pond being absent by the 1960's. Between the 1970's and the present day the housing along the western boundary is no longer shown.
- There are no Environment Agency nor BGS recorded landfill sites reported within 500m of the site. There are two historical landfill records within 500m of the site; one 148m to the south which handled inert, industrial, commercial and household waste between the 1950s and 1990s (licence No. NBL/L/BED001), the second located 355m to the north east for the same waste types as above between the 1970s and 1990s. There are two waste treatment or disposal sites are noted within 500m of the site. Both relate to historical ground workings during the 1920s and 1930s recorded as refuse heaps.
- Made ground is not shown to be present on the site in the published geological mapping however, it is expected that made ground will be encountered on the site due to the adjacent developments. Superficial deposits of glacial sand and gravel is indicated to be present in the north west, surrounding Whinney Hill Farm. The remainder of the site is underlain by glacial till (glacial clay with variable quantities of silt, sand and gravel). These deposits are anticipated to be present to depths of 30m below ground level (bgl). The bedrock is shown to comprise Carboniferous Pennine Middle Coal Measures undifferentiated mudstone, siltstone, sandstone and coal in a band crossing the central area trending north east to south west. Sandstone is noted in the south east and in the north west. The combined High Main and Metal coal seams (Coal Authority designation, E and F1) are indicated to subcrop beneath the site with unknown dip down to the south east. The High Main seam ranges in thickness from 0.15-1.63m with the Metal ranging from 0.02-1.17m thick.
- The glacial till deposits are recorded as a Secondary (Undifferentiated) Aquifer, the glacial sand and gravel deposits and the underlying Pennine Middle Coal Measures are both Secondary (A) Aquifers. There are no groundwater abstraction licences, surface water abstraction licences or potable water abstraction licences within 2km of the site and no source protection zones within 500m of the site.
- A Coal Authority (CA) report states that there are workings beneath the site in 10 seams of coal from 30m to 280m depth last worked in 1971. The site lies in an area where coal is at or close to the surface which may have been worked at some time in the past. There are no mine entries within, or within 20m of the site boundaries. Pillar and stall workings may be present in the south eastern extent of the site within the High Main (E) seam, which dips beneath the eastern section of the site. There are no recorded non coal mining related underground workings within or within close proximity to the site.

The Phase I conceptual model is provided below:

Human Health			
Source	Pathway	Receptor	Pollutant Linkage
Former historical use as farmland: possible made ground associated with fly tipping, housing construction activities, land infilling or fuel oil spillages.	Direct contact and ingestion/inhalation of contaminated soil and dust	Construction workers	No, generally low levels of contaminants anticipated. Mitigation measures such as use of appropriate PPE and good site practice may be sufficient.
	Direct contact and ingestion/inhalation of contaminated soil and dust. Ingestion of home grown vegetables	End users	No, generally low levels of contaminants anticipated. Mitigation measures may be required as part of the development i.e. localised soils removal or clean capping soils in garden areas.
Ground gas associated with made ground (ponds/ off-site landfill deposits and coal mining).	Vertical and lateral migration into confined spaces. Inhalation	End users	Yes. Gas monitoring is likely to be required to confirm the ground gas regime particularly with regard to mine gases.
Controlled Waters			
Former historical use as farmland: possible made ground, fuel/oil spillages.	Vertical and lateral migration	Secondary Aquifer	Unlikely. Site anticipated to be underlain by 30m of low permeability superficial deposits.

3.2 Rotary Drilling Works

The rotary drilling ground investigation fieldwork was undertaken between the 20th and 24th June 2016 and comprised the drilling of 6 no. rotary open hole boreholes to a maximum depth of 46.2m bgl (ROH1). Boreholes ROH1 to ROH3 were positioned to target the combined High Main (E) and Metal (F1) seams down dip of the sub-crop based on the geological plans and mine abandonment plans. Boreholes ROH4 to ROH6 were positioned up dip of the crop to confirm the absence of these seams in other parts of the site. The area of greatest risk was located in the south and east within an area defined by the CA as being a development high risk area and an area of probable shallow coal workings.

The investigations generally suggest that a buried glacial channel may be present across the site with thicknesses of drift soils ranging from 26m to 37.5m bgl. Coal Authority information implied that workings are present in the High Main (E) at approximately 30m bgl most likely in the south east of the site. The Coal Authority online viewer suggests that an area of probable workings associated with the crop of the combined High Main (E) and Metal (F1) seams crosses the site in the east.

This investigation has proven the shallowest coal seams to be present at a depth of 36m bgl. Evidence of potential goafed (backfilled) workings were recorded in ROH1 at a depth of 42m bgl which coincides with pillar and stall workings on mine abandonment plans for the High Main (E) seam. Rock cover above these workings is less than the desired rock cover to seam thickness ratio typically

adopted for Carboniferous Coal Measures strata of 10:1. However, the evidence suggests that these workings have been backfilled as demonstrated by information contained upon the abandonment plan and from the results of rotary drilling (ROH1). No loss of flush was recorded during drilling in this borehole, which also supports the notion that separation of the overlying strata has not occurred.

It is considered that following removal of agricultural crops within the south east corner of the site, that additional detailed drilling is undertaken in the south east corner of the site, to further confirm the extent of workings and requirement for grouting in this area.

4.0 Fieldwork & Laboratory Testing

The ground investigation (including fieldwork, sampling and laboratory analysis) has been designed to identify and assess potential ground related problems and to allow cost-effective solutions to be advised. It has been planned on the basis of the desk study, site inspection and the proposed development layout. All fieldwork and soil descriptions were carried out in general accordance with relevant British Standards.

The following scope of fieldwork and laboratory analysis was undertaken:

- Machine excavated trial pits (66 No.) using a JCB 3CX type backhoe excavator to depths of up to 4.0m bgl to allow logging of soils, obtain samples for laboratory analysis and to undertake in situ tests;
- 10 No. window sampling boreholes to a maximum depth of 4.45m. Six of the window sample locations were installed with ground gas and groundwater monitoring points (WS101, WS102, WS103, WS104, WS202, WS401 and WS403).
- Drilling of rotary open hole boreholes (6 No.) using a tracked rotary percussive drill rig to depths of up to 46.20m bgl to determine the depth and thickness of coal seams and confirm whether abandoned mine workings are present below the site (reported under separate cover as detailed in section 1.4;
- Soakaway tests, in accordance with BRE365, were undertaken in 7 of the trial pits (TP114, TP227, TP228, TP303, TP403, TP501 and TP513);
- Geotechnical testing of soils, including water soluble sulphate, soil pH and Atterberg Limits;
- Contamination testing of made ground and topsoil to comprise standard suites of metals, metalloids, non-metals, hydrocarbons (PAH), and asbestos.

The ground investigation was undertaken between 13th and 24th June 2016.

A plan showing the location of the exploratory holes is included as Drawing No. N16055-704 in Appendix A and copies of the exploratory hole logs are provided in Appendix B.

Laboratory chemical and geotechnical Test results are included in Appendix C and D respectively.

4.1 Exploratory Hole Rationale

Based on the findings of the desk study and the preliminary Conceptual Site Model, exploratory hole locations were chosen based on the following rationale:

Location	Rationale
TP101, TP102 & WS101	Identification of anticipated made ground in area of former pond, possibly infilled
TP216	Identification of anticipated made ground in area of possible fly tipping
TP304	Identification of anticipated made ground in area of possible former occupation

Location	Rationale
TP114, TP227, TP228, TP303, TP403, TP501, TP513	Performance of infiltration tests
Remaining exploratory holes (TP & WS)	General site coverage
ROH1-ROH6	Location of coal seams and identification of possible abandoned mine workings below the site

Note: TP – trial pit, WS – window sample borehole, ROH – rotary open hole

5.0 Ground Conditions

A summary of the encountered strata in the trial pits is provided below:

Material Type	Depth to Top (Thickness Range) (m bgl)	Location
Topsoil	0.0m (0.15-0.45m)	All exploratory holes
Made ground: dark brown friable slightly sandy gravelly organic CLAY including fragments of glass, plastic, metal and corrugated sheet roofing	0.15-0.3m (0.15-1.95m)	Area south of former farm house, southeast corner
Glacial SAND	0.25-2.1m* (0.1-3.7m)	Predominantly in the north and north-west part of the site
Glacial Clay: Firm CLAY becoming soft to firm and thinly laminated with depth	0.25-3.1m* (0.1-3.5m)	All of the site with the exception of the NW

* full depth not proven in trial pit

5.1 Topsoil

Topsoil was encountered in all exploratory holes across the site and was recorded to comprise dark brown clayey organic SAND predominantly in the northwest and northeast of the site and dark brown friable sandy organic CLAY in the remaining areas of the site.

Eleven samples of topsoil were tested for water soluble sulphate and pH, which confirmed concentrations of between <10mg/l and 49mg/l with soil pH values of between 6.3 and 7.2.

5.2 Made Ground

Made ground was proven in four exploratory holes to a maximum depth of up to 2.10m bgl (TP102). To the south of the former farm house, made ground deposits were encountered in TP101, TP102 and WS101 and recorded to underlie the topsoil to depths between 0.45m and 2.10m bgl. The made ground comprised dark brown friable slightly sandy gravelly organic CLAY with numerous fragments of glass, plastic and metal. The gravel was noted to be of mixed lithologies including brick and concrete.

In the southeast corner of the arable field, made ground deposits were encountered in TP216 underlying the topsoil to a depth of 0.85m bgl. The made ground comprised dark brown sandy angular fine to coarse GRAVEL AND COBBLES of brick and concrete with numerous fragments of plastic and metal.

Two samples of made ground were tested for water soluble sulphate and pH, which confirmed concentrations of between <10mg/l and 19mg/l with soil pH values of between 6.5 and 6.6.

5.3 Natural Ground

5.3.1 Granular Soils

Glacial sands, light greyish brown to brown clayey sand and orange brown to brown SAND were predominantly encountered across the north and northwest of the site (300, 400 and 500 numbered series holes).

Standard penetration tests (SPTs) completed within the natural sand deposits recorded 'N' values between 2 and 5, confirming very loose to loose soils. The density generally increased with depth.

Six samples of natural sand were tested for water soluble sulphate and pH, confirming concentrations between 50mg/l and 80mg/l and soil pH between 6.5 and 7.4.

5.3.2 Glacial Clay

Glacial clay was found in the majority of the boreholes with the exception of the north and north-western areas of sand. The materials typically comprising grey to greyish brown slightly sandy CLAY, which generally becomes thinly laminated from approximately 1.5m to 2.5m bgl. The strength of the clay decreases with depth as the clay becomes laminated.

Nine samples of natural sand were tested for water soluble sulphate and pH, confirming concentrations between 30mg/l and 140mg/l and soil pH between 6.4 and 7.7.

Upper Clay

Hand shear vane results (HSV) in the upper 2m of soil, in non-laminated clay, ranged between 44-110kPa with an average of 77kPa. Discounting the lowest 20% of results, a characteristic value of undrained strength of 60kPa is recommended.

Modified Plasticity Index results ranged between 23 and 42, indicative of medium to high volume change potential.

Calculated values of Consistency Index range between 0.39 to 1.05, indicative of Firm to Very Stiff consistency.

Lower Laminated Clay

HSV results between approximately 2m and 4m depth in laminated clay recorded results between 20-100kPa with an average of 54kPa. A characteristic value of undrained strength of 40kPa is proposed.

Modified Plasticity Index results ranged between 17 and 30, indicative of low to medium volume change potential.

Calculated values of Consistency Index range between 0.48 to 83, indicative of a wide range of consistency between Soft and Stiff.

5.4 Bedrock

According to the findings of the rotary drilling works the rockhead depth varied across the site ranging from 26m bgl (ROH4) in the south west to 37.5m bgl (ROH1) in the south east. Rockhead in ROH1 and ROH2 in the south and east comprised mudstone, whilst sandstone was recorded in ROH3-ROH6 within the remainder of the site.

5.5 Groundwater

Groundwater was recorded in 13 no. of the exploratory locations during the investigation, at depths between 1.70m bgl (WS104 and TP406) and 2.20m bgl (TP214 and TP404). The groundwater seepages encountered are considered to be representative of a perched and inconsistent groundwater regime.

A summary is provided below:

Exploratory Hole	Depth (m bgl)	Description
TP206	2.0	Slight seepage of perched groundwater encountered within glacial till
TP207	2.0	
TP211	2.0	
TP214	2.2	
TP305	2.0	Slight seepage of perched groundwater encountered within glacial sand
TP401	2.0	
TP402	1.8	
TP404	2.2	
TP406	1.7	
WS101	1.9	Perched groundwater encountered in borehole within glacial sand
WS104	1.7	Perched groundwater encountered in borehole within glacial till
WS202	2.1	Perched groundwater encountered in borehole within glacial sand
WS401	2.0	
WS402	2.0	

To date, two monitoring visits have been undertaken, the results of which are summarised in the table below:

Exploratory Hole	Groundwater Monitoring Depth (m bgl)
WS101	1.34 - 1.61
WS102	1.28 - 1.28
WS104	1.02 - 1.16
WS202	1.44 - 1.56
WS401	1.58 - 1.63
WS403	1.44 - 1.47

5.6 Contamination – Visual and Olfactory

Evidence of suspected asbestos containing materials (ACMs) was encountered in one exploratory hole location during the ground investigation. In TP102, the encountered made ground deposits were noted to contain small to medium sized fragments of corrugated sheet roofing.

No other visual or olfactory evidence of contamination was noted across the site.

5.7 In-Ground Obstructions / Utilities

No man-made obstructions were encountered during the ground investigation. Made ground encountered in TP215 comprised cobble sized demolition arisings including brick and concrete. No significant natural obstructions were encountered within the glacial till.

A water main is anticipated to cross the site in the northwest corner. Although no services or obstructions have been encountered in TP302, signs along the west and north site boundary indicate the location of a 12-inch water main crossing the site in a northwest direction.

5.8 Infiltration Testing

Seven soil infiltration tests were performed in general accordance with BRE 365, 2007 at locations indicated in section 4.

The excavations were cut as square as possible and remained stable for the duration of the tests. The dimensions of each excavation were carefully recorded and logged prior to commencement of each test. Clean mains water was used in the tests, supplied in an agricultural water bowser.

Each test cycle was run for 120 minutes. Due to the observed poor infiltration rates the number of test cycles was reduced to one cycle per exploratory hole.

Based on the monitored water levels soil infiltration rates were calculated to be between 1.50×10^{-6} m/s and 7.49×10^{-5} m/s. The test results are presented in Appendix D.

5.9 Ground Gas Monitoring

A total of six ground gas and groundwater monitoring wells were installed during the investigation with response zones targeting natural soils between 1.00m and 3.00m bgl.

Gas and groundwater monitoring is presently ongoing and the full results and recommendations will be presented in an addendum report following the final visit. Copies of the results from one monitoring visits obtained to date are included in Appendix E.

A provisional summary and assessment of the monitoring information obtained to date (2 readings) is presented below.

Exploratory hole	Methane (% v/v)	Carbon Dioxide (% v/v)	Oxygen (% v/v)	Flow (l/hr)	Barometric Pressure (mb)	Maximum GSV*	
						CO ₂	CH ₄
WS101	13.9-16.5	10.7-12.9	0.2-1.3	0.0	1012	<0.07	<0.07
WS102	0.0	4.2-5.9	12.4-17.2	0.0	1012	<0.07	<0.07
WS104	0.0	0.5-2.8	18.2-19.8	0.0-0.2	1012	<0.07	<0.07
WS202	0.0	3.3-3.4	18.4-20.2	0.0	1012	<0.07	<0.07
WS401	0.0	3.7-4.2	17.6-16.6	0.0	1012	<0.07	<0.07
WS403	0.0	3.1-3.5	17.7-18.1	0.0	1012	<0.07	<0.07

* GSV: CIRIA C665 Gas Screening Value, based on maximum flow and concentration

6.0 Contamination Assessment

6.1 Generic Risk Assessment for Human Health

The assessment involves the screening of the measured concentrations of contaminants of concern obtained during the investigations against published generic assessment criteria (GAC) values which are representative of a "minimal" or "tolerable" risk to human health. The assessment criteria adopted are the LQM/CIEH Suitable for Use Levels (S4ULs) for Human Health Risk Assessment (Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL3279; All rights reserved). Where no S4UL is available, reference is made to other relevant standards as described in Appendix F.

Based on the proposed end use, GACs for a residential end use with plant uptake have been adopted. The soil organic matter content was calculated to be 6%, based on the average TOC concentration. A summary table of all chemical results is provided in Appendix F.

6.2 Soil Contamination

The chemical analysis has shown that there are a number of contaminants that are present above their respective GACs. These are summarised in the table below. Full results of chemical analyses undertaken are presented in Appendix C.

Determinand	GAC at 6% SOM (mg/kg)	Exceedances (mg/kg)	Locations
Lead	200	270	TP104 0.10m bgl
Benzo(a)pyrene	3.0	8.8	TP216 0.10m bgl
Benzo(b)fluoranthene	3.7	7.2	TP216 0.10m bgl
Dibenzo(a,h)anthracene	0.3	1.6	TP216 0.10m bgl

Lead Contamination: statistical analysis confirms that the highest recorded level of 270mg/kg is an outlier. However, as the materials comprise topsoil with no evidence of anthropogenic material, the results are considered to be part of the same dataset as the remaining topsoil and the calculated upper 95th percentile for the 15 samples analysed is 130mg/kg, below the adopted GAC. As such, lead is not considered to pose a significant risk to end users.

PAH contamination: statistics confirm that all elevated results from TP216 are outliers. Given that these PAHs are related to a thin topsoil cover overlying made ground in the south east corner of the site, it is considered that this material comprises a different averaging area and should be treated separately from the remainder of the site. Consequently it is considered that a potential risk to human health is present in this area.

Asbestos was detected in one of the samples analysed: Chrysotile cement sheet in TP102 at 0.4m bgl.

6.3 Risk to Controlled Waters

The underlying Pennine Middle Coal Measures are recorded as a Secondary (A) Aquifer, containing 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. However, these deposits are overlain by in excess of 30m of glacial till deposits, which are recorded as being Secondary (Undifferentiated) Aquifer and, whilst the variable nature of the till deposits may result in sub-horizontal permeable

layers, the vertical permeability of the till is considered to be negligible. As such it is considered that there is no pathway to the underlying Pennine Middle Coal Measures and thus no significant pollution linkage exists. It is further noted that the Coal Measures are worked in this area and therefore the groundwater is unlikely to be a sensitive receptor.

The glacial sand and gravel deposits in the northeast of the site are also recorded as being a Secondary (A) Aquifer, though the groundwater seepages encountered are considered to be representative of a perched and inconsistent groundwater regime. While the chemical analysis has indicated that there are some slightly elevated levels of contaminants, these are not considered to represent a significant source of gross contamination. In addition, there are no groundwater abstraction licences, surface water abstraction licences or potable water abstraction licences within 2000m of the site and no source protection zones within 500m of the site; as such it is considered that there are no sensitive receptors in the region that could be impacted.

Consequently, a significant pollution linkage is not deemed to be present for controlled waters in the glacial sand and gravels and it is considered that the site does not pose a significant risk to controlled waters.

7.0 Revised Conceptual Site Model

The chemical analysis has shown that the GACs for residential end-use with plant uptake have been exceeded for the PAHs Benzo(a)pyrene, Benzo(b)fluoranthene and Dibenzo(a,h)anthracene. In addition, asbestos was encountered in the made ground adjacent to Whinney Hill Farm. Full results of the chemical analysis are presented in Appendix C.

The primary receptors are end-users of the residential development and construction workers. The pathways include direct contact with contaminated soil and soil dust, ingestion of contaminated soil and dust, and the indoor/outdoor inhalation of ground gas and soil vapour. It is considered that the site may pose an unacceptable risk to end-users of the proposed residential development.

In terms of controlled waters, the primary receptors are the underlying Secondary (A) Aquifers. The main pathway would be through leaching and groundwater transport. Based on the findings of the Phase II ground investigation it is considered that the site does not pose a significant risk to controlled waters.

The Phase II conceptual model is illustrated below:

Human Health			
Source	Pathway	Receptor	Pollutant Linkage
Localised Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenzo(a,h)anthracene and Asbestos	Direct contact and ingestion/inhalation of contaminated soil and dust	Construction workers	Yes, due to the presence of asbestos in made ground adjacent to Whinney Hill Farm. Mitigation measures such as use of appropriate PPE/RPE and good site practice will be required.
	Direct contact and ingestion/inhalation of contaminated soil and dust. Ingestion of home grown vegetables	End users	Yes although generally low levels of contaminants were recorded. Mitigation measures are required as part of the development; localised soils removal and clean capping in garden areas.
Ground gas associated with made ground (ponds/ off-site landfill deposits and coal mining).	Vertical and lateral migration into confined spaces. Inhalation	End users	Yes. Gas monitoring is required to confirm the ground gas regime particularly with regard to mine gases and the made ground in the vicinity of WS101.
Controlled Waters			
No significant source identified	Vertical and lateral migration	Secondary (A) Aquifer (glacial sand and gravel). Secondary A Aquifer (bedrock geology).	No significant pollution linkage identified

8.0 Remediation

8.1 Protection of End-Users – Soils

The chemical analysis has identified an isolated area of PAH contamination, namely Benzo(a)pyrene, Benzo(b)fluoranthene and Dibenzo(a,h)anthracene in the south east corner of the site, where the fly-tipped made ground is located (TP216). Asbestos was also identified in the made ground adjacent to Whinney Hill Farm (TP102). As such remediation is considered necessary in localised areas. It is considered that the most appropriate form of remediation will be as follows:

- Asbestos in TP102: delineation of affected soils and off-site disposal.
- PAH contamination in TP216: Either remove the localised made ground soils off site or provide an appropriate thickness of clean covers soils (600mm) in domestic gardens.

Based on the available results it is considered that the majority of on-site soils are suitable for re-use as capping across the development, as such it will be unlikely to import material to site. Any soil imported for use in the capping layer will be chemical validated to ensure it is suitable for residential end-use. The chemical validation suites and testing rates are shown in the table below:

Source and Validation Rate	Chemical Analysis Suite (Imported Soil)		
	General Soil Suite	Asbestos	Hydrocarbons (TPHCWG)
Greenfield Source 1 per 150m ³	✓		
Brownfield Source 1 per 100m ³	✓	✓	✓
Generated Soil 1 per 50m ³	✓	✓	✓

The results of the chemical validation will be compared against the GAC for residential end-use with plant uptake as defined in a remediation strategy for the site.

Once the soil has been chemically validated its depth should be checked to ensure that the required 600mm of clean cover is present in private gardens, this should be undertaken at a rate of one hand dug pit per two plots.

8.2 Protection of End-Users – Ground Gas

Gas monitoring is on-going; however, based on the results of 2 visits completed it is considered that gas protection measures will be required due to the presence of elevated methane and carbon dioxide. At this stage allowance should be made for the use of a gas resistant membrane in all plots, this should be extended across cavities and sealed around service entries.

The preliminary assessment indicates that the gas regime conforms to Characteristic Situation 2 or NHBC Amber 2 (for suspended floors with 150mm void). The elevated levels of methane were restricted to a single monitoring standpipe and consequently it may be possible to divide the site into zones, with a lower standard of protection away from the area of elevated methane, subject to local authority approval.

8.3 Protection of Construction Workers

Specific remediation to protect construction workers is required when removing the made ground in the vicinity of Whinney Hill Farm; advice should be sought from a specialist asbestos contractor. For

the remainder of the site specific remediation to protect construction workers is not required; however, suitable personal protective equipment in line with the ground workers risk assessment should be adopted.

8.4 Protection of Controlled Waters

It is considered that the site does not pose a significant risk to controlled waters; as such remediation to protect controlled waters is not required.

8.5 Waste Disposal Classification

A fragment of asbestos cement board has been encountered in the made ground located adjacent to Whinney Hill Farm (TP102); this material will therefore be classified as hazardous waste if discarded. Based on the site history and the results currently available it is considered that should any natural strata require removal from site it should generally be suitable for disposal as non-hazardous or inert. However, this needs to be confirmed with the receiving landfill and additional testing may be required.

9.0 Geotechnical Considerations

9.1 Introduction

The current development proposals indicate some 300 No. residential units are to be constructed. The development will also incorporate private gardens, access roads, car parking and areas of soft landscaping.

9.2 Excavation Conditions

Excavation of the soils encountered during the ground investigation should be easily achieved using conventional hydraulic equipment.

Made ground was encountered in two areas; to the south of Whinney Hill Farm (TP101, TP102 and WS101) and at the southwest corner of the site (TP216), adjacent to the residential development. Glacial sands were encountered in north and northwest of the site and were also found in the south west corner of the site. The Glacial Till was frequently found to be soft and laminated with depth. Because of this it should be assumed that collapse may occur in excavations in many areas of the site and allowance should be made for the use of trench support. Full support should be provided to any excavation to which man entry is required.

Based on the site observations, it is considered that dewatering of excavations is unlikely to be required. However, sump pumping should be sufficient to control ingress in shallow excavations if encountered.

9.3 Mine workings and shafts.

The previous PP report (Phase I Geoenvironmental Desk Study and Coal Mining Risk Assessment Whinney Hill, Guide Post, Northumberland, Ref: N16055, March 2016) suggested a moderate risk of shallow coal mine workings, which could potentially impact the development at surface, mainly in the south east. The rotary investigation confirmed:

- In the south east of the site coal seams have been found at a depth of 36m bgl and evidence of potential goafed (backfilled) workings were recorded at a depth of 42m bgl which coincides with pillar and stall workings on mine abandonment plans for the High Main (E) seam.
- It is believed that an area of probable workings associated with the crop of the combined High Main (E) and Metal (F1) seams crosses the site in the east.

These shallow mine workings will require grouting prior to development.

It is recommended that detailed drilling work is undertaken in the southeast of the site, following harvesting of the agricultural crops, to further confirm the extent of workings and requirement for grouting in this area.

9.4 Foundations

The two areas of made ground, to the south of Whinney Hill Farm (TP101, TP102 and WS101) and at the southwest corner of the site (TP216), are considered unsuitable for the use of conventional spread foundations and all foundations must therefore extend below this material to found on suitable ground.

9.4.1 Foundations in Sand

The sand deposits primarily located in the north of the site were recoded to be generally loose in nature. As such it is considered that ground improvement should be carried out with building loads supported via strip footings on vibro stone columns. A specialist contractor should be consulted in this regard.

9.4.2 Foundations in Clay and Laminated Clay

The cohesive soils are noted to be stronger in the upper 2m and becoming softer with depth, generally associated with the soils becoming thinly laminated. An assessment of bearing pressures with depth suggests that the soils would have sufficient strength to support lightly loaded structures. However, the presence of both high moisture content and plasticity index suggests that the materials may be prone to excessive consolidation settlement. Preliminary calculations indicate that settlement may exceed 25mm for strip footings.

Based on the above, it is recommended that ground improvement should be carried out with building loads supported via strip footings on vibro stone columns. It is considered that the soils have adequate undrained shear strength for this method to be effective, but very occasional high (>40) plasticity index values were recorded which may be detrimental to this form of ground improvement. A specialist contractor should be consulted in this regard and it may be necessary to carry out further plasticity assessments to confirm the suitability of this method.

If stone columns cannot be utilised, piled foundations should be considered.

The volume change potential of the clay should be considered in the design of the foundations and floor slabs, particularly in the vicinity of existing or proposed planting.

9.5 Floor Slabs

As the preferred option is vibro stone columns, fully suspended floor slabs should be adopted in line with NHBC recommendations.

9.6 Slope Stability

The site rises steadily in elevation from the south east (c. 15m AOD) to the north west (c.33m AOD); slope stability is not considered to be an issue although some cut and fill may be necessary to create level development areas.

9.7 Soakaway Drainage

Based on the monitored water levels soil infiltration rates were calculated to be between 1.50×10^{-6} m/s and 7.49×10^{-5} m/s. However, due to the presence of deep deposits of relatively low permeability glacial clay and the groundwater encountered at relatively shallow depths, it is considered that soakaways may function poorly over an extended period of time.

9.8 New Access Roads

It is assumed that the proposed development will include access roads. For indicative purposes the near-surface untreated soils are likely to provide CBR values of <5%; the actual CBR values of the soils should be confirmed at formation level by in-situ plate load tests.

9.9 Water Supply Pipes

Based on the site history and the site chemical analysis completed it considered that site is suitable for standard PE/PVC water pipes, subject to confirmation from the utility provider.

9.10 Buried Concrete

Based on the recorded water soluble sulphate (<500mg/l) and pH (>5.5) the topsoil and natural glacial soils below the site (assuming mobile groundwater conditions) may be assumed as DS-1 and the ACEC Class as AC-1 (in accordance with BRE Special Digest 1 (2005)).

In the localised area of made ground soils south of the former farm house (TP101, TP102), concrete should be designed in accordance with DS-1 and ACEC-2z.

10.0 Further Investigation

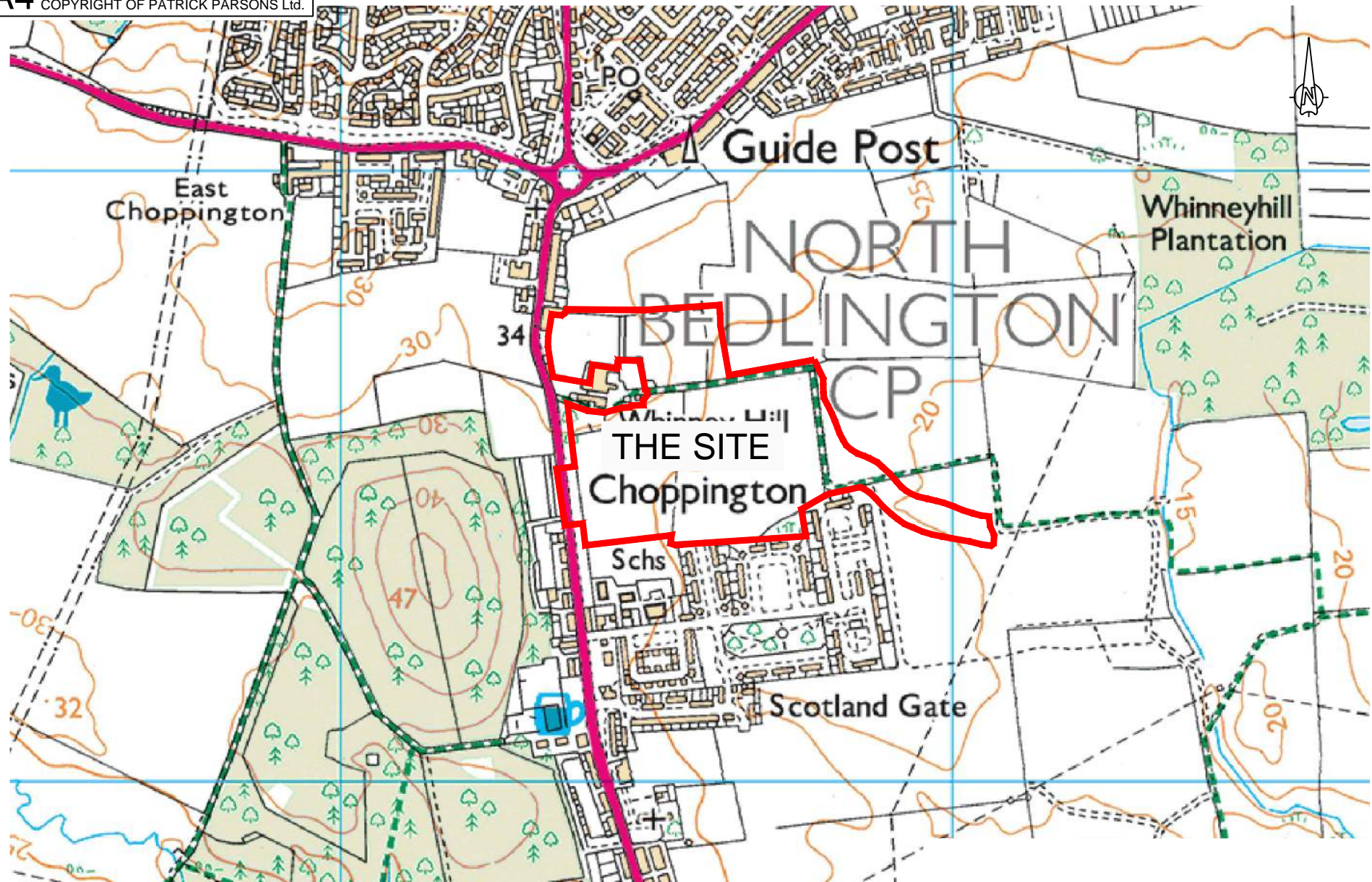
10.1 Further works are required as follows:


- The gas monitoring programme should be completed and the gas risk assessment updated (ongoing).
- Detailed drilling work should be undertaken in the southeast of the site, following harvesting of the agricultural crops, to further confirm the extent of workings and requirement for grouting in this area.

10.2 Following review of this report a copy of it should be submitted to the Local Authority planning department prior to any development works as this is often a condition of planning.

Appendix A

Figures



 PATRICK PARSONS T. +44 (0)191 261 9000 E. info@patrickparsons.co.uk W. www.patrickparsons.co.uk	Client DYSART DEVELOPMENTS LTD	Drawing SITE LOCATION PLAN	Scales NTS	Drawn JCF MAR 2016	Checked SHJ
	Project WHINNEY HILL, GUIDE POST, NORTHUMBERLAND		Drawing No. N16055-701	Rev. P1	



LEGEND

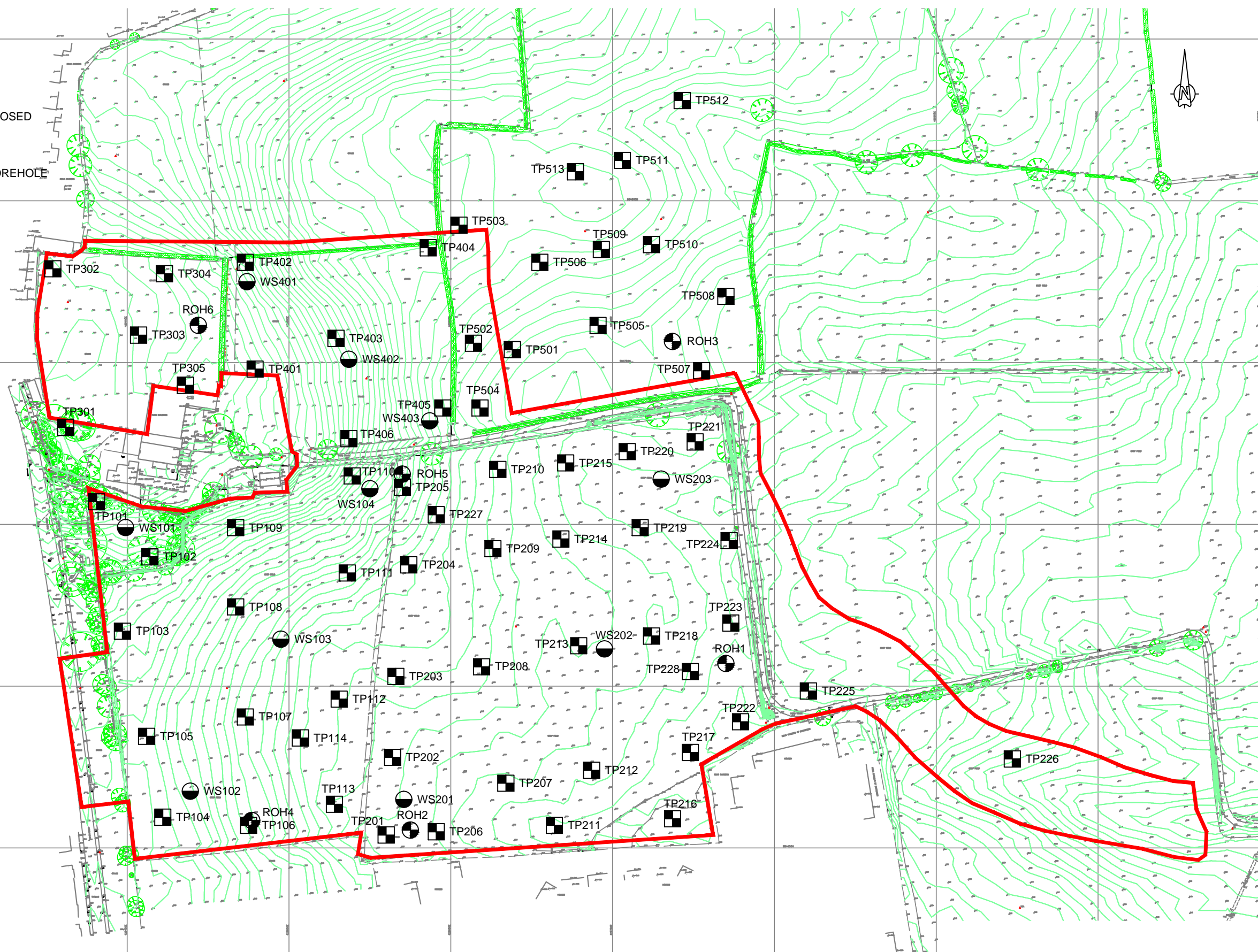


APPROXIMATE PROPOSED
DEVELOPABLE AREA

WS1 WINDOW SAMPLE BOREHOLE

TP1 TRIAL PIT

	ROH1	ROTARY OPEN HOLE
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E. info@patrickparsons.co.uk
W. www.patrickparsons.co.uk

Client **DYSART DEVELOPMENTS LTD**

Project
WHINNEY HILL, GUIDE POST,
NORTHUMBERLAND

Drawing

EXPLORATORY HOLE LOCATION PLAN

Scales 1 : 2500

Drawn JCF
JUNE 2016

Checked	SHJ
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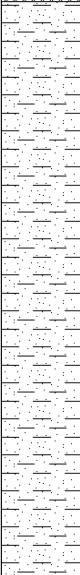
Drawing No. **N16055-704**

Rev. **P1**



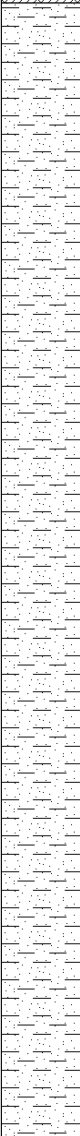

Appendix B


Exploratory Hole Logs



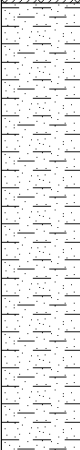
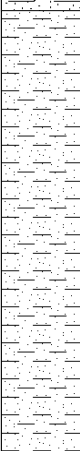
				<h1>Trial Pit Log</h1>			Trial Pit No. TP101 Sheet 1 of 1		
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425381E - 584614N		Date	
						Level (m AOD): 33.10		13/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 4.00	Pit Length (m): 2.50		Scale 1:25
Client: Dysart Developments							Pit Width (m): 0.66		Logged By TD
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
	0.10	ES					Grass over dark brown friable slightly sandy organic CLAY with numerous rootlets. (TOPSOIL)		
	0.40	ES		0.30	32.80		Dark brown friable slightly sandy gravelly organic CLAY with numerous fragments of glass plastic and metal.		
	0.60	D		0.45	32.65		Sand is fine to coarse. Gravel is angular to sub-angular fine to coarse of mixed lithologies including brick and concrete. (MADE GROUND)		
							'Loose' greyish light brown clayey fine SAND with widely spaced pockets of 'soft to firm' sandy CLAY. (GLACIAL SAND)		
	3.20	D							
				4.00	29.10		End of Pit at 4.00m		
<div>Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.</div> <div>Pit Stability: Pit remained stable during excavation.</div>									

				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP102 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425414E - 584580N Level (m AOD): 30.60		Date 13/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 4.00		Pit Length (m): 2.50 Pit Width (m): 0.66	
Client: Dysart Developments								Scale 1:25 Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
	0.10	ES		0.15	30.45		Grass over dark brown friable slightly sandy organic CLAY with numerous rootlets. (TOPSOIL)		
	0.40	ES					Dark brown friable slightly sandy gravelly organic CLAY with numerous fragments of glass plastic metal and corrugated sheet roofing. Sand is fine to coarse. Gravel is angular to sub-angular fine to coarse of mixed lithologies including brick and concrete. (MADE GROUND)		
	2.50	D HSV	70kPa	2.10	28.50		'Firm' grey sandy CLAY. Sand is fine. (GLACIAL TILL)		
	2.50								
	3.00	HSV	62kPa						
	3.50	HSV	54kPa						
4.00	HSV	62kPa	4.00	26.60	End of Pit at 4.00m				
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									




				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP103 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425397E - 584534N Level (m AOD): 28.70		Date 13/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 4.00		Pit Length (m): 2.50 Pit Width (m): 0.66	
Client: Dysart Developments								Scale 1:25 Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
	0.10	ES		0.25	28.45		Grass over dark brown friable slightly sandy organic CLAY with numerous rootlets. (TOPSOIL)		
	0.25	CBR	2%						
	0.33	CBR	5%						
	0.40	CBR	6%						
	0.48	CBR	4%						
	0.50	HSV	70kPa						
	0.55	CBR	4%						
	0.63	CBR	4%						
	0.70	CBR	4%						
	0.78	CBR	4%						
	1.00	HSV	66kPa				'Stiff' greyish brown slightly sandy closely fissured CLAY. Sand is fine. (GLACIAL TILL) <i>Becomes firm from 2.10m bgl.</i>		
	1.50	HSV	80kPa						
	2.00	HSV	70kPa						
	2.50	D							
	2.50	HSV	60kPa						
3.00	HSV	54kPa				End of Pit at 4.00m			
3.50	HSV	56kPa							
4.00	HSV	60kPa							
			4.00	24.70					
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									













				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP104 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425422E - 584419N Level (m AOD): 27.80		Date 13/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 4.00		Pit Length (m): 2.50 Pit Width (m): 0.66	
Client: Dysart Developments								Scale 1:25 Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
	0.10	ES		0.25	27.55		Grass over dark brown friable slightly sandy organic CLAY with numerous rootlets. (TOPSOIL)		
	0.25	CBR	2%						
	0.33	CBR	3%						
	0.40	CBR	2%						
	0.48	CBR	2%						
	0.50	HSV	50kPa						
	0.55	CBR	3%						
	0.63	CBR	4%						
	0.70	CBR	3%						
	0.75	HSV	70kPa	1.75	26.05		'Stiff' light brown mottled slightly sandy CLAY. Sand is fine. (GLACIAL TILL)		
	0.78	CBR	3%						
	1.50	HSV	70kPa						
	2.75	HSV	46kPa						
	3.00	HSV	40kPa						
	3.50	HSV	52kPa						
4.00	HSV	54kPa	2.50	25.30		'Firm' greyish brown laminated CLAY with very closely spaced fine sand partings and occasional wood fragments. (GLACIAL TILL)			
						End of Pit at 4.00m			

Remarks: Trial pit complete at 4.00m bgl.
No groundwater encountered.
Backfilled with arisings upon completion.



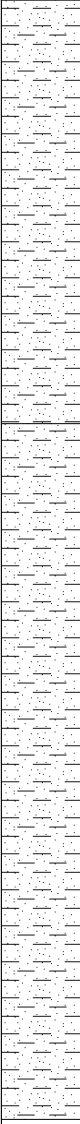
Pit Stability: Pit remained stable during excavation.






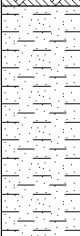
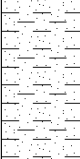
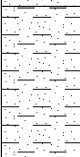
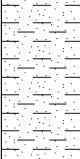

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Project Name: Whinney Hill				Project No. N16055		Co-ords: 425412E - 584469N Level (m AOD): 27.80		Date 14/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 4.00		Pit Length (m): 2.50 Pit Width (m): 0.66	
Client: Dysart Developments								Scale 1:25 Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
							Grass over dark brown friable slightly sandy organic CLAY with numerous rootlets. (TOPSOIL)		
	0.30	CBR	4%	0.30	27.50		'Stiff' light brown mottled slightly sandy CLAY. Sand is fine. (GLACIAL TILL)		
	0.38	CBR	4%						
	0.45	CBR	4%						
	0.50	D							
	0.50	HSV	60kPa	0.75	27.05		'Stiff' greyish brown CLAY. (GLACIAL TILL)		
	0.53	CBR	3%						
	0.60	CBR	3%						
	0.68	CBR	3%						
	0.75	CBR	3%						
	0.83	CBR	6%						
	1.00	HSV	62kPa						
	1.50	HSV	68kPa				'Firm' greyish brown laminated CLAY with very closely spaced fine sand partings and occasional wood fragments. (GLACIAL TILL)		
	1.85	D		1.80	26.00				
2.00	HSV	80kPa							
							'Soft' grey laminated CLAY. (GLACIAL TILL)		
2.50	HSV	28kPa	2.20	25.60					
3.00	HSV	34kPa							
3.50	HSV	32kPa							
4.00	HSV	32kPa	4.00	23.80		End of Pit at 4.00m			
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									























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Project Name: Whinney Hill				Project No. N16055		Co-ords: 425473E - 584481N Level (m AOD): 25.80		Date 13/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 4.00		Pit Length (m): 2.50 Pit Width (m): 0.66	
Client: Dysart Developments								Scale 1:25 Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
	0.10	ES		0.30	25.50		Grass over dark brown friable slightly sandy organic CLAY with numerous rootlets. (TOPSOIL)		
	0.30	CBR	2%				'Firm' light brown mottled slightly sandy CLAY. Sand is fine. (GLACIAL TILL)		
	0.38	CBR	2%						
	0.45	CBR	3%						
	0.50	HSV	50kPa						
	0.53	CBR	4%						
	0.60	CBR	4%						
	0.60	D							
	0.68	CBR	4%						
	0.75	CBR	4%						
	0.83	CBR	6%						
	1.00	HSV	70kPa						
	1.50	HSV	70kPa	1.70	24.10		'Firm' greyish yellowish brown laminated CLAY with very closely spaced fine sand partings and occasional wood fragments. (GLACIAL TILL)		
	2.00	HSV	46kPa						
	2.50	HSV	42kPa						
3.00	HSV	40kPa							
3.50	HSV	52kPa							
4.00	HSV	54kPa	4.00	21.80		End of Pit at 4.00m			
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									



				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP108 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425467E - 584549N Level (m AOD): 26.90		Date 14/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 4.00		Pit Length (m): 2.50 Pit Width (m): 0.66	
Client: Dysart Developments								Scale 1:25 Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
				0.30	26.60		Grass over dark brown friable slightly sandy organic CLAY with numerous rootlets. (TOPSOIL)		
	0.30	CBR	3%	0.30	26.60		'Firm' light brown mottled slightly sandy CLAY. Sand is fine. (GLACIAL TILL)		
	0.38	CBR	4%						
	0.45	CBR	4%						
	0.50	HSV	88kPa						
	0.53	CBR	4%						
	0.60	CBR	3%						
	0.68	CBR	4%						
	0.75	CBR	4%						
	0.83	CBR	3%						
	1.00	HSV	80kPa	1.60	25.30		'Soft' greyish yellowish brown laminated CLAY with very closely spaced fine sand partings and occasional wood fragments. (GLACIAL TILL)		
	1.50	HSV	98kPa						
	2.00	HSV	42kPa						
	2.50	HSV	28kPa						
	3.00	HSV	36kPa	3.00	32kPa				
3.50	HSV	32kPa							
4.00	HSV	40kPa							
4.00	HSV	40kPa	4.00	22.90		End of Pit at 4.00m			
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									


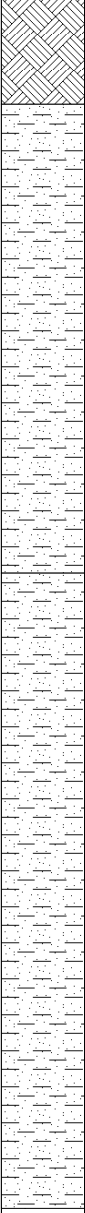
				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP109 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425467E - 584597N Level (m AOD): 29.20		Date 14/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 4.00		Pit Length (m): 2.50 Pit Width (m): 0.66	
Client: Dysart Developments								Scale 1:25 Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
	0.10	ES		0.25	28.95		Grass over dark brown friable slightly sandy organic CLAY with numerous rootlets. (TOPSOIL)		
	0.25	CBR	4%				'Loose' orange brown clayey fine SAND. (GLACIAL SAND)		
	0.33	CBR	4%						
	0.40	CBR	4%						
	0.48	CBR	3%						
	0.50	D		0.80	28.40		'Firm' greyish brown very sandy CLAY. Sand is fine. (GLACIAL TILL)		
	0.55	CBR	2%						
	0.63	CBR	2%						
	0.70	CBR	2%						
	0.78	CBR	2%						
	1.00	HSV	72kPa	1.70	27.50		'Soft' dark grey CLAY. (GLACIAL TILL)		
	1.50	D							
	1.50	HSV	72kPa						
	2.00	HSV	38kPa						
	2.50	HSV	42kPa						
3.00	HSV	38kPa	4.00	25.20		End of Pit at 4.00m			
3.50	HSV	44kPa							
4.00	HSV	40kPa							
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									





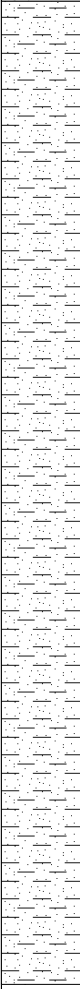
				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP110 Sheet 1 of 1			
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425539E - 584630N Level (m AOD): 28.60		Date 14/06/2016			
Location: Guide Post, Northumberland						Final Depth (m):		Pit Length (m): 2.50			
Client: Dysart Developments						4.00		Pit Width (m): 0.66			
								Scale 1:25			
								Logged By TD			
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description				
	Depth (m bgl)	Type	Results								
	0.10	ES					Grass over dark brown friable slightly sandy organic CLAY with numerous rootlets. (TOPSOIL)				
	0.30	CBR	1%	0.30	28.30		'Firm' greyish brown sandy CLAY. Sand is fine. (GLACIAL TILL)				
	0.38	CBR	1%								
	0.45	CBR	2%								
	0.50	HSV	68kPa								
		0.53	CBR	3%	0.65	27.95		'Loose' orange brown clayey fine SAND. (GLACIAL SAND)			
	0.60	CBR	3%								
	0.68	CBR	2%								
	0.75	CBR	2%								
	0.83	CBR	3%								
				1.20	27.40		'Soft' dark grey CLAY. (GLACIAL TILL)				
		1.50	HSV	50kPa							
	2.00	HSV	34kPa								
	2.50	HSV	32kPa								
	3.00	HSV	40kPa								
	3.50	HSV	42kPa								
	4.00	HSV	44kPa	4.00	24.60		End of Pit at 4.00m				
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.											
Pit Stability: Pit remained stable during excavation.											





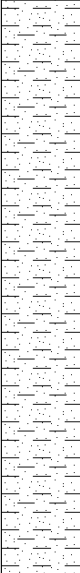



				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP112 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425531E - 584492N Level (m AOD): 24.50		Date 14/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 4.00		Pit Length (m): 2.50 Pit Width (m): 0.66	
Client: Dysart Developments								Scale 1:25 Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
				0.35	24.15		Grass over dark brown friable slightly sandy organic CLAY with numerous rootlets. (TOPSOIL)		
	0.35	CBR	2%				'Firm' light brown mottled slightly sandy CLAY. Sand is fine. (GLACIAL TILL)		
	0.43	CBR	2%						
	0.50	CBR	3%						
	0.50	HSV	66kPa						
	0.58	CBR	2%						
	0.65	CBR	2%						
	0.73	CBR	3%						
	0.80	CBR	3%						
	0.88	CBR	2%						
	1.00	HSV	54kPa						
	1.50	HSV	74kPa						
	2.00	HSV	60kPa	1.90	22.60		'Soft' greyish yellowish brown laminated CLAY with very closely spaced fine sand partings and occasional wood fragments. (GLACIAL TILL)		
	2.50	HSV	62kPa						
	2.75	D							
3.00	HSV	36kPa							
	3.50	HSV	44kPa			End of Pit at 4.00m			
	4.00	HSV	50kPa	4.00	20.50				
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									



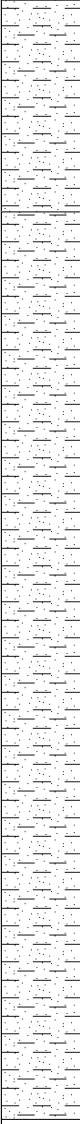



				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP113 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425528E - 584427N Level (m AOD): 24.20		Date 13/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 4.00		Pit Length (m): 2.50 Pit Width (m): 0.66	
Client: Dysart Developments								Scale 1:25 Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
	0.10	ES		0.30	23.90		Grass over dark brown friable slightly sandy organic CLAY with numerous rootlets. (TOPSOIL)		
	0.30	CBR	2%				'Loose' light brown clayey fine to coarse SAND. (GLACIAL SAND)		
	0.38	CBR	2%						
	0.45	CBR	3%						
	0.50	D							
	0.53	CBR	3%						
	0.60	CBR	3%						
	0.68	CBR	4%						
	0.75	CBR	4%						
	0.83	CBR	5%	4.00	20.20		End of Pit at 4.00m		
	1.00	HSV	63kPa						
	1.50	HSV	52kPa						
	2.00	HSV	64kPa						
	2.50	HSV	50kPa						
	3.00	HSV	68kPa						
3.50	HSV	70kPa							
4.00	HSV	68kPa							
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									


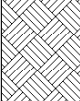
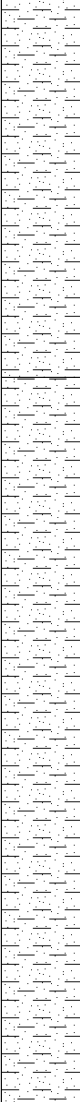


				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP114 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425507E - 584468N Level (m AOD): 24.70		Date 24/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 2.50		Pit Length (m): 2.50 Pit Width (m): 0.66	
Client: Dysart Developments								Scale 1:25 Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
	0.30	CBR	2%	0.30	24.40		Grass over dark brown friable slightly sandy organic CLAY with numerous rootlets. (TOPSOIL)		
	0.38	CBR	2%						
	0.45	CBR	2%						
	0.50	HSV	66kPa						
	0.53	CBR	2%						
	0.60	CBR	2%						
	0.68	CBR	2%						
	0.75	CBR	2%						
	0.83	CBR	3%						
	1.00	HSV	54kPa				'Firm' light brown mottled slightly sandy CLAY. Sand is fine. (GLACIAL TILL)		
1.50	HSV	74kPa							
2.00	HSV	60kPa							
	2.50	HSV	34kPa	2.20	22.50		'Soft' greyish yellowish brown laminated CLAY with very closely spaced fine sand partings and occasional wood fragments. (GLACIAL TILL)		
			2.50	22.20					
							End of Pit at 2.50m		
Remarks: Trial pit complete at 2.50m bgl. No groundwater encountered. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									



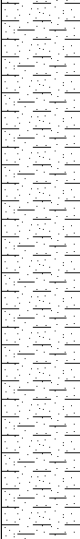



				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP201 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425560E - 584408N Level (m AOD): 23.90		Date 14/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 4.00		Pit Length (m): 2.50 Pit Width (m): 0.66	
Client: Dysart Developments								Scale 1:25 Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
	0.10	ES					Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)		
	0.30	CBR	1%	0.30	23.60		'Firm' greyish brown slightly sandy very closely fissured CLAY. Sand is fine. (GLACIAL TILL)		
	0.38	CBR	1%						
	0.45	CBR	2%						
	0.50	HSV	76kPa						
	0.53	CBR	3%						
	0.60	CBR	2%						
	0.68	CBR	2%						
	0.75	CBR	2%						
	0.83	CBR	2%						
	1.00	HSV	90kPa	1.00	22.90				
	1.20	D					'Firm' greyish orange brown laminated CLAY with very closely spaced fine sand partings and occasional wood fragments. (GLACIAL TILL)		
	1.50	HSV	92kPa						
	2.00	HSV	82kPa						
	2.50	HSV	32kPa						
	3.00	HSV	40kPa						
	3.50	HSV	42kPa						
	4.00	HSV	48kPa	4.00	19.90				
End of Pit at 4.00m									
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									




				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP202 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425564E - 584456N Level (m AOD): 24.10		Date 14/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 4.00		Pit Length (m): 2.50 Pit Width (m): 0.66	
Client: Dysart Developments								Scale 1:25 Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
	0.35	CBR	1%	0.35	23.75		Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)		
	0.43	CBR	1%				'Firm' greyish brown slightly sandy very closely fissured CLAY. Sand is fine. (GLACIAL TILL)		
	0.50	CBR	2%						
	0.50	HSV	70kPa						
	0.58	CBR	1%						
	0.65	CBR	2%						
	0.73	CBR	2%						
	0.80	CBR	3%						
	0.88	CBR	3%						
	1.00	HSV	88kPa						
	1.50	HSV	88kPa	1.60	22.50		'Firm' greyish orange brown laminated CLAY with very closely spaced fine sand partings and occasional wood fragments. (GLACIAL TILL)		
	2.00	HSV	80kPa						
	2.50	HSV	32kPa						
	3.00	HSV	40kPa						
	3.50	HSV	42kPa						
	4.00	HSV	48kPa	4.00	20.10		End of Pit at 4.00m		
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									



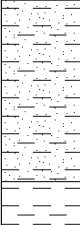
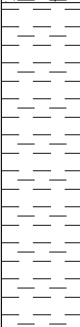
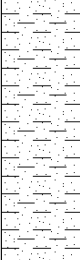
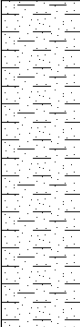



				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP203 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425566E - 584506N Level (m AOD): 24.60		Date 14/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 4.00		Pit Length (m): 2.50 Scale 1:25	
Client: Dysart Developments						Pit Width (m): 0.66		Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
	0.10	ES		0.30	24.30		Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)		
	0.30	CBR	1%						
	0.38	CBR	1%						
	0.45	CBR	2%						
	0.50	HSV	72kPa						
	0.53	CBR	3%						
	0.60	CBR	2%						
	0.68	CBR	2%						
	0.75	CBR	2%						
	0.83	CBR	2%						
	1.00	HSV	86kPa						
	1.50	HSV	60kPa	2.10	22.50		'Firm' greyish brown slightly sandy very closely fissured CLAY. Sand is fine. (GLACIAL TILL)		
	2.00	HSV	70kPa						
	2.50	HSV	32kPa						
	3.00	HSV	40kPa						
3.50	HSV	42kPa							
4.00	HSV	48kPa	4.00	20.60		End of Pit at 4.00m			







Remarks: Trial pit complete at 4.00m bgl.
No groundwater encountered.
Backfilled with arisings upon completion.


Pit Stability: Pit remained stable during excavation.




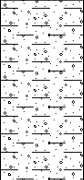
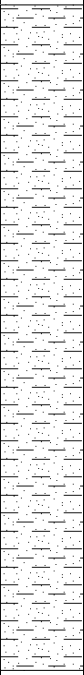


				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP204 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425574E - 584575N Level (m AOD): 25.10		Date 17/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 4.00		Pit Length (m): 2.50 Pit Width (m): 0.66	
Client: Dysart Developments								Scale 1:25 Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
							Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)		
	0.30	CBR	1%	0.30	24.80		'Firm' greyish brown mottled slightly sandy CLAY. Sand is fine. (GLACIAL TILL)		
	0.38	CBR	1%						
	0.45	CBR	2%						
	0.50	HSV	72kPa						
	0.53	CBR	1%						
	0.60	CBR	2%						
	0.68	CBR	2%						
	0.75	CBR	3%						
	0.83	CBR	3%	0.90	24.20		'Firm' greyish brown CLAY. (GLACIAL TILL)		
	1.00	HSV	80kPa						
	1.50	HSV	78kPa	2.00	23.10		'Soft' greyish brown laminated CLAY with very closely spaced fine sand partings and occasional wood fragments. (GLACIAL TILL)		
	2.25	B							
	2.25	HSV	88kPa						
	2.50	HSV	48kPa						
3.00	HSV	40kPa							
3.50	HSV	42kPa	2.90	22.20		'Soft' grey silty sandy CLAY. Sand is fine. (GLACIAL TILL)			
4.00	HSV	60kPa							
			4.00	21.10		End of Pit at 4.00m			
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									




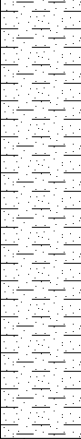


				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP205 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425570E - 584623N Level (m AOD): 26.50		Date 17/06/2016	
Location: Guide Post, Northumberland						Final Depth (m):		Pit Length (m): 2.50	
Client: Dysart Developments						4.00		Pit Width (m): 0.66	
								Scale 1:25	
								Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
	0.10	ES		0.25	26.25		Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)		
	0.25	CBR	1%				'Loose' light brown clayey fine SAND. (GLACIAL SAND)		
	0.33	CBR	1%						
	0.40	CBR	2%						
	0.48	CBR	3%						
	0.50	D							
	0.55	CBR	2%	0.60	25.90		'Firm' greyish reddish brown widely fissured CLAY. (GLACIAL TILL)		
	0.63	CBR	2%						
	0.70	CBR	2%						
	0.78	CBR	2%						
	1.00	HSV	74kPa	2.40	24.10				
	1.25	D							
	1.50	HSV	74kPa						
	2.00	HSV	50kPa						
	2.50	HSV	40kPa						
3.00	HSV	40kPa	4.00	22.50		'Soft' greyish brown laminated CLAY with very closely spaced fine sand partings and occasional wood fragments. (GLACIAL TILL)			
3.50	HSV	38kPa							
4.00	HSV	46kPa							
						End of Pit at 4.00m			
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									



				<h1 style="text-align: center;">Trial Pit Log</h1>			Trial Pit No. TP206 Sheet 1 of 1								
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425591E - 584410N Level (m AOD): 23.70		Date 16/06/2016							
Location: Guide Post, Northumberland						Final Depth (m): 4.00		Pit Length (m): 2.50 Pit Width (m): 0.66		Scale 1:25 Logged By TD					
Client: Dysart Developments															
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description								
	Depth (m bgl)	Type	Results												
	0.30	CBR	2%	0.30	23.40		Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)					<div style="text-align: center;">1</div> <div style="text-align: center;">2</div> <div style="text-align: center;">3</div> <div style="text-align: center;">4</div> <div style="text-align: center;">5</div>			
	0.38	CBR	3%												
	0.45	CBR	2%												
	0.50	HSV	72kPa												
	0.53	CBR	2%												
	0.60	CBR	FAIL												
	1.00	HSV	76kPa	0.90	22.80		'Firm' grey mottled light brown sandy slightly gravelly CLAY. Sand is fine. Gravel is sub-angular fine to coarse of mixed lithologies including sandstone. (GLACIAL TILL)								
	1.50	HSV	76kPa												
	2.00	HSV	80kPa				1.80	21.90		'Soft' greyish brown laminated CLAY with very closely spaced fine sand partings and occasional wood fragments. (GLACIAL TILL) <i>Groundwater encountered as slight seepage at 2.00m bgl.</i>					
	2.50	HSV	72kPa												
	3.00	HSV	74kPa												
	3.40	D													
3.50	HSV	58kPa													
4.00	HSV	50kPa	4.00	19.70	End of Pit at 4.00m										
Remarks: Trial pit complete at 4.00m bgl. Groundwater encountered at 2.00m bgl. Backfilled with arisings upon completion.															
Pit Stability: Pit remained stable during excavation.															



				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP207 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425634E - 584440N Level (m AOD): 23.40		Date 16/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 4.00		Pit Length (m): 2.50 Pit Width (m): 0.66	
Client: Dysart Developments								Scale 1:25 Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
	0.30	CBR	1%	0.30	23.10		Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)		
	0.38	CBR	1%				'Firm' greyish brown CLAY. (GLACIAL TILL)		
	0.45	CBR	2%						
	0.50	HSV	70kPa						
	0.53	CBR	1%						
	0.60	CBR	2%						
	0.68	CBR	2%						
	0.75	CBR	3%						
	0.83	CBR	3%						
	1.00	HSV	76kPa				Groundwater encountered as slight seepage at 2.00m bgl.		
1.50	HSV	90kPa							
	2.00	HSV	60kPa	2.50	20.90		'Soft' greyish brown laminated CLAY with very closely spaced fine sand partings and occasional wood fragments. (GLACIAL TILL)		
	2.60	HSV	60kPa						
	3.00	HSV	50kPa						
	3.50	HSV	48kPa						
	4.00	HSV	48kPa	4.00	19.40		End of Pit at 4.00m		
Remarks: Trial pit complete at 4.00m bgl. Groundwater encountered at 2.00m bgl. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									



Trial Pit Log

Trial Pit No.

TP208

Sheet 1 of 1

Project Name: **Whinney Hill**

Project No.
N16055

Co-ords: 425619E - 584512N
Level (m AOD): 23.30

Date
16/06/2016

Location: Guide Post, Northumberland

Final Depth (m): Pit Length (m): 2.50

Scale
1:25

Client: **Dysart Developments**

4.00 Pit Width (m): 0.66



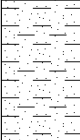
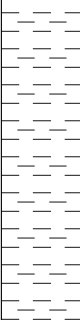
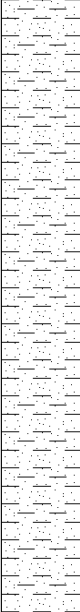
Logged By
TD

Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description	
	Depth (m bgl)	Type	Results					
							Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)	
	0.30	CBR	4%	0.30	23.00			
	0.38	CBR	2%					
	0.40	D						
	0.45	CBR	3%	0.55	22.75		'Firm' light brown mottled slightly sandy CLAY. Sand is fine. (GLACIAL TILL)	
	0.50	HSV	72kPa					
	0.53	CBR	2%					
	0.60	CBR	2%					
	0.68	CBR	2%					
	0.75	CBR	2%					
	0.83	CBR	1%					
	1.00	HSV	72kPa					1
	1.50	HSV	86kPa					
	2.00	HSV	58kPa					2
	2.50	HSV	60kPa	2.20	21.10		'Soft' greyish brown laminated CLAY with very closely spaced fine sand partings and occasional wood fragments. (GLACIAL TILL)	
	3.00	HSV	50kPa					3
	3.50	HSV	40kPa					
	4.00	HSV	42kPa	4.00	19.30		End of Pit at 4.00m	4
								5



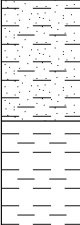
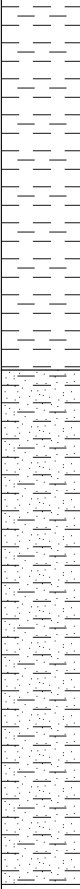



Remarks: Trial pit complete at 4.00m bgl.
No groundwater encountered.
Backfilled with arisings upon completion.

Pit Stability: Pit remained stable during excavation.




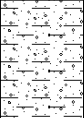
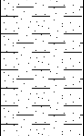
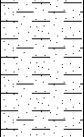


				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP209 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425626E - 584585N Level (m AOD): 24.20		Date 17/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 4.00		Pit Length (m): 2.50 Pit Width (m): 0.66	
Client: Dysart Developments								Scale 1:25 Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
	0.10	ES					Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)		
	0.30	CBR	1%	0.30	23.90		'Firm' greyish brown mottled slightly sandy CLAY. Sand is fine. (GLACIAL TILL)		
	0.38	CBR	1%						
	0.45	CBR	2%						
	0.50	HSV	72kPa						
	0.53	CBR	2%						
	0.60	CBR	2%				'Firm' greyish brown CLAY. (GLACIAL TILL)		
	0.68	CBR	2%	0.80	23.40				
	0.75	CBR	3%						
	0.83	CBR	3%						
	1.00	HSV	82kPa						
	1.50	HSV	80kPa				'Soft' greyish brown laminated CLAY with very closely spaced fine sand partings and occasional wood fragments. (GLACIAL TILL)		
	2.00	HSV	88kPa	1.90	22.30				
	2.50	HSV	70kPa						
	3.00	HSV	48kPa						
	3.50	HSV	32kPa						
	4.00	HSV	40kPa	4.00	20.20		End of Pit at 4.00m		
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									



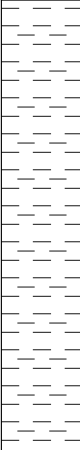
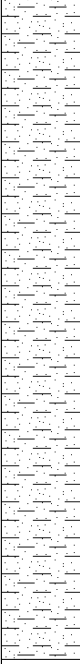



				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP210 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425629E - 584634N Level (m AOD): 24.20		Date 17/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 4.00		Pit Length (m): 2.50 Pit Width (m): 0.66	
Client: Dysart Developments								Scale 1:25 Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
				0.30	23.90		Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)		
	0.30	CBR	1%	0.70	23.50		'Stiff' greyish brown mottled slightly sandy CLAY. Sand is fine. (GLACIAL TILL)		
	0.38	CBR	1%						
	0.45	CBR	2%						
	0.50	HSV	70kPa						
	0.53	CBR	2%						
	0.60	CBR	2%						
	0.68	CBR	2%						
	0.75	CBR	2%						
	0.83	CBR	2%	2.30	21.90		'Firm' greyish brown CLAY. (GLACIAL TILL)		
	1.00	HSV	98kPa						
1.50	HSV	110kPa	2.30	21.90		<i>Becomes laminated from 1.40m bgl.</i> <div style="border: 1px solid black; height: 100px; width: 100%;"></div>			
2.00	HSV	96kPa							
2.50	HSV	28kPa	4.00	20.20		'Soft' greyish brown laminated CLAY with very closely spaced fine sand partings and occasional wood fragments. (GLACIAL TILL) <div style="border: 1px solid black; height: 100px; width: 100%;"></div>			
3.00	HSV	40kPa							
3.50	HSV	42kPa	4.00	20.20		End of Pit at 4.00m			
4.00	HSV	38kPa							
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									







				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP211 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425664E - 584414N Level (m AOD): 22.90		Date 16/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 4.00		Pit Length (m): 2.50 Pit Width (m): 0.66	
Client: Dysart Developments								Scale 1:25 Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
	0.10	ES		0.30	22.60		Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)		
	0.30	CBR	2%						
	0.38	CBR	2%	0.70	22.20		'Firm' grey mottled light brown sandy slightly gravelly CLAY. Sand is fine. Gravel is sub-angular fine to coarse of mixed lithologies including sandstone. (GLACIAL TILL)		
	0.45	CBR	3%						
	0.50	HSV	78kPa						
	0.53	CBR	3%						
	0.60	CBR	2%						
	0.68	CBR	2%						
	0.75	CBR	2%						
	0.83	CBR	2%						
	1.00	HSV	72kPa	1.80	21.10		'Soft' greyish brown laminated CLAY with very closely spaced fine sand partings and occasional wood fragments. (GLACIAL TILL) <i>Groundwater encountered as slight seepage at 2.00m bgl.</i>		
	1.50	HSV	70kPa						
2.00	HSV	70kPa							
	2.50	HSV	50kPa	3.00	40kPa				
	3.50	HSV	30kPa						
	4.00	HSV	38kPa						
				4.00	18.90		End of Pit at 4.00m		
Remarks: Trial pit complete at 4.00m bgl. Groundwater encountered at 2.00m bgl. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									




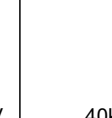
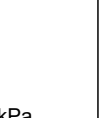



				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP212 Sheet 1 of 1		
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425687E - 584448N Level (m AOD): 23.30		Date 16/06/2016		
Location: Guide Post, Northumberland						Final Depth (m): 4.00		Pit Length (m): 2.50 Pit Width (m): 0.66		
Client: Dysart Developments								Scale 1:25 Logged By TD		
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description			
	Depth (m bgl)	Type	Results							
	0.30	CBR	1%	0.30	23.00		Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)			
	0.38	CBR	1%							
	0.45	CBR	2%							
	0.50	HSV	96kPa							
	0.53	CBR	3%							
	0.60	CBR	2%							
	0.68	CBR	2%							
	0.75	CBR	2%							
	0.83	CBR	2%							
	1.00	HSV	78kPa				'Firm' greyish brown CLAY. (GLACIAL TILL)			
	1.50	HSV	72kPa							
	2.00	HSV	80kPa	1.80	21.50			'Soft' greyish brown laminated CLAY with very closely spaced fine sand partings and occasional wood fragments. (GLACIAL TILL)		
	2.50	HSV	68kPa							
	3.00	HSV	38kPa							
	3.50	HSV	40kPa							
	4.00	HSV	42kPa	4.00	19.30			End of Pit at 4.00m		
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.										
Pit Stability: Pit remained stable during excavation.										





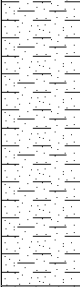
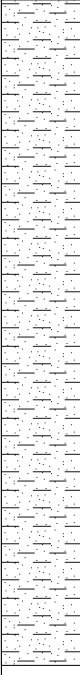
				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP213 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425679E - 584525N Level (m AOD): 23.80		Date 16/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 4.00		Pit Length (m): 2.50 Pit Width (m): 0.66	
Client: Dysart Developments								Scale 1:25 Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
	0.10	ES					Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)		
	0.30	CBR	4%	0.30	23.50		'Firm' light brown mottled slightly sandy CLAY. Sand is fine. (GLACIAL TILL)		
	0.38	CBR	4%						
	0.45	CBR	4%						
	0.50	HSV	80kPa						
	0.53	CBR	4%	0.60	23.20		'Firm' greyish brown CLAY. (GLACIAL TILL)		
	0.60	CBR	3%						
	0.68	CBR	2%						
	0.75	CBR	3%						
	0.83	CBR	2%						
	1.00	D							
	1.00	HSV	58kPa						
	1.50	HSV	60kPa						
	2.00	HSV	66kPa						
	2.50	HSV	70kPa						
	3.00	HSV	72kPa						
	3.50	HSV	80kPa						
	4.00	HSV	74kPa	4.00	19.80		End of Pit at 4.00m		
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									



				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP214 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425668E - 584591N Level (m AOD): 23.70		Date 17/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 4.00		Pit Length (m): 2.50 Pit Width (m): 0.66	
Client: Dysart Developments								Scale 1:25 Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
							Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)		
	0.30	CBR	1%	0.30	23.40		'Loose' light brown clayey fine SAND. (GLACIAL SAND)		
	0.38	CBR	2%						
	0.45	CBR	3%						
	0.53	CBR	3%						
	0.60	CBR	2%						
	0.68	CBR	2%						
	0.75	CBR	2%	0.80	22.90		'Firm' greyish brown CLAY. (GLACIAL TILL)		
	0.83	CBR	3%						
	1.00	HSV	88kPa						
1.50	HSV	88kPa							
2.00	HSV	42kPa				'Soft' greyish brown laminated CLAY with very closely spaced fine sand partings and occasional wood fragments. (GLACIAL TILL) <i>Groundwater encountered as slight seepage at 2.20m bgl.</i>			
2.50	HSV	40kPa	2.20	21.50					
3.00	HSV	44kPa							
3.50	HSV	42kPa							
4.00	HSV	50kPa	4.00	19.70	End of Pit at 4.00m				
Remarks: Trial pit complete at 4.00m bgl. Groundwater encountered at 2.20m bgl. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									




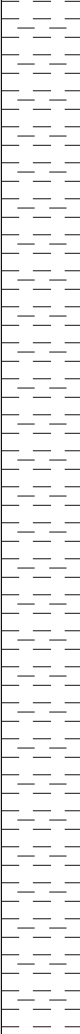











				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP216 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425737E - 584418N Level (m AOD): 22.60		Date 16/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 4.00		Pit Length (m): 2.50 Pit Width (m): 0.66	
Client: Dysart Developments								Scale 1:25 Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
	0.10	ES		0.15	22.45		Grass over dark brown gravelly SAND. Gravel is angular to sub-angular fine to coarse of mixed lithologies including brick. (TOPSOIL)		
	0.40	ES					'Loose' dark brown sandy angular fine to coarse GRAVEL AND COBBLES of brick and concrete with numerous fragments of plastic and metal. (MADE GROUND)		
	1.00	HSV	80kPa	0.85	21.75		'Firm' grey mottled light brown slightly sandy CLAY. Sand is fine. (GLACIAL TILL)		
	1.50	HSV	44kPa						
	2.00	HSV	40kPa	1.80	20.80		'Soft' greyish brown CLAY with very closely spaced fine sand partings and occasional wood fragments. (GLACIAL TILL)		
	2.50	HSV	30kPa						
	3.00	HSV	38kPa						
	3.50	HSV	42kPa						
	4.00	HSV	40kPa	4.00	18.60		End of Pit at 4.00m		
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									













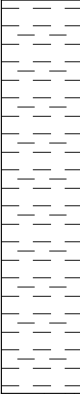
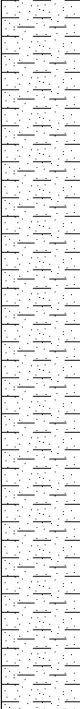
				<h1>Trial Pit Log</h1>				Trial Pit No. TP218 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425724E - 584531N		Date 16/06/2016	
						Level (m AOD): 23.40			
Location: Guide Post, Northumberland						Final Depth (m):	Pit Length (m): 2.50	Scale 1:25	
Client: Dysart Developments						4.00	Pit Width (m): 0.66	Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
							Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)		
	0.30	CBR	3%	0.30	23.10		'Loose' light brown clayey fine SAND. (GLACIAL SAND)		
	0.38	CBR	2%	0.55	22.85		'Firm' greyish brown CLAY. (GLACIAL TILL)		
	0.45	CBR	2%						
	0.53	CBR	2%						
	0.60	CBR	3%						
	0.68	CBR	4%						
	0.75	CBR	2%						
	0.83	CBR	3%						
	1.00	HSV	86kPa						1
	1.50	HSV	82kPa						
	2.00	HSV	62kPa						2
	2.50	HSV	70kPa						
	3.00	HSV	80kPa						3
	3.50	HSV	74kPa						
4.00	HSV	72kPa	4.00	19.40		End of Pit at 4.00m			4
									5
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									


				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP220 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425709E - 584645N Level (m AOD): 23.30		Date 17/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 4.00		Pit Length (m): 2.50 Pit Width (m): 0.66	
Client: Dysart Developments								Scale 1:25 Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
	0.10	ES		0.30	23.00		Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)		
	0.30	CBR	1%				'Loose' light brown clayey fine SAND. (GLACIAL SAND)		
	0.38	CBR	2%						
	0.40	B		0.60	22.70		'Firm' greyish brown CLAY. (GLACIAL TILL)		
	0.45	CBR	2%						
	0.53	CBR	2%						
	0.60	CBR	2%						
	0.68	CBR	2%						
	0.75	CBR	2%						
	0.75	HSV	84kPa						
	0.83	CBR	2%	2.40	20.90		Sub-rounded boulder encountered at 2.20m bgl.		
	1.00	HSV	88kPa						
	1.50	HSV	88kPa						
	2.00	HSV	54kPa	3.00	20.90		'Soft' greyish brown laminated CLAY with very closely spaced fine sand partings and occasional wood fragments. (GLACIAL TILL)		
	2.50	HSV	50kPa						
3.00	HSV	34kPa							
3.50	HSV	30kPa	4.00	19.30		End of Pit at 4.00m			
4.00	HSV	42kPa							
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									






				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP221 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425751E - 584651N Level (m AOD): 23.60		Date 16/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 4.00		Pit Length (m): 2.50 Pit Width (m): 0.66	
Client: Dysart Developments								Scale 1:25 Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
				0.30	23.30		Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)		
	0.30	CBR	1%	0.65	22.95		'Loose' light brown clayey fine SAND. (GLACIAL SAND)		
	0.38	CBR	2%						
	0.45	CBR	2%						
	0.53	CBR	2%						
	0.60	CBR	2%						
	0.68	CBR	2%						
	0.75	CBR	4%						
	0.75	HSV	80kPa	2.00	21.60		'Firm' greyish brown CLAY. (GLACIAL TILL)		
	0.83	CBR	3%						
	1.00	HSV	70kPa						
	1.50	HSV	72kPa						
	2.25	HSV	50kPa						
	2.50	HSV	50kPa						
	3.00	HSV	38kPa						
3.50	HSV	50kPa	4.00	19.60		End of Pit at 4.00m			
4.00	HSV	50kPa							
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									



				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP222 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425779E - 584478N Level (m AOD): 23.70		Date 16/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 4.00		Pit Length (m): 2.50 Pit Width (m): 0.66	
Client: Dysart Developments								Scale 1:25 Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
	0.10	ES		0.30	23.40		Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)		
	0.30	CBR	2%						
	0.38	CBR	2%						
	0.45	CBR	3%						
	0.50	HSV	78kPa						
	0.53	CBR	2%						
	0.60	CBR	1%						
	0.68	CBR	1%						
	0.75	CBR	1%						
	0.83	CBR	1%						
	1.00	HSV	100kPa	1.60	22.10		'Stiff' greyish brown CLAY. (GLACIAL TILL)		
	1.50	HSV	92kPa						
	1.75	D							
	2.00	HSV	60kPa						
	2.50	HSV	62kPa						
3.00	HSV	58kPa	3.50	42kPa		'Firm' greyish brown laminated CLAY with very closely spaced fine sand partings and occasional wood fragments. (GLACIAL TILL)			
3.50	HSV	42kPa							
4.00	HSV	40kPa							
4.00	HSV	40kPa	4.00	19.70		End of Pit at 4.00m			
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									






				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP223 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425773E - 584539N Level (m AOD): 23.00		Date 16/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 4.00		Pit Length (m): 2.50 Pit Width (m): 0.66	
Client: Dysart Developments								Scale 1:25 Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
	0.25	CBR	2%	0.25	22.75		Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL) 'Loose' light brown clayey fine SAND. (GLACIAL SAND)		
	0.33	CBR	3%						
	0.40	CBR	2%				'Firm' greyish brown CLAY. (GLACIAL TILL)		
	0.48	CBR	2%						
	0.55	CBR	3%	0.55	22.45				
	0.63	CBR	4%						
	0.70	CBR	7%						
	0.75	HSV	96kPa						
	0.78	CBR	8%						
	1.00	HSV	100kPa						
	1.50	HSV	92kPa				End of Pit at 4.00m		
	2.00	HSV	60kPa						
	2.50	HSV	62kPa						
	3.00	HSV	70kPa						
	3.50	HSV	62kPa						
	4.00	HSV	60kPa	4.00	19.00				
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									



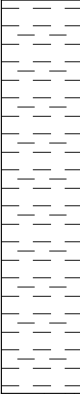
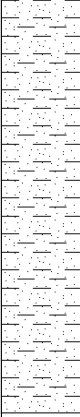








				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP226 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425947E - 584455N Level (m AOD): 19.70		Date 17/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 4.00		Pit Length (m): 2.50 Pit Width (m): 0.66	
Client: Dysart Developments								Scale 1:25 Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
	0.10	ES		0.30	19.40		Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)		
	0.30	CBR	2%				'Stiff' greyish brown slightly gravelly widely fissured CLAY. Gravel is sub-angular medium to coarse of mixed lithologies including sandstone. (GLACIAL TILL)		
	0.38	CBR	3%						
	0.45	CBR	4%						
	0.50	HSV	80kPa						
	0.53	CBR	3%						
	0.60	CBR	2%						
	0.60	D							
	0.68	CBR	3%						
	0.75	CBR	3%						
	0.83	CBR	3%						
	1.00	HSV	80kPa						
	1.50	HSV	84kPa	1.70	18.00		'Firm' greyish brown laminated CLAY with very closely spaced fine sand partings and occasional wood fragments. (GLACIAL TILL)		
	2.00	HSV	70kPa						
	2.50	HSV	70kPa						
3.00	HSV	72kPa							
3.50	HSV	70kPa							
4.00	HSV	70kPa	4.00	15.70		End of Pit at 4.00m			
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									



				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP228 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425748E - 584509N Level (m AOD): 23.20		Date 24/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 3.00		Pit Length (m): 2.50 Pit Width (m): 0.66	
Client: Dysart Developments								Scale 1:25 Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
	0.30	CBR	1%	0.30	22.90		Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)		
	0.38	CBR	2%						
	0.45	CBR	1%						
	0.50	HSV	80kPa						
	0.53	CBR	2%						
	0.60	CBR	2%						
	0.68	CBR	3%						
	0.75	CBR	3%						
	0.83	CBR	3%						
	1.00	HSV	80kPa				'Stiff' greyish brown CLAY. (GLACIAL TILL)		
	1.50	HSV	84kPa						
	2.00	HSV	70kPa						
	2.50	HSV	80kPa						
	3.00	HSV	74kPa						
				1.60	21.60		'Stiff' greyish brown laminated CLAY with very closely spaced fine sand partings and occasional wood fragments. (GLACIAL TILL)		
				3.00	20.20		End of Pit at 3.00m		
Remarks: Trial pit complete at 3.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									



Trial Pit Log

Trial Pit No.

TP302

Sheet 1 of 1

Project Name: **Whinney Hill**

Project No.
N16055

Co-ords: 425354E - 584758N
Level (m AOD): 34.50

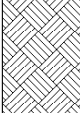
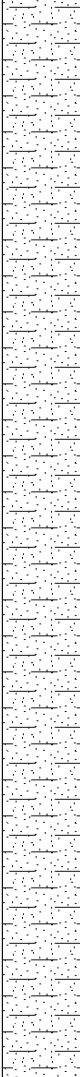
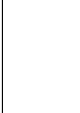
Date
23/06/2016


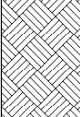


Location: Guide Post, Northumberland

Final Depth (m):
4.00
Pit Length (m): 2.50
Pit Width (m): 0.66


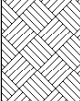


Scale
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Logged By
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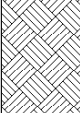
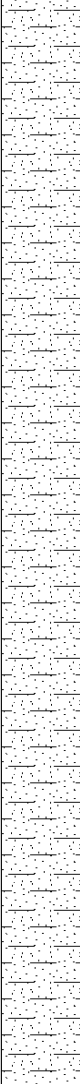

Client: **Dysart Developments**




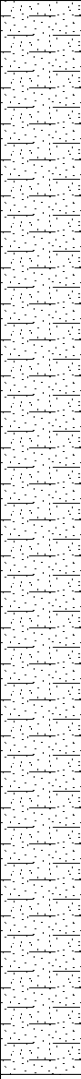
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
				0.40	34.10		Grass over dark brown slightly clayey fine to medium organic SAND. (TOPSOIL)	1	
	0.40	CBR	1%				'Loose' brown fine to medium SAND with widely spaced pockets of sandy laminated CLAY. (GLACIAL SAND)		2
	0.48	CBR	1%						
	0.55	CBR	2%						
	0.63	CBR	1%						
	0.70	CBR	1%						
	0.78	CBR	2%						
	0.85	CBR	1%						
	0.93	CBR	1%						
				4.00	30.50		End of Pit at 4.00m	3	
							4		
							5		


				<h1>Trial Pit Log</h1>				Trial Pit No. TP303 Sheet 1 of 1		
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425407E - 584717N		Date 23/06/2016		
						Level (m AOD): 34.20				
Location: Guide Post, Northumberland						Final Depth (m): 3.00	Pit Length (m): 2.50		Scale 1:25	
Client: Dysart Developments							Pit Width (m): 0.66		Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description			
	Depth (m bgl)	Type	Results							
	0.10	ES		0.40	33.80		Grass over dark brown slightly clayey fine to medium organic SAND. (TOPSOIL)			
	0.40	CBR	1%				'Loose' brown fine to medium SAND with widely spaced pockets of sandy laminated CLAY. (GLACIAL SAND)			
	0.48	CBR	2%							
	0.55	CBR	3%							
	0.63	CBR	3%							
	0.70	CBR	3%							
	0.78	CBR	3%							
	0.85	CBR	2%							
	0.93	CBR	3%							
				3.00	31.20		End of Pit at 3.00m			
Remarks: Trial pit complete at 2.50m bgl. No groundwater encountered. Backfilled with arisings upon completion.										
Pit Stability: Pit remained stable during excavation.										


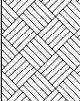
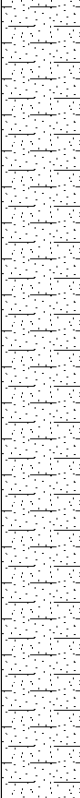

				<h1>Trial Pit Log</h1>			Trial Pit No. TP304 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425423E - 584755N		Date 23/06/2016
						Level (m AOD): 33.60		
Location: Guide Post, Northumberland						Final Depth (m): 4.00	Pit Length (m): 2.50	Scale 1:25
Client: Dysart Developments							Pit Width (m): 0.66	Logged By TD
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description	
	Depth (m bgl)	Type	Results					
	0.40	CBR	1%	0.40	33.20		Grass over dark brown slightly clayey fine to medium organic SAND. (TOPSOIL)	
	0.48	CBR	3%				 'Loose' brown fine to medium SAND with widely spaced pockets of sandy laminated CLAY. (GLACIAL SAND)	
	0.55	CBR	4%					
	0.63	CBR	6%					
	0.70	CBR	7%					
	0.78	CBR	7%					
	0.85	CBR	10%					
	0.93	CBR	12%					
				4.00	29.60		End of Pit at 4.00m	
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.								
Pit Stability: Pit remained stable during excavation.								

				<h1>Trial Pit Log</h1>			Trial Pit No. TP305 Sheet 1 of 1				
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425436E - 584686N		Date 23/06/2016			
						Level (m AOD): 33.10					
Location: Guide Post, Northumberland						Final Depth (m): 4.00	Pit Length (m): 2.50		Scale 1:25		
Client: Dysart Developments							Pit Width (m): 0.66		Logged By TD		
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description				
	Depth (m bgl)	Type	Results								
<div>▼</div>	0.35	CBR	1%	0.35	32.75		Grass over dark brown slightly clayey fine to medium organic SAND. (TOPSOIL)				
	0.43	CBR	1%				'Loose' brown fine to medium SAND with widely spaced pockets of sandy laminated CLAY. (GLACIAL SAND)				
	0.50	CBR	2%								
	0.58	CBR	4%								
	0.65	CBR	7%								
	0.73	CBR	7%								
	0.80	CBR	5%								
	0.88	CBR	10%								
							<p>Groundwater encountered as slight seepage at 2.00m bgl. Becomes very clayey from 2.00m bgl. 'Pit collapsed from 2.00m bgl during excavation.'</p>				
				4.00	29.10		End of Pit at 4.00m				
Remarks: Trial pit complete at 4.00m bgl. Groundwater encountered at 2.00m bgl. Backfilled with arisings upon completion.											
Pit Stability: Pit remained stable during excavation.											


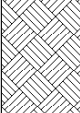
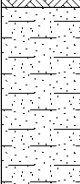
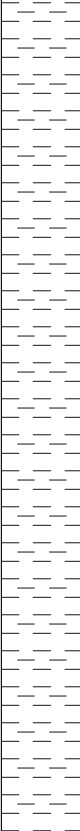

				<h1>Trial Pit Log</h1>				Trial Pit No. TP401 Sheet 1 of 1		
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425479E - 584696N		Date 23/06/2016		
						Level (m AOD): 32.50				
Location: Guide Post, Northumberland						Final Depth (m): 4.00	Pit Length (m): 2.50		Scale 1:25	
Client: Dysart Developments							Pit Width (m): 0.66		Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description			
	Depth (m bgl)	Type	Results							
<div>▼</div>				0.40	32.10		Grass over dark brown slightly clayey fine to medium organic SAND. (TOPSOIL)			<div>1</div> <div>2</div> <div>3</div> <div>4</div> <div>5</div>
	0.40	CBR	1%				'Loose' orange brown fine to medium SAND with widely spaced pockets of laminated CLAY. (GLACIAL SAND)			
	0.48	CBR	1%							
	0.55	CBR	2%							
	0.60	D								
	0.63	CBR	2%							
	0.70	CBR	3%							
	0.78	CBR	2%							
	0.85	CBR	4%							
	0.93	CBR	4%							
				4.00	28.50	<i>Becomes clayey from 1.80m bgl.</i>				
						<i>Groundwater encountered as slight seepage at 2.00m bgl.</i>				
						<i>Pit collapsed from 2.70m bgl during excavation.</i>				
					End of Pit at 4.00m					
Remarks: Trial pit complete at 4.00m bgl. Groundwater encountered at 2.00m bgl. Backfilled with arisings upon completion.										
Pit Stability: Pit collapsed from 2.70m bgl during excavation.										




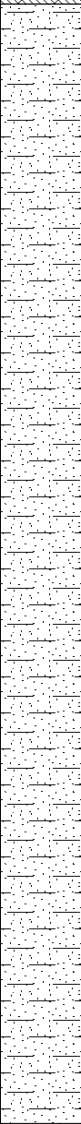



				<h1>Trial Pit Log</h1>				Trial Pit No. TP402 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425473E - 584762N		Date 23/06/2016	
						Level (m AOD): 31.10			
Location: Guide Post, Northumberland						Final Depth (m):	Pit Length (m): 2.50	Scale 1:25	
Client: Dysart Developments						4.00	Pit Width (m): 0.66	Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
	0.45	CBR	2%	0.45	30.65		Grass over dark brown slightly clayey fine to medium organic SAND. (TOPSOIL)		
	0.53	CBR	3%						
	0.60	CBR	7%						
	0.68	CBR	9%						
	0.75	CBR	10%						
	0.83	CBR	FAIL						
	2.00	HSV	20kPa	4.00	27.10	<p>Groundwater encountered as slight seepage at 1.80m bgl. Pit collapsed from 2.00m bgl during excavation. Band of 'soft' grey sandy CLAY encountered between 1.80m and 2.20m bgl.</p>			
						<p>End of Pit at 4.00m</p>			
Remarks: Trial pit complete at 4.00m bgl. Groundwater encountered at 1.80m bgl. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									








				<h1>Trial Pit Log</h1>			Trial Pit No. TP403 Sheet 1 of 1		
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425529E - 584715N		Date 23/06/2016	
						Level (m AOD): 29.40			
Location: Guide Post, Northumberland				Final Depth (m): 3.00		Pit Length (m): 2.50		Scale 1:25	
Client: Dysart Developments						Pit Width (m): 0.66		Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
	0.10	ES		0.35	29.05		Grass over dark brown slightly clayey fine to medium organic SAND. (TOPSOIL)		
	0.35	CBR	2%				'Loose' light orange brown fine to medium SAND with closely spaced pockets of laminated CLAY. (GLACIAL SAND)		
	0.43	CBR	3%						
	0.50	CBR	5%						
	0.58	CBR	7%						
	0.65	CBR	2%						
	0.73	CBR	1%						
	0.80	CBR	2%						
	0.88	CBR	2%						
				3.00	26.40		End of Pit at 3.00m		
Remarks: Trial pit complete at 3.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									



				<h1>Trial Pit Log</h1>				Trial Pit No. TP405 Sheet 1 of 1		
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425595E - 584672N		Date 23/06/2016		
						Level (m AOD): 25.50				
Location: Guide Post, Northumberland						Final Depth (m):	Pit Length (m): 2.50	Scale 1:25		
Client: Dysart Developments						4.00	Pit Width (m): 0.66	Logged By TD		
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description			
	Depth (m bgl)	Type	Results							
							Grass over dark brown slightly clayey fine to medium organic SAND. (TOPSOIL)			1
	0.40	CBR	1%	0.40	25.10		'Loose' light orange brown clayey fine to medium SAND. (GLACIAL SAND)			
	0.48	CBR	2%							
	0.55	CBR	5%							
	0.63	CBR	6%							
	0.70	CBR	8%							
	0.78	CBR	6%							
	0.85	CBR	8%							
	0.93	CBR	9%							
	1.25	HSV	54kPa	1.20	24.30		'Firm' greyish brown CLAY. (GLACIAL TILL)			2
	1.50	HSV	50kPa							
	2.00	HSV	54kPa							
	2.50	HSV	58kPa							
	3.00	HSV	52kPa							
	3.50	HSV	60kPa							
4.00	HSV	58kPa								
			4.00	21.50		End of Pit at 4.00m			4	
										5
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.										
Pit Stability: Pit remained stable during excavation.										

				<h1>Trial Pit Log</h1>				Trial Pit No. TP406 Sheet 1 of 1				
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425537E - 584653N		Date 23/06/2016				
						Level (m AOD): 29.50						
Location: Guide Post, Northumberland						Final Depth (m): 4.00	Pit Length (m): 2.50		Scale 1:25			
Client: Dysart Developments							Pit Width (m): 0.66		Logged By TD			
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description					
	Depth (m bgl)	Type	Results									
	0.30	CBR	2%	0.30	29.20		Grass over dark brown slightly clayey fine to medium organic SAND. (TOPSOIL)				1	
	0.38	CBR	4%				'Loose' light orange brown clayey fine to medium SAND. (GLACIAL SAND)					
	0.45	CBR	7%									
	0.53	CBR	8%									
	0.60	CBR	8%									
	0.68	CBR	8%									
	0.75	CBR	4%									
	0.83	CBR	4%									
					4.00	25.50		Groundwater encountered as slight seepage at 1.70m bgl.				2
								Becomes very clayey from 2.00m bgl. 'Pit collapsed from 2.00m bgl during excavation.				
				4.00	25.50		End of Pit at 4.00m				4	
				4.00	25.50						5	
Remarks: Trial pit complete at 4.00m bgl. Groundwater encountered at 1.70m bgl. Backfilled with arisings upon completion.												
Pit Stability: Pit remained stable during excavation.												

				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP501 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425638E - 584708N Level (m AOD): 24.60		Date 24/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 3.00		Pit Length (m): 2.50 Pit Width (m): 0.66	
Client: Dysart Developments								Scale 1:25 Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
	0.30	CBR	2%	0.30	24.30		Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)		
	0.38	CBR	3%				 'Loose' orange brown fine to coarse SAND. (GLACIAL SAND)		
	0.45	CBR	3%						
	0.53	CBR	2%						
	0.60	CBR	2%						
	0.68	CBR	3%	0.60	24.00		'Stiff' greyish brown slightly sandy CLAY. Sand is fine. (GLACIAL TILL)		
	0.75	CBR	4%						
	0.83	CBR	4%						
	1.00	HSV	92kPa						
	1.50	HSV	86kPa						
	2.00	HSV	100kPa						
	2.50	HSV	80kPa						
	3.00	HSV	80kPa	3.00	21.60		End of Pit at 3.00m		
Remarks: Trial pit complete at 3.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									







Trial Pit Log

Trial Pit No.

TP504

Sheet 1 of 1

Project Name: **Whinney Hill**

Project No.
N16055

Co-ords: 425605E - 584669N
Level (m AOD): 24.70

Date
20/06/2016

Location: Guide Post, Northumberland




Final Depth (m): Pit Length (m): 2.50

Scale
1:25

Client: **Dysart Developments**

4.00 Pit Width (m): 0.66

Logged By
TD

Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description	
	Depth (m bgl)	Type	Results					
	0.10	ES		0.30	24.40		Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)	
	0.30	CBR	4%				'Loose' orange brown clayey fine to coarse SAND. (GLACIAL SAND)	
	0.38	CBR	4%					
	0.45	CBR	4%					
	0.53	CBR	2%					
	0.60	CBR	1%					
	0.60	D						
	0.68	CBR	2%					
	0.75	CBR	2%					
	0.83	CBR	2%					
	1.80	D		1.70	23.00		'Firm' brown slightly sandy laminated CLAY. (GLACIAL TILL)	
	2.00	HSV	62kPa					
	2.50	HSV	42kPa					
	3.25	HSV	50kPa	3.00	21.70		'Firm' grey laminated CLAY with very closely spaced fine sand partings and occasional wood fragments. (GLACIAL TILL)	
	3.50	HSV	56kPa					
	4.00	HSV	50kPa					
				4.00	20.70		End of Pit at 4.00m	

Remarks: Trial pit complete at 4.00m bgl.
No groundwater encountered.
Backfilled with arisings upon completion.

Pit Stability: Pit remained stable during excavation.



Trial Pit Log

Trial Pit No.

TP505

Sheet 1 of 1

Project Name: **Whinney Hill**

Project No.
N16055

Co-ords: 425691E - 584723N
Level (m AOD): 24.30


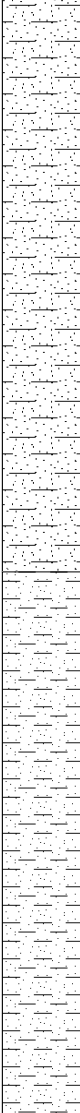
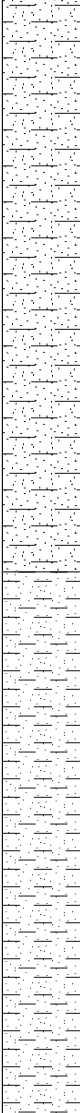
Date
20/06/2016

Location: Guide Post, Northumberland

Final Depth (m):
4.00
Pit Length (m): 2.50
Pit Width (m): 0.66

Scale
1:25
Logged By
TD


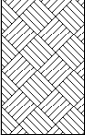
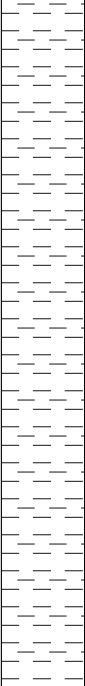
Client: **Dysart Developments**

Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description	
	Depth (m bgl)	Type	Results					
	0.10	ES		0.30	24.00		Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)	1
	0.30	CBR	1%					
	0.38	CBR	2%					
	0.45	CBR	2%					
	0.53	CBR	3%					
	0.60	CBR	4%					
	0.68	CBR	4%					
	0.75	CBR	3%					
	0.83	CBR	3%					
				2.20	22.10		'Loose' orange brown fine to coarse SAND. (GLACIAL SAND)	2
2.50	HSV	52kPa				'Firm' greyish brown sandy CLAY. Sand is fine. (GLACIAL TILL)	3	
3.00	HSV	44kPa						
3.50	HSV	48kPa						
4.00	HSV	50kPa	4.00	20.30		End of Pit at 4.00m	4	
								5



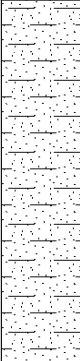
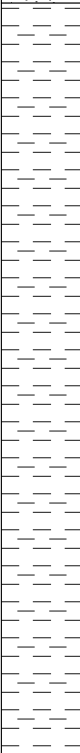

Remarks: Trial pit complete at 4.00m bgl.
No groundwater encountered.
Backfilled with arisings upon completion.

Pit Stability: Pit remained stable during excavation.





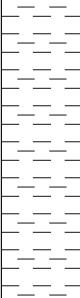


				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP506 Sheet 1 of 1				
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425655E - 584762N Level (m AOD): 25.60		Date 20/06/2016				
Location: Guide Post, Northumberland						Final Depth (m):		Pit Length (m): 2.50 Scale 1:25				
Client: Dysart Developments						4.00		Pit Width (m): 0.66 Logged By TD				
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description					
	Depth (m bgl)	Type	Results									
	0.10	ES		0.45	25.15		Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)					
	0.45	CBR	4%									
	0.53	CBR	2%									
	0.60	CBR	2%									
	0.68	CBR	2%									
	0.75	CBR	2%									
	0.83	CBR	4%									
	0.90	CBR	4%									
	0.98	CBR	4%				<div style="position: relative; height: 600px;"> <div style="position: absolute; top: 0; right: 0; width: 20px; text-align: center;">1</div> <div style="position: absolute; bottom: 0; right: 0; width: 20px; text-align: center;">2</div> <div style="position: absolute; bottom: 100px; right: 0; width: 20px; text-align: center;">3</div> <div style="position: absolute; bottom: 200px; right: 0; width: 20px; text-align: center;">4</div> <div style="position: absolute; bottom: 300px; right: 0; width: 20px; text-align: center;">5</div> </div>					
	1.75	D		1.70	23.90					'Firm' dark greyish brown CLAY. (GLACIAL TILL) <i>Becomes laminated from 3.30m bgl.</i>		
	2.00	HSV	42kPa									
	2.50	HSV	52kPa									
	3.00	HSV	48kPa									
	3.50	HSV	50kPa									
	4.00	HSV	62kPa	4.00	21.60					End of Pit at 4.00m		
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.												
Pit Stability: Pit remained stable during excavation.												


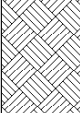
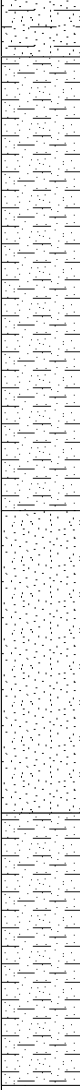


				<h1>Trial Pit Log</h1>				Trial Pit No. TP507 Sheet 1 of 1			
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425755E - 584695N		Date 20/06/2016			
						Level (m AOD): 23.80					
Location: Guide Post, Northumberland						Final Depth (m): 4.00	Pit Length (m): 2.50		Scale 1:25		
Client: Dysart Developments							Pit Width (m): 0.66		Logged By TD		
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description				
	Depth (m bgl)	Type	Results								
	0.10	ES		0.30	23.50		Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)				<div></div>
	0.30	CBR	1%				'Loose' light brown clayey fine to medium SAND. (GLACIAL SAND)				
	0.38	CBR	2%								
	0.45	CBR	2%								
	0.53	CBR	2%								
	0.60	CBR	2%								
	0.68	CBR	2%								
	0.75	CBR	2%								
	0.83	CBR	2%								
				1.50	22.30		'Firm' dark greyish brown CLAY. (GLACIAL TILL)				
	2.00	HSV	60kPa								
	2.50	HSV	54kPa								
	3.00	HSV	56kPa								
	3.50	HSV	54kPa								
	4.00	HSV	56kPa								
4.00	HSV	56kPa									
			4.00	19.80		End of Pit at 4.00m					
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.											
Pit Stability: Pit remained stable during excavation.											


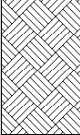
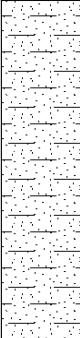
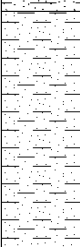
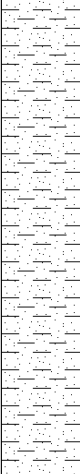




				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP510 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425724E - 584773N Level (m AOD): 25.40		Date 20/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 4.00		Pit Length (m): 2.50 Pit Width (m): 0.66	
Client: Dysart Developments								Scale 1:25 Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
	0.10	ES		0.30	25.10		Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)		
	0.30	CBR	1%						
	0.38	CBR	1%						
	0.45	CBR	1%						
	0.53	CBR	2%						
	0.60	CBR	2%						
	0.68	CBR	1%						
	0.75	CBR	1%						
	0.83	CBR	2%	3.00	22.40		'Firm' dark greyish brown laminated CLAY. (GLACIAL TILL)		
	3.25	HSV	72kPa						
3.75	HSV	62kPa	4.00	21.40		End of Pit at 4.00m			
							<div style="text-align: right;">1</div> <div style="text-align: right;">2</div> <div style="text-align: right;">3</div> <div style="text-align: right;">4</div> <div style="text-align: right;">5</div>		
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									


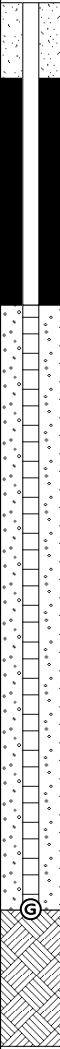

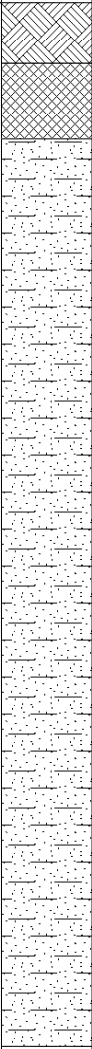


				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP511 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425706E - 584825N Level (m AOD): 26.00		Date 20/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 4.00		Pit Length (m): 2.50 Pit Width (m): 0.66	
Client: Dysart Developments								Scale 1:25 Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
							Crop over dark brown clayey organic fine to medium SAND with occasional fragments of ceramic. (TOPSOIL)		
	0.40	CBR	1%	0.40	25.60		'Loose' light greyish brown clayey fine SAND. (GLACIAL SAND)		
	0.48	CBR	1%	0.60	25.40		'Stiff' dark greyish brown slightly sandy CLAY. Sand is fine. (GLACIAL TILL)		
	0.55	CBR	1%						
	0.63	CBR	1%						
	0.70	CBR	2%						
	0.78	CBR	2%						
	0.85	CBR	3%						
	0.93	CBR	2%						
	1.00	HSV	96kPa						
1.50	HSV	82kPa							
2.00	HSV	92kPa	2.10	23.90		'Loose' greyish brown fine to coarse wet SAND. (GLACIAL SAND)			
			3.10	22.90		'Firm' grey slightly sandy CLAY. Sand is fine. (GLACIAL TILL)			
3.50	HSV	48kPa							
4.00	HSV	52kPa	4.00	22.00		End of Pit at 4.00m			
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									



				<h1 style="text-align: center;">Trial Pit Log</h1>				Trial Pit No. TP512 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425743E - 584862N Level (m AOD): 25.10		Date 20/06/2016	
Location: Guide Post, Northumberland						Final Depth (m): 4.00		Pit Length (m): 2.50 Pit Width (m): 0.66	
Client: Dysart Developments								Scale 1:25 Logged By TD	
Water Strike	Samples & In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
	Depth (m bgl)	Type	Results						
	0.10	ES					Crop over dark brown clayey organic fine to medium SAND with occasional fragments of ceramic. (TOPSOIL)		
	0.45	CBR	1%	0.45	24.65		'Loose' light greyish brown clayey fine SAND. (GLACIAL SAND)		
	0.53	CBR	1%						
	0.60	CBR	1%						
	0.60	D							
	0.68	CBR	2%						
	0.75	CBR	2%						
	0.83	CBR	2%						
	0.90	CBR	2%						
	0.98	CBR	2%						
	1.70	D		1.60	23.50		'Firm' dark greyish brown slightly sandy CLAY. Sand is fine. (GLACIAL TILL)		
	1.75	HSV	70kPa						
	2.50	HSV	52kPa						
	3.00	HSV	58kPa						
	3.50	HSV	54kPa						
	4.00	HSV	50kPa	4.00	21.10				
Remarks: Trial pit complete at 4.00m bgl. No groundwater encountered. Backfilled with arisings upon completion.									
Pit Stability: Pit remained stable during excavation.									





				<h1>Borehole Log</h1>				Borehole No. WS101 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425399E - 584598N		Hole Type BH	
Location: Guide Post, Northumberland						Level (m AOD): 31.80		Scale 1:25	
Client: Dysart Developments						Dates: 13/06/2016		Logged By TD	
Well	Water Strikes	Sample and In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description	
		Depth (m bgl)	Type	Results					
					0.20	31.60		Grass over dark brown friable slightly sandy organic CLAY with numerous rootlets. (TOPSOIL)	
					0.45	31.35		Dark brown friable slightly sandy gravelly organic CLAY. Sand is fine to coarse. Gravel is angular to sub-angular fine to coarse of mixed lithologies including brick. (MADE GROUND)	
		1.00	SPT	N=2 (1,0/1,0,1,0)				Soft grey slightly sandy CLAY. Sand is fine. (GLACIAL SAND)	
		2.00	SPT	N=4 (1,3/1,1,1,1)				Groundwater encountered at 1.90m bgl.	
		3.00	SPT	N=5 (1,1/1,2,1,1)					
					3.45	28.35		End of Borehole at 3.45m	
Remarks: Borehole complete at 3.45m bgl. Groundwater encountered at 1.90m bgl. Monitoring well installed upon completion.									

Borehole Log

Borehole No.

WS102

Sheet 1 of 1

Project Name: **Whinney Hill**

Project No. **N16055**

Co-ords: **425439E - 584435N**

Hole Type **BH**

Location: **Guide Post, Northumberland**

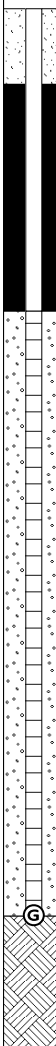

Level (m AOD): **27.30**

Scale **1:25**




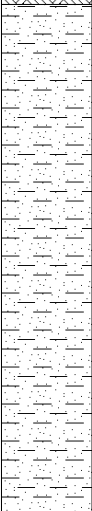
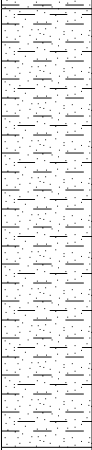

Client: **Dysart Developments**

Dates: **13/06/2016**

Logged By **TD**

Well	Water Strikes	Sample and In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description	
		Depth (m bgl)	Type	Results					
		1.00	SPT	N=13 (2,2/3,3,3,4)	0.25	27.05		Grass over dark brown friable slightly sandy organic CLAY with numerous rootlets. (TOPSOIL)	1
					2.00	SPT	N=4 (1,1/1,1,1,1)	1.50	
		2.10	25.20	'Loose' greyish brown clayey fine SAND. (GLACIAL SAND)					
		3.00	SPT	N=4 (1,0/1,1,1,1)				3.45	23.85
									End of Borehole at 3.45m
									4
									5

Remarks: Borehole complete at 3.45m bgl.
No groundwater encountered.
Monitoring well installed upon completion.

				<h1 style="text-align: center;">Borehole Log</h1>				Borehole No. WS103 Sheet 1 of 1		
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425495E - 584529N		Hole Type BH		
Location: Guide Post, Northumberland						Level (m AOD): 25.60		Scale 1:25		
Client: Dysart Developments						Dates: 13/06/2016		Logged By TD		
Well	Water Strikes	Sample and In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
		Depth (m bgl)	Type	Results						
					0.30	25.30		Grass over dark brown friable slightly sandy organic CLAY with numerous rootlets. (TOPSOIL)	<div style="text-align: right;">1</div>	
								'Firm' light brown mottled slightly sandy CLAY. Sand is fine. (GLACIAL TILL)		
		1.00	SPT	N=16 (2,3/3,4,4,5)				'Soft' greyish brown laminated CLAY with very closely spaced fine sand partings. (GLACIAL TILL)		<div style="text-align: right;">2</div>
		2.00	SPT	N=7 (1,1/1,2,2,2)	2.00	23.60				<div style="text-align: right;">3</div>
		3.00	SPT	N=4 (1,1/1,1,1,1)					<div style="text-align: right;">4</div>	
					3.45	22.15		End of Borehole at 3.45m	<div style="text-align: right;">5</div>	
Remarks: Borehole complete at 3.45m bgl. No groundwater encountered. Backfilled with arisings upon completion.										

Borehole Log

Borehole No.

WS104

Sheet 1 of 1

Project Name: **Whinney Hill**

Project No. **N16055**

Co-ords: **425550E - 584622N**

Hole Type **BH**

Location: **Guide Post, Northumberland**

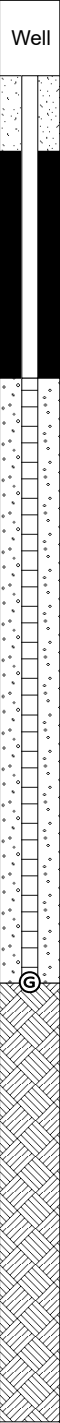





Level (m AOD): **27.50**

Scale
1:25



Client: **Dysart Developments**


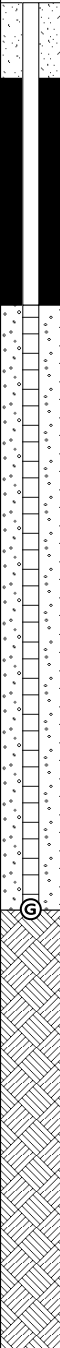

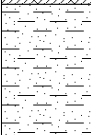
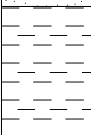
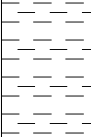
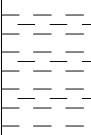

Dates: **13/06/2016**



Logged By
TD

Well	Water Strikes	Sample and In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description	
		Depth (m bgl)	Type	Results					
					0.30	27.20		Grass over dark brown friable slightly sandy organic CLAY with numerous rootlets. (TOPSOIL)	1
								'Loose' orange brown clayey fine SAND. (GLACIAL SAND)	
		1.00	SPT	N=4 (1,1/1,1,1,1)					
		1.50			1.50	26.00			
		2.00	SPT	N=4 (1,0/1,1,1,1)					2
		3.00	SPT	N=4 (1,1/1,1,1,1)					3
		4.00	SPT	N=4 (1,0/1,1,1,1)					4
		4.45			4.45	23.05			5
End of Borehole at 4.45m									

Remarks: Borehole complete at 3.45m bgl.
Groundwater encountered at 1.70m bgl.
Monitoring well installed upon completion.

					<h1>Borehole Log</h1>			Borehole No. WS201 Sheet 1 of 1		
Project Name: Whinney Hill					Project No. N16055		Co-ords: 425571E - 584430N		Hole Type BH	
Location: Guide Post, Northumberland							Level (m AOD): 23.90		Scale 1:25	
Client: Dysart Developments							Dates: 14/06/2016		Logged By TD	
Well	Water Strikes	Sample and In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
		Depth (m bgl)	Type	Results						
					0.30	23.60		Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)		
								'Firm' light greyish brown slightly sandy very closely fissured CLAY. Sand is fine. (GLACIAL TILL)		
		1.00	SPT	N=11 (1,2/2,3,3,3)	1.00	22.90		'Firm' greyish orange brown laminated CLAY with very closely spaced fine sand partings and occasional wood fragments. (GLACIAL TILL)	1	
		2.00	SPT	N=7 (1,1/1,2,2,2)					2	
		3.00	SPT	N=5 (1,1/1,1,1,2)					3	
		4.00	SPT	N=4 (1,0/1,1,1,1)					4	
					4.45	19.45		End of Borehole at 4.45m	5	
Remarks: Borehole complete at 4.45m bgl. No groundwater encountered. Backfilled with arisings upon completion.										

				<h1>Borehole Log</h1>			Borehole No. WS202 Sheet 1 of 1		
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425695E - 584523N		Hole Type BH	
Location: Guide Post, Northumberland						Level (m AOD): 23.70		Scale 1:25	
Client: Dysart Developments						Dates: 14/06/2016		Logged By TD	
Well	Water Strikes	Sample and In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description	
		Depth (m bgl)	Type	Results					
					0.25	23.45		Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)	
					0.70	23.00		'Firm' light brown mottled slightly sandy CLAY. Sand is fine. (GLACIAL TILL)	
								'Firm' greyish brown CLAY. (GLACIAL TILL)	
									
									
		1.00	SPT	N=11 (1,2/2,3,3,3)					1
		2.00	SPT	N=5 (1,1/1,1,1,2)					2
								Groundwater encountered at 2.10m bgl.	
		3.00	SPT	N=4 (1,1/1,1,1,1)					3
		4.00	SPT	N=6 (1,1/1,1,2,2)					4
					4.45	19.25		End of Borehole at 4.45m	
									5
Remarks: Borehole complete at 4.45m bgl. Groundwater encountered at 2.10m bgl. Monitoring well installed upon completion.									

					<h1>Borehole Log</h1>			Borehole No. WS203 Sheet 1 of 1		
Project Name: Whinney Hill					Project No. N16055		Co-ords: 425730E - 584628N		Hole Type BH	
Location: Guide Post, Northumberland							Level (m AOD): 23.20		Scale 1:25	
Client: Dysart Developments							Dates: 14/06/2016		Logged By TD	
Well	Water Strikes	Sample and In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description		
		Depth (m bgl)	Type	Results						
					0.30	22.90		Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)	1	
					0.50	22.70		'Loose' light brown clayey fine SAND. (GLACIAL SAND)		
								'Firm' light greyish brown slightly sandy CLAY. Sand is fine. (GLACIAL TILL)		
		1.00	SPT	N=9 (1,2/2,2,2,3)						
		2.00	SPT	N=8 (1,1/2,2,2,2)						2
		3.00	SPT	N=6 (1,1/1,1,2,2)	2.90	20.30		'Soft' greyish brown laminated CLAY with very closely spaced fine sand partings and occasional wood fragments. (GLACIAL TILL)	3	
		4.00	SPT	N=5 (1,1/1,1,1,2)					4	
					4.45	18.75		End of Borehole at 4.45m	5	
Remarks: Borehole complete at 4.45m bgl. No groundwater encountered. Backfilled with arisings upon completion.										

Borehole Log

Borehole No.

WS401

Sheet 1 of 1

Project Name: **Whinney Hill**

Project No.
N16055

Co-ords: **425474E - 584750N**

Hole Type
BH

Location: **Guide Post, Northumberland**



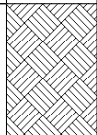
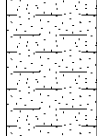
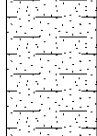
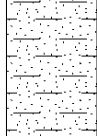
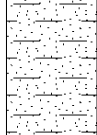
Level (m AOD): **31.50**

Scale
1:25

Client: **Dysart Developments**

Dates: **14/06/2016**

Logged By
TD

Well	Water Strikes	Sample and In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description	
		Depth (m bgl)	Type	Results					
		0.10	ES		0.45	31.05		Grass over dark brown slightly clayey fine to medium organic SAND. (TOPSOIL)	
		1.00	SPT	N=3 (1,0/1,1,0,1)				'Loose' orange brown slightly clayey fine to medium SAND with widely spaced pockets of laminated CLAY. (GLACIAL SAND)	1
		2.00	SPT	N=4 (1,1/1,1,1,1)					2
		3.00	SPT	N=4 (1,0/1,1,1,1)					3
					3.45	28.05		Groundwater encountered at 2.00m bgl. Becomes grey from 2.00m bgl.	
								End of Borehole at 3.45m	
									4
									5

Remarks: Borehole complete at 3.45m bgl.
Groundwater encountered at 2.00m bgl.
Monitoring well installed upon completion.

Borehole Log

Borehole No.

WS402

Sheet 1 of 1

Project Name: **Whinney Hill**

Project No. **N16055**

Co-ords: **425537E - 584702N**

Hole Type **BH**

Location: **Guide Post, Northumberland**

Level (m AOD): **29.30**

Scale
1:25


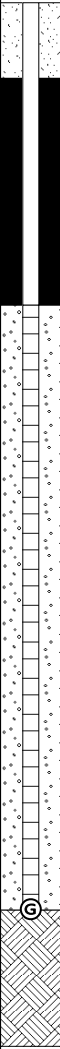
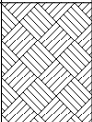

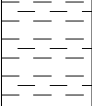
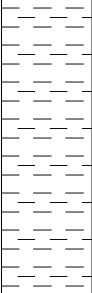

Client: **Dysart Developments**

Dates: **14/06/2016**

Logged By
TD

Well	Water Strikes	Sample and In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description	
		Depth (m bgl)	Type	Results					
		0.10	ES		0.35	28.95		Grass over dark brown slightly clayey fine to medium organic SAND. (TOPSOIL)	
		1.00	SPT	N=5 (1,1/2,1,1,1)				'Loose' orange brown clayey fine to medium SAND with closely spaced pockets of laminated CLAY. (GLACIAL SAND)	1
	▼	2.00	SPT	N=2 (1,0/1,0,1,0)				Groundwater encountered at 2.00m bgl. Becomes grey from 2.00m bgl.	2
		3.00	SPT	N=4 (1,0/1,1,1,1)	3.00	26.30			3
								End of Borehole at 3.45m	4
									5

Remarks: Borehole complete at 3.45m bgl.
No groundwater encountered.
Backfilled with arisings upon completion.

				<h1 style="text-align: center;">Borehole Log</h1>				Borehole No. WS403 Sheet 1 of 1	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425587E - 584664N		Hole Type BH	
Location: Guide Post, Northumberland						Level (m AOD): 26.00		Scale 1:25	
Client: Dysart Developments						Dates: 14/06/2016		Logged By TD	
Well	Water Strikes	Sample and In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description	
		Depth (m bgl)	Type	Results					
		0.10	ES				 Grass over dark brown slightly clayey fine to medium organic SAND. (TOPSOIL)		
		0.40	ES		0.40 0.50	25.60 25.50	 'Loose' light orange brown clayey fine to medium SAND. (GLACIAL SAND)		
		1.00	SPT	N=4 (1,0/1,1,1,1)			 'Firm' greyish brown CLAY. (GLACIAL TILL)	1	
		2.00	SPT	N=4 (1,1/1,1,1,1)			 <u>Becomes laminated from 2.00m bgl.</u>	2	
		3.00	SPT	N=7 (1,1/1,2,2,2)				3	
					3.45	22.55	End of Borehole at 3.45m	4	
								5	
Remarks: Borehole complete at 3.45m bgl. No groundwater encountered. Monitoring well installed upon completion.									

Rotary Open Hole Log

Borehole No.

ROH1

Sheet 1 of 2

Project Name: **Whinney Hill**

Project No. **N16055**

Co-ords: **425770E - 584514N**

Hole Type **RO**

Location: **Guide Post, Northumberland**

Level (m AOD): **22.90**

Scale
1:150

Client: **Dysart Developments**

Dates: **20/06/2016 - 21/06/2016**

Logged By
Van Elle Ltd

Well	Water Strikes	Sample and In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description	
		Depth (m bgl)	Type	Results					
					0.30	22.60		Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)	1
					0.50	22.40		Stiff brown slightly gravelly CLAY. Gravel is sub-angular medium to coarse of mixed lithologies including sandstone. (GLACIAL TILL)	2
								SAND AND GRAVEL. (GLACIAL SAND AND GRAVEL)	3
									4
									5
									6
									7
									8
									9
									10
									11
									12
									13
									14
									15
									16
									17
									18
									19
									20
									21
									22
									23
									24
									25
									26
									27
									28
									29
									30

Continued on Next Sheet

Remarks: Borehole complete at 46.20m bgl.
Cased to 39.00m bgl.
Backfilled with arisings and sealed with bentonite and concrete plug upon completion.



Rotary Open Hole Log

Borehole No.

ROH1

Sheet 2 of 2

Project Name: **Whinney Hill**

Project No. **N16055**

Co-ords: **425770E - 584514N**

Hole Type **RO**

Location: **Guide Post, Northumberland**

Level (m AOD): **22.90**

Scale
1:150

Client: **Dysart Developments**

Dates: **20/06/2016 - 21/06/2016**

Logged By
Van Elle Ltd

Well	Water Strikes	Sample and In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description	
		Depth (m bgl)	Type	Results					
					37.50	-14.60			31
									32
									33
									34
									35
									36
									37
								MUDSTONE. (PENNINE MIDDLE COAL MEASURES)	38
									39
									40
									41
					42.00	-19.10			42
								Traces of soft COAL. (PENNINE MIDDLE COAL MEASURES)	43
					43.45	-20.55		<i>Full recovery.</i>	44
								MUDSTONE. (PENNINE MIDDLE COAL MEASURES)	45
					44.50	-21.60			46
					45.20	-22.30		COAL. (PENNINE MIDDLE COAL MEASURES)	47
								MUDSTONE. (PENNINE MIDDLE COAL MEASURES)	48
					46.20	-23.30			49
								End of Borehole at 46.20m	50
									51
									52
									53
									54
									55
									56
									57
									58
									59
									60

Remarks: Borehole complete at 46.20m bgl.
Cased to 39.00m bgl.
Backfilled with arisings and sealed with bentonite and concrete plug upon completion.



Rotary Open Hole Log

Borehole No.

ROH2

Sheet 1 of 2

Project Name: **Whinney Hill**

Project No. **N16055**

Co-ords: **425575E - 584411N**

Hole Type **RO**

Location: **Guide Post, Northumberland**

Level (m AOD): **23.82**

Scale **1:150**

Client: **Dysart Developments**

Dates: **22/06/2016**

Logged By **Van Elle Ltd**

Well	Water Strikes	Sample and In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description	
		Depth (m bgl)	Type	Results					
					0.30	23.52		Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)	1
					0.50	23.32		Stiff brown slightly gravelly CLAY. Gravel is sub-angular medium to coarse of mixed lithologies including sandstone. (GLACIAL TILL)	2
								SAND AND GRAVEL with occasional bands of clay. (GLACIAL SAND AND GRAVEL)	3
									4
									5
									6
									7
									8
									9
									10
									11
									12
									13
									14
									15
									16
									17
									18
									19
									20
									21
									22
									23
									24
									25
									26
									27
					28.00	-4.18		MUDSTONE. (PENNINE MIDDLE COAL MEASURES)	28
									29
									30

Continued on Next Sheet

Remarks: Borehole complete at 45.00m bgl.
Cased to 30.00m bgl.
Backfilled with arisings and sealed with bentonite and concrete plug upon completion.


Rotary Open Hole Log

Borehole No.

ROH2

Sheet 2 of 2

Project Name: **Whinney Hill**

Project No. **N16055**

Co-ords: **425575E - 584411N**

Hole Type **RO**

Location: **Guide Post, Northumberland**

Level (m AOD): **23.82**

Scale **1:150**

Client: **Dysart Developments**

Dates: **22/06/2016**

Logged By **Van Elle Ltd**

Well	Water Strikes	Sample and In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description	
		Depth (m bgl)	Type	Results					
									31
									32
									33
									34
									35
					36.00	-12.18			36
					36.50	-12.68		Traces of COAL. (PENNINE MIDDLE COAL MEASURES) MUDSTONE. (PENNINE MIDDLE COAL MEASURES)	37
									38
									39
					40.00	-16.18			40
					40.70	-16.88		COAL. (PENNINE MIDDLE COAL MEASURES) MUDSTONE. (PENNINE MIDDLE COAL MEASURES)	41
									42
									43
									44
					45.00	-21.18		End of Borehole at 45.00m	45
									46
									47
									48
									49
									50
									51
									52
									53
									54
									55
									56
									57
									58
									59
									60

Remarks: Borehole complete at 45.00m bgl.
Cased to 30.00m bgl.
Backfilled with arisings and sealed with bentonite and concrete plug upon completion.



Rotary Open Hole Log

Borehole No.

ROH3

Sheet 1 of 2

Project Name: **Whinney Hill**

Project No. **N16055**

Co-ords: **425737E - 584713N**

Hole Type **RO**

Location: **Guide Post, Northumberland**

Level (m AOD): **24.10**

Scale
1:150



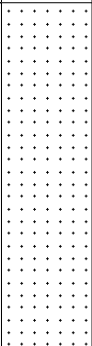


Client: **Dysart Developments**

Dates: **22/06/2016**

Logged By
Van Elle Ltd


Well	Water Strikes	Sample and In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description	
		Depth (m bgl)	Type	Results					
					0.30	23.80		Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)	1
					0.50	23.60		Stiff brown slightly gravelly CLAY. Gravel is sub-angular medium to coarse of mixed lithologies including sandstone. (GLACIAL TILL)	2
								SAND AND GRAVEL with occasional bands of clay. (GLACIAL SAND AND GRAVEL)	3
									4
									5
									6
									7
									8
									9
									10
									11
									12
									13
									14
									15
									16
									17
									18
									19
									20
									21
									22
									23
									24
									25
									26
									27
									28
									29
					29.70	-5.60		Continued on Next Sheet	30

Remarks: Borehole complete at 45.00m bgl.
Cased to 30.00m bgl.
Backfilled with arisings and sealed with bentonite and concrete plug upon completion.

				<h1>Rotary Open Hole Log</h1>				Borehole No. ROH3 Sheet 2 of 2	
Project Name: Whinney Hill				Project No. N16055		Co-ords: 425737E - 584713N		Hole Type RO	
Location: Guide Post, Northumberland						Level (m AOD): 24.10		Scale 1:150	
Client: Dysart Developments						Dates: 22/06/2016		Logged By Van Elle Ltd	
Well	Water Strikes	Sample and In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description	
		Depth (m bgl)	Type	Results					
								SANDSTONE. (PENNINE MIDDLE COAL MEASURES)	31
									32
									33
									34
									35
									36
									37
									38
									39
									40
					37.00	-12.90		COAL. (PENNINE MIDDLE COAL MEASURES)	37
					37.60	-13.50		MUDSTONE. (PENNINE MIDDLE COAL MEASURES)	38
									39
									40
									41
									42
									43
									44
									45
									46
				45.00	-20.90	End of Borehole at 45.00m			45
								46	
								47	
								48	
								49	
								50	
								51	
								52	
								53	
								54	
								55	
								56	
								57	
								58	
								59	
								60	

Remarks:

Borehole complete at 45.00m bgl.
 Cased to 30.00m bgl.
 Backfilled with arisings and sealed with bentonite and concrete plug upon completion.



Rotary Open Hole Log

Borehole No.

ROH4

Sheet 1 of 2

Project Name: **Whinney Hill**

Project No. **N16055**

Co-ords: **425477E - 584417N**

Hole Type **RO**

Location: **Guide Post, Northumberland**

Level (m AOD): **25.60**

Scale
1:150



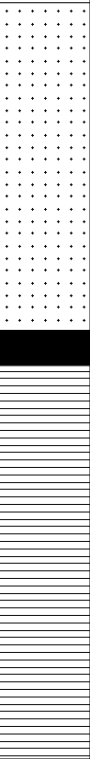


Client: **Dysart Developments**

Dates: **24/06/2016**

Logged By
Van Elle Ltd

Well	Water Strikes	Sample and In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description	
		Depth (m bgl)	Type	Results					
					0.30 0.50	25.30 25.10		Grass over dark brown friable slightly sandy organic CLAY. (TOPSOIL) Stiff brown slightly gravelly CLAY. Gravel is sub-angular medium to coarse of mixed lithologies including sandstone. (GLACIAL TILL) SAND AND GRAVEL. (GLACIAL SAND AND GRAVEL)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
					26.00	-0.40		SANDSTONE. (PENNINE MIDDLE COAL MEASURES)	26 27 28 29 30
Continued on Next Sheet									

Remarks: Borehole complete at 45.00m bgl.
Cased to 27.00m bgl.
Backfilled with arisings and sealed with bentonite and concrete plug upon completion.

					<h1>Rotary Open Hole Log</h1>			Borehole No. ROH4 Sheet 2 of 2			
Project Name: Whinney Hill					Project No. N16055		Co-ords: 425477E - 584417N		Hole Type RO		
Location: Guide Post, Northumberland					Level (m AOD): 25.60			Scale 1:150			
Client: Dysart Developments					Dates: 24/06/2016			Logged By Van Elle Ltd			
Well	Water Strikes	Sample and In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description			
		Depth (m bgl)	Type	Results							
									31		
										32	
											33
											34
											35
											36
		36.50				-10.90				COAL. (PENNINE MIDDLE COAL MEASURES)	37
		37.20				-11.60				MUDSTONE. (PENNINE MIDDLE COAL MEASURES)	38
											39
											40
											41
											42
											43
											44
		45.00				-19.40				End of Borehole at 45.00m	45
											46
											47
											48
											49
											50
							51				
							52				
							53				
							54				
							55				
							56				
							57				
							58				
							59				
							60				
Remarks: Borehole complete at 45.00m bgl. Cased to 27.00m bgl. Backfilled with arisings and sealed with bentonite and concrete plug upon completion.											

Rotary Open Hole Log

Borehole No.

ROH5

Sheet 1 of 2

Project Name: **Whinney Hill**

Project No.
N16055

Co-ords: 425486E - 584417N

Hole Type
RO

Location: Guide Post, Northumberland

Level (m AOD): 26.60

Scale
1:150

Client: Dysart Developments

Dates: 23/06/2016

Logged By
Van Elle Ltd

Well	Water Strikes	Sample and In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description	
		Depth (m bgl)	Type	Results					
					0.30	26.30		Crop over dark brown friable slightly sandy organic CLAY. (TOPSOIL)	1
					0.50	26.10		Stiff brown slightly gravelly CLAY. Gravel is sub-angular medium to coarse of mixed lithologies including sandstone. (GLACIAL TILL)	2
								SAND AND GRAVEL. (GLACIAL SAND AND GRAVEL)	3
									4
									5
									6
									7
									8
									9
									10
									11
									12
									13
									14
									15
									16
									17
									18
									19
									20
									21
									22
									23
									24
									25
									26
									27
					28.00	-1.40		SANDSTONE. (PENNINE MIDDLE COAL MEASURES)	28
									29
									30
Continued on Next Sheet									

Remarks: Borehole complete at 45.00m bgl.
Cased to 27.00m bgl.
Backfilled with arisings and sealed with bentonite and concrete plug upon completion.



Rotary Open Hole Log

Borehole No.

ROH6

Sheet 1 of 2

Project Name: **Whinney Hill**

Project No. **N16055**

Co-ords: **425444E - 584723N**

Hole Type **RO**

Location: **Guide Post, Northumberland**

Level (m AOD): **33.55**

Scale **1:150**

Client: **Dysart Developments**

Dates: **23/06/2016**

Logged By **Van Elle Ltd**

Well	Water Strikes	Sample and In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description	
		Depth (m bgl)	Type	Results					
					0.30	33.25		Grass over dark brown friable slightly sandy organic CLAY. (TOPSOIL)	1
					0.50	33.05		Stiff brown slightly gravelly CLAY. Gravel is sub-angular medium to coarse of mixed lithologies including sandstone. (GLACIAL TILL)	2
								SAND AND GRAVEL with occasional bands of clay. (GLACIAL SAND AND GRAVEL)	3
									4
									5
									6
									7
									8
									9
									10
									11
									12
									13
									14
									15
									16
									17
									18
									19
									20
									21
									22
									23
									24
									25
									26
									27
					28.00	5.55		SANDSTONE. (PENNINE MIDDLE COAL MEASURES)	28
									29
									30

Continued on Next Sheet

Remarks: Borehole complete at 45.00m bgl.
Cased to 27.00m bgl.
Backfilled with arisings and sealed with bentonite and concrete plug upon completion.



Rotary Open Hole Log

Borehole No.

ROH6

Sheet 2 of 2

Project Name: **Whinney Hill**

Project No.
N16055

Co-ords: 425444E - 584723N

Hole Type
RO

Location: Guide Post, Northumberland

Level (m AOD): 33.55

Scale
1:150

Client: Dysart Developments

Dates: 23/06/2016

Logged By
Van Elle Ltd

Well	Water Strikes	Sample and In Situ Testing			Depth (m bgl)	Level (m AOD)	Legend	Stratum Description	
		Depth (m bgl)	Type	Results					
									31
									32
									33
									34
									35
									36
									37
									38
									39
									40
									41
									42
									43
									44
					45.00	-11.45			45
								End of Borehole at 45.00m	46
									47
									48
									49
									50
									51
									52
									53
									54
									55
									56
									57
									58
									59
									60

Remarks: Borehole complete at 45.00m bgl.
Cased to 27.00m bgl.
Backfilled with arisings and sealed with bentonite and concrete plug upon completion.

Appendix C

Chemical Analysis Results



Certificate of Analysis

Certificate Number 16-71226

05-Jul-16

Client Patrick Parson Consulting Engineering
Waterloo House
Thornton Street
Newcastle upon Tyne
NE1 4AP

Our Reference 16-71226

Client Reference N16055

Order No N16055/TD/1943

Contract Title Whinney Hill Farm, Guide Post, Northumberland

Description 2 Soil samples.

Date Received 29-Jun-16

Date Started 29-Jun-16

Date Completed 05-Jul-16

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the scope of UKAS accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. Observations and interpretations are outside the scope of ISO 17025. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

A handwritten signature in black ink, appearing to read 'Rob Brown'.

Rob Brown
Business Manager



Summary of Chemical Analysis

Matrix Descriptions

Our Ref 16-71226

Client Ref N16055

Contract Title Whinney Hill Farm, Guide Post, Northumberland

Sample ID	Lab No	Completed	Matrix Description
TP303	1014881	05/07/2016	Brown, gravelly, sandy CLAY including numerous rootlets
TP403	1014882	05/07/2016	Brown, gravelly, sandy CLAY including numerous rootlets

Summary of Chemical Analysis

Soil Samples

Our Ref 16-71226

Client Ref N16055

Contract Title Whinney Hill Farm, Guide Post, Northumberland

Lab No	1014881	1014882
Sample ID	TP303	TP403
Depth		
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	23/06/16	23/06/16
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Metals					
Arsenic	DETSC 2301#	0.2	mg/kg	7.9	7.5
Cadmium	DETSC 2301#	0.1	mg/kg	0.2	0.2
Chromium	DETSC 2301#	0.15	mg/kg	13	13
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	21	15
Lead	DETSC 2301#	0.3	mg/kg	52	50
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	0.13
Nickel	DETSC 2301#	1	mg/kg	11	10
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	84	71
Inorganics					
pH	DETSC 2008#			6.7	6.4
Total Organic Carbon	DETSC 2002	0.1	%	4.7	2.8
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	22	18
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.10	0.05
PAHs					
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6

Summary of Asbestos Analysis Soil Samples

Our Ref 16-71226

Client Ref N16055

Contract Title Whinney Hill Farm, Guide Post, Northumberland

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1014881	TP303	SOIL	NAD	none	Colin Patrick
1014882	TP403	SOIL	NAD	none	Colin Patrick

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 16-71226
 Client Ref N16055
 Contract Whinney Hill Farm, Guide Post, Northumberland

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1014881	TP303 SOIL	23/06/16	GJ 250ml, GJ 60ml, PT 1L		
1014882	TP403 SOIL	23/06/16	GJ 250ml, GJ 60ml, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.
Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :- Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETS 2002	Organic matter	%	0.1	Air Dried	No	Yes	Yes
DETS 2003	Loss on ignition	%	0.01	Air Dried	No	Yes	Yes
DETS 2008	pH	pH Units	1	Air Dried	No	Yes	Yes
DETS 2024	Sulphide	mg/kg	10	Air Dried	No	Yes	Yes
DETS 2076	Sulphate Aqueous Extract as SO ₄	mg/l	10	Air Dried	No	Yes	Yes
DETS 2084	Total Carbon	%	0.5	Air Dried	No	Yes	Yes
DETS 2084	Total Organic Carbon	%	0.5	Air Dried	No	Yes	Yes
DETS 2119	Ammoniacal Nitrogen as N	mg/kg	0.5	Air Dried	No	Yes	Yes
DETS 2130	Cyanide free	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS 2130	Cyanide total	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS 2130	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETS 2130	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETS 2321	Total Sulphate as SO ₄	%	0.01	Air Dried	No	Yes	Yes
DETS 2325	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETS 3049	Sulphur (free)	mg/kg	0.75	Air Dried	No	Yes	Yes
DETS 2123	Boron (water soluble)	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS 2301	Arsenic	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS 2301	Barium	mg/kg	1.5	Air Dried	No	Yes	Yes
DETS 2301	Beryllium	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS 2301	Cadmium Available	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS 2301	Cadmium	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS 2301	Cobalt	mg/kg	0.7	Air Dried	No	Yes	Yes
DETS 2301	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes
DETS 2301	Copper	mg/kg	0.2	Air Dried	No	Yes	Yes
DETS 2301	Manganese	mg/kg	20	Air Dried	No	Yes	Yes
DETS 2301	Molybdenum	mg/kg	0.4	Air Dried	No	Yes	Yes
DETS 2301	Nickel	mg/kg	1	Air Dried	No	Yes	Yes
DETS 2301	Lead	mg/kg	0.3	Air Dried	No	Yes	Yes
DETS 2301	Selenium	mg/kg	0.5	Air Dried	No	Yes	Yes
DETS 2301	Zinc	mg/kg	1	Air Dried	No	Yes	Yes
DETS 3072	Ali/Aro C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C10-C12	mg/kg	1.5	As Received	No	Yes	Yes
DETS 3072	Aliphatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C12-C16	mg/kg	1.2	As Received	No	Yes	Yes
DETS 3072	Aliphatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C16-C21	mg/kg	1.5	As Received	No	Yes	Yes
DETS 3072	Aliphatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETS 3072	Aliphatic C21-C35	mg/kg	3.4	As Received	No	Yes	Yes
DETS 3072	Aromatic C10-C12	mg/kg	0.9	As Received	No	Yes	Yes
DETS 3072	Aromatic C10-C12	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C10-C35	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C12-C16	mg/kg	0.5	As Received	No	Yes	Yes
DETS 3072	Aromatic C12-C16	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C16-C21	mg/kg	0.6	As Received	No	Yes	Yes
DETS 3072	Aromatic C16-C21	mg/kg	10	As Received	No	Yes	Yes
DETS 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 3072	Aromatic C21-C35	mg/kg	1.4	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	m+p Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	o Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3311	C10-C24 Diesel Range Organics (DRO)	mg/kg	10	As Received	No	Yes	Yes
DETS 3311	C24-C40 Lube Oil Range Organics (LORO)	mg/kg	10	As Received	No	Yes	Yes
DETS 3311	EPH (C10-C40)	mg/kg	10	As Received	No	Yes	Yes

Appendix A - Details of Analysis

Method	Parameter	Units	Limit of Detection	Sample Preparation	Sub-Contracted	UKAS	MCERTS
DETS 3303	Acenaphthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Acenaphthylene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(a)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(a)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(b)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(k)fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Benzo(g,h,i)perylene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Dibenzo(a,h)anthracene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Fluoranthene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Indeno(1,2,3-c,d)pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Naphthalene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Phenanthrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3303	Pyrene	mg/kg	0.03	As Received	No	Yes	Yes
DETS 3401	PCB 28 + PCB 31	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 52	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 101	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 118	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 153	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 138	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB 180	mg/kg	0.01	As Received	No	Yes	Yes
DETS 3401	PCB Total	mg/kg	0.01	As Received	No	Yes	Yes

Method details are shown only for those determinands listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.



Certificate of Analysis

Certificate Number 16-70459

29-Jun-16

Client Patrick Parson Consulting Engineering
Waterloo House
Thornton Street
Newcastle upon Tyne
NE1 4AP

Our Reference 16-70459

Client Reference N16055

Order No N16055/TD/1931

Contract Title Whinney Hill Farm, Guide Post, Northumberland

Description 13 Soil samples.

Date Received 22-Jun-16

Date Started 22-Jun-16

Date Completed 29-Jun-16

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the scope of UKAS accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. Observations and interpretations are outside the scope of ISO 17025. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

A handwritten signature in black ink, appearing to read 'Rob Brown'.

Rob Brown
Business Manager



Summary of Chemical Analysis

Soil Samples

Our Ref 16-70459

Client Ref N16055

Contract Title Whinney Hill Farm, Guide Post, Northumberland

Lab No	1010491	1010492	1010493	1010494	1010495	1010496	1010497
Sample ID	WS401	WS402	WS403	TP101	TP102	TP104	TP107
Depth	0.10	0.10	0.10	0.40	0.40	0.10	0.10
Other ID							
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	13/06/16	13/06/16	13/06/16	13/06/16	13/06/16	13/06/16	13/06/16
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units							
Metals										
Arsenic	DETS 2301#	0.2	mg/kg	7.2		8.8	10	5.8	9.9	7.3
Cadmium	DETS 2301#	0.1	mg/kg	0.2		0.3	0.3	< 0.1	1.0	0.2
Chromium	DETS 2301#	0.15	mg/kg	12		15	20	16	21	27
Chromium, Hexavalent	DETS 2204*	1	mg/kg	< 1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETS 2301#	0.2	mg/kg	20		23	30	17	52	22
Lead	DETS 2301#	0.3	mg/kg	40		56	57	25	270	43
Mercury	DETS 2325#	0.05	mg/kg	0.12		0.18	0.12	0.10	0.15	0.07
Nickel	DETS 2301#	1	mg/kg	11		13	20	15	24	20
Selenium	DETS 2301#	0.5	mg/kg	< 0.5		< 0.5	< 0.5	< 0.5	< 0.5	0.5
Zinc	DETS 2301#	1	mg/kg	71		92	110	67	320	72
Inorganics										
pH	DETS 2008#			6.6		6.6	6.6	6.5	8.0	6.5
Total Organic Carbon	DETS 2002	0.1	%	3.1		3.3	4.4	1.5	4.0	3.7
Sulphate Aqueous Extract as SO4	DETS 2076#	10	mg/l	13		< 10	19	< 10	49	18
Sulphate as SO4, Total	DETS 2321#	0.01	%	0.05		0.07	0.07	0.03	0.08	0.08
Petroleum Hydrocarbons										
Aliphatic C5-C6	DETS 3321*	0.01	mg/kg		< 0.01		< 0.01	< 0.01		
Aliphatic C6-C8	DETS 3321*	0.01	mg/kg		< 0.01		< 0.01	< 0.01		
Aliphatic C8-C10	DETS 3321*	0.01	mg/kg		< 0.01		< 0.01	< 0.01		
Aliphatic C10-C12	DETS 3072#	1.5	mg/kg		< 1.5		< 1.5	< 1.5		
Aliphatic C12-C16	DETS 3072#	1.2	mg/kg		< 1.2		< 1.2	< 1.2		
Aliphatic C16-C21	DETS 3072#	1.5	mg/kg		< 1.5		< 1.5	< 1.5		
Aliphatic C21-C35	DETS 3072#	3.4	mg/kg		< 3.4		< 3.4	< 3.4		
Aliphatic C5-C35	DETS 3072*	10	mg/kg		< 10		< 10	< 10		
Aromatic C5-C7	DETS 3321*	0.01	mg/kg		< 0.01		< 0.01	< 0.01		
Aromatic C7-C8	DETS 3321*	0.01	mg/kg		< 0.01		< 0.01	< 0.01		
Aromatic C8-C10	DETS 3321*	0.01	mg/kg		< 0.01		< 0.01	< 0.01		
Aromatic C10-C12	DETS 3072#	0.9	mg/kg		< 0.9		< 0.9	< 0.9		
Aromatic C12-C16	DETS 3072#	0.5	mg/kg		< 0.5		< 0.5	< 0.5		
Aromatic C16-C21	DETS 3072#	0.6	mg/kg		< 0.6		< 0.6	2.7		
Aromatic C21-C35	DETS 3072#	1.4	mg/kg		< 1.4		< 1.4	11		
Aromatic C5-C35	DETS 3072*	10	mg/kg		< 10		< 10	13		
TPH Ali/Aro Total	DETS 3072*	10	mg/kg		< 10		< 10	13		

Summary of Chemical Analysis

Soil Samples

Our Ref 16-70459

Client Ref N16055

Contract Title Whinney Hill Farm, Guide Post, Northumberland

Lab No	1010491	1010492	1010493	1010494	1010495	1010496	1010497
Sample ID	WS401	WS402	WS403	TP101	TP102	TP104	TP107
Depth	0.10	0.10	0.10	0.40	0.40	0.10	0.10
Other ID							
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	13/06/16	13/06/16	13/06/16	13/06/16	13/06/16	13/06/16	13/06/16
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units							
PAHs										
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	0.4	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	0.9	0.2	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	0.7	0.2	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	0.6	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	0.4	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	0.6	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	0.2	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	0.7	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	0.5	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	0.2	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	0.6	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6		< 1.6	< 1.6	6.1	< 1.6	< 1.6
OCPs										
alpha-BHC	DETSC 3441*	0.1	mg/kg							< 0.1
gamma-BHC (Lindane)	DETSC 3441*	0.1	mg/kg							< 0.1
beta-BHC	DETSC 3441*	0.1	mg/kg							< 0.1
delta-BHC	DETSC 3441*	0.1	mg/kg							< 0.1
Heptachlor	DETSC 3441*	0.1	mg/kg							< 0.1
Aldrin	DETSC 3441*	0.1	mg/kg							< 0.1
Heptachlor epoxide	DETSC 3441*	0.1	mg/kg							< 0.1
gamma-Chlordane	DETSC 3441*	0.1	mg/kg							< 0.1
Endosulphan I & Alpha-chlorodane	DETSC 3441*	0.1	mg/kg							< 0.1
4,4-DDE	DETSC 3441*	0.1	mg/kg							< 0.1
Dieldrin	DETSC 3441*	0.1	mg/kg							< 0.1
Endrin	DETSC 3441*	0.1	mg/kg							< 0.1
Endosulphan II & 4,4-DDD	DETSC 3441*	0.1	mg/kg							< 0.1
Endrin aldehyde	DETSC 3441*	0.1	mg/kg							< 0.1
4,4-DDT	DETSC 3441*	0.1	mg/kg							< 0.1
Endosulphan sulphate	DETSC 3441*	0.1	mg/kg							< 0.1
Methoxychlor	DETSC 3441*	0.1	mg/kg							< 0.1
Endrin ketone	DETSC 3441*	0.1	mg/kg							< 0.1

Summary of Chemical Analysis

Soil Samples

Our Ref 16-70459

Client Ref N16055

Contract Title Whinney Hill Farm, Guide Post, Northumberland

Lab No	1010491	1010492	1010493	1010494	1010495	1010496	1010497
Sample ID	WS401	WS402	WS403	TP101	TP102	TP104	TP107
Depth	0.10	0.10	0.10	0.40	0.40	0.10	0.10
Other ID							
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	13/06/16	13/06/16	13/06/16	13/06/16	13/06/16	13/06/16	13/06/16
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
OPPs									
Dichlorvos	DETS 3443*	0.1	mg/kg						< 0.1
Mevinphos	DETS 3443*	0.1	mg/kg						< 0.1
Demeton-O	DETS 3443*	0.1	mg/kg						< 0.1
Ethoprop	DETS 3443*	0.1	mg/kg						< 0.1
Naled	DETS 3443*	0.1	mg/kg						< 0.1
Phorate	DETS 3443*	0.1	mg/kg						< 0.1
Demeton-S	DETS 3443*	0.1	mg/kg						< 0.1
Diazinon	DETS 3443*	0.1	mg/kg						< 0.1
Disulfoton	DETS 3443*	0.1	mg/kg						< 0.1
Methylparathion	DETS 3443*	0.1	mg/kg						< 0.1
Ronnel	DETS 3443*	0.1	mg/kg						< 0.1
Fenthion	DETS 3443*	0.1	mg/kg						< 0.1
Chlopyrifos	DETS 3443*	0.1	mg/kg						< 0.1
Trichlorinate	DETS 3443*	0.1	mg/kg						< 0.1
Merphos	DETS 3443*	0.1	mg/kg						< 0.1
Stirofos	DETS 3443*	0.1	mg/kg						< 0.1
Tokuthion	DETS 3443*	0.1	mg/kg						< 0.1
Fensulfothion	DETS 3443*	0.1	mg/kg						< 0.1
Bolstar	DETS 3443*	0.1	mg/kg						< 0.1
Azinphos methyl	DETS 3443*	0.1	mg/kg						< 0.1
Coumaphos	DETS 3443*	0.1	mg/kg						< 0.1

Summary of Chemical Analysis

Soil Samples

Our Ref 16-70459

Client Ref N16055

Contract Title Whinney Hill Farm, Guide Post, Northumber

Lab No	1010498	1010499	1010500	1010501	1010502	1010503
Sample ID	TP110	TP201	TP209	TP216	TP220	TP226
Depth	0.10	0.10	0.10	0.10	0.10	0.10
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	13/06/16	13/06/16	17/06/16	13/06/16	17/06/16	17/06/16
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Metals									
Arsenic	DETS 2301#	0.2	mg/kg	6.8	4.7		7.7	5.8	7.8
Cadmium	DETS 2301#	0.1	mg/kg	0.2	0.2		0.3	0.2	0.6
Chromium	DETS 2301#	0.15	mg/kg	28	14		28	19	21
Chromium, Hexavalent	DETS 2204*	1	mg/kg	< 1.0	< 1.0		< 1.0	< 1.0	< 1.0
Copper	DETS 2301#	0.2	mg/kg	20	10		23	13	49
Lead	DETS 2301#	0.3	mg/kg	41	32		51	43	79
Mercury	DETS 2325#	0.05	mg/kg	0.07	< 0.05		0.07	< 0.05	< 0.05
Nickel	DETS 2301#	1	mg/kg	18	12		19	12	23
Selenium	DETS 2301#	0.5	mg/kg	< 0.5	< 0.5		< 0.5	< 0.5	< 0.5
Zinc	DETS 2301#	1	mg/kg	74	51		77	47	290
Inorganics									
pH	DETS 2008#			6.6	6.6		7.0	6.8	7.2
Total Organic Carbon	DETS 2002	0.1	%	2.6	2.6		4.5	3.1	3.5
Sulphate Aqueous Extract as SO4	DETS 2076#	10	mg/l	17	14		40	24	23
Sulphate as SO4, Total	DETS 2321#	0.01	%	0.06	0.06		0.12	0.07	0.07
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETS 3321*	0.01	mg/kg			< 0.01	< 0.01		< 0.01
Aliphatic C6-C8	DETS 3321*	0.01	mg/kg			< 0.01	< 0.01		< 0.01
Aliphatic C8-C10	DETS 3321*	0.01	mg/kg			< 0.01	< 0.01		< 0.01
Aliphatic C10-C12	DETS 3072#	1.5	mg/kg			< 1.5	< 1.5		< 1.5
Aliphatic C12-C16	DETS 3072#	1.2	mg/kg			< 1.2	< 1.2		< 1.2
Aliphatic C16-C21	DETS 3072#	1.5	mg/kg			< 1.5	< 1.5		< 1.5
Aliphatic C21-C35	DETS 3072#	3.4	mg/kg			< 3.4	< 3.4		< 3.4
Aliphatic C5-C35	DETS 3072*	10	mg/kg			< 10	< 10		< 10
Aromatic C5-C7	DETS 3321*	0.01	mg/kg			< 0.01	< 0.01		< 0.01
Aromatic C7-C8	DETS 3321*	0.01	mg/kg			< 0.01	< 0.01		< 0.01
Aromatic C8-C10	DETS 3321*	0.01	mg/kg			< 0.01	< 0.01		< 0.01
Aromatic C10-C12	DETS 3072#	0.9	mg/kg			< 0.9	< 0.9		< 0.9
Aromatic C12-C16	DETS 3072#	0.5	mg/kg			< 0.5	< 0.5		< 0.5
Aromatic C16-C21	DETS 3072#	0.6	mg/kg			< 0.6	8.2		< 0.6
Aromatic C21-C35	DETS 3072#	1.4	mg/kg			< 1.4	37		< 1.4
Aromatic C5-C35	DETS 3072*	10	mg/kg			< 10	45		< 10
TPH Ali/Aro Total	DETS 3072*	10	mg/kg			< 10	45		< 10

Summary of Chemical Analysis

Soil Samples

Our Ref 16-70459

Client Ref N16055

Contract Title Whinney Hill Farm, Guide Post, Northumber

Lab No	1010498	1010499	1010500	1010501	1010502	1010503
Sample ID	TP110	TP201	TP209	TP216	TP220	TP226
Depth	0.10	0.10	0.10	0.10	0.10	0.10
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	13/06/16	13/06/16	17/06/16	13/06/16	17/06/16	17/06/16
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1		0.2	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1		0.5	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1		1.3	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1		2.1	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1		15	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1		3.9	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	0.2		22	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	0.2		16	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1		10	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1		9.7	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1		7.2	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1		4.2	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1		8.8	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1		5.9	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1		1.6	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1		5.3	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6		110	< 1.6	< 1.6
OCPs									
alpha-BHC	DETSC 3441*	0.1	mg/kg			< 0.1			
gamma-BHC (Lindane)	DETSC 3441*	0.1	mg/kg			< 0.1			
beta-BHC	DETSC 3441*	0.1	mg/kg			< 0.1			
delta-BHC	DETSC 3441*	0.1	mg/kg			< 0.1			
Heptachlor	DETSC 3441*	0.1	mg/kg			< 0.1			
Aldrin	DETSC 3441*	0.1	mg/kg			< 0.1			
Heptachlor epoxide	DETSC 3441*	0.1	mg/kg			< 0.1			
gamma-Chlordane	DETSC 3441*	0.1	mg/kg			< 0.1			
Endosulphan I & Alpha-chlorodane	DETSC 3441*	0.1	mg/kg			< 0.1			
4,4-DDE	DETSC 3441*	0.1	mg/kg			< 0.1			
Dieldrin	DETSC 3441*	0.1	mg/kg			< 0.1			
Endrin	DETSC 3441*	0.1	mg/kg			< 0.1			
Endosulphan II & 4,4-DDD	DETSC 3441*	0.1	mg/kg			< 0.1			
Endrin aldehyde	DETSC 3441*	0.1	mg/kg			< 0.1			
4,4-DDT	DETSC 3441*	0.1	mg/kg			< 0.1			
Endosulphan sulphate	DETSC 3441*	0.1	mg/kg			< 0.1			
Methoxychlor	DETSC 3441*	0.1	mg/kg			< 0.1			
Endrin ketone	DETSC 3441*	0.1	mg/kg			< 0.1			

Summary of Chemical Analysis Soil Samples

Our Ref 16-70459

Client Ref N16055

Contract Title Whinney Hill Farm, Guide Post, Northumber

Lab No	1010498	1010499	1010500	1010501	1010502	1010503
Sample ID	TP110	TP201	TP209	TP216	TP220	TP226
Depth	0.10	0.10	0.10	0.10	0.10	0.10
Other ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	13/06/16	13/06/16	17/06/16	13/06/16	17/06/16	17/06/16
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
OPPs									
Dichlorvos	DETS 3443*	0.1	mg/kg			< 0.1			
Mevinphos	DETS 3443*	0.1	mg/kg			< 0.1			
Demeton-O	DETS 3443*	0.1	mg/kg			< 0.1			
Ethoprop	DETS 3443*	0.1	mg/kg			< 0.1			
Naled	DETS 3443*	0.1	mg/kg			< 0.1			
Phorate	DETS 3443*	0.1	mg/kg			< 0.1			
Demeton-S	DETS 3443*	0.1	mg/kg			< 0.1			
Diazinon	DETS 3443*	0.1	mg/kg			< 0.1			
Disulfoton	DETS 3443*	0.1	mg/kg			< 0.1			
Methylparathion	DETS 3443*	0.1	mg/kg			< 0.1			
Ronnel	DETS 3443*	0.1	mg/kg			< 0.1			
Fenthion	DETS 3443*	0.1	mg/kg			< 0.1			
Chlopyrifos	DETS 3443*	0.1	mg/kg			< 0.1			
Trichlorinate	DETS 3443*	0.1	mg/kg			< 0.1			
Merphos	DETS 3443*	0.1	mg/kg			< 0.1			
Stirofos	DETS 3443*	0.1	mg/kg			< 0.1			
Tokuthion	DETS 3443*	0.1	mg/kg			< 0.1			
Fensulfothion	DETS 3443*	0.1	mg/kg			< 0.1			
Bolstar	DETS 3443*	0.1	mg/kg			< 0.1			
Azinphos methyl	DETS 3443*	0.1	mg/kg			< 0.1			
Coumaphos	DETS 3443*	0.1	mg/kg			< 0.1			

Summary of Asbestos Analysis

Soil Samples

Our Ref 16-70459

Client Ref N16055

Contract Title Whinney Hill Farm, Guide Post, Northumberland

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1010491	WS401 0.10	SOIL	NAD	none	Colin Patrick
1010493	WS403 0.10	SOIL	NAD	none	Colin Patrick
1010494	TP101 0.40	SOIL	NAD	none	Colin Patrick
1010495	TP102 0.40	SOIL	Chrysotile	Chrysotile cement sheet	Colin Patrick
1010496	TP104 0.10	SOIL	NAD	none	Colin Patrick
1010497	TP107 0.10	SOIL	NAD	none	Colin Patrick
1010498	TP110 0.10	SOIL	NAD	none	Colin Patrick
1010499	TP201 0.10	SOIL	NAD	none	Colin Patrick
1010501	TP216 0.10	SOIL	NAD	none	Colin Patrick
1010502	TP220 0.10	SOIL	NAD	none	Colin Patrick
1010503	TP226 0.10	SOIL	NAD	none	Colin Patrick

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * -not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 16-70459
 Client Ref N16055
 Contract Whinney Hill Farm, Guide Post, Northumberland

Containers Received & Deviating Samples

Lab No	Sample ID	Date		Containers Received	Holding time exceeded for tests	Inappropriate container for tests
		Sampled				
1010491	WS401 0.10 SOIL	13/06/16		GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
1010492	WS402 0.10 SOIL	13/06/16		GJ 250ml, GJ 60ml, PT 1L		
1010493	WS403 0.10 SOIL	13/06/16		GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
1010494	TP101 0.40 SOIL	13/06/16		GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
1010495	TP102 0.40 SOIL	13/06/16		GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
1010496	TP104 0.10 SOIL	13/06/16		GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
1010497	TP107 0.10 SOIL	13/06/16		GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
1010498	TP110 0.10 SOIL	13/06/16		GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
1010499	TP201 0.10 SOIL	13/06/16		GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
1010500	TP209 0.10 SOIL	17/06/16		GJ 250ml, GV, PT 1L		
1010501	TP216 0.10 SOIL	13/06/16		GJ 250ml, GJ 60ml, PT 1L	pH + Conductivity (7 days)	
1010502	TP220 0.10 SOIL	17/06/16		GJ 250ml, GV, PT 1L		
1010503	TP226 0.10 SOIL	17/06/16		GJ 250ml, GV, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub V-Vial

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months



Certificate of Analysis

Certificate Number 16-70548

29-Jun-16

Client Patrick Parson Consulting Engineering
Waterloo House
Thornton Street
Newcastle upon Tyne
NE1 4AP

Our Reference 16-70548

Client Reference N16055

Order No N16055/TD/1931

Contract Title Whinney Hill Farm, Guide Post, Northumberland

Description 2 Soil samples.

Date Received 23-Jun-16

Date Started 23-Jun-16

Date Completed 29-Jun-16

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the scope of UKAS accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. Observations and interpretations are outside the scope of ISO 17025. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

A handwritten signature in black ink, appearing to read 'Rob Brown'.

Rob Brown
Business Manager



Summary of Chemical Analysis

Soil Samples

Our Ref 16-70548

Client Ref N16055

Contract Title Whinney Hill Farm, Guide Post, Northumberland

Lab No	1010984	1010985
Sample ID	TP506	TP512
Depth	0.10	0.10
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	20/06/16	20/06/16
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Metals					
Arsenic	DETSC 2301#	0.2	mg/kg	12	6.0
Cadmium	DETSC 2301#	0.1	mg/kg	0.5	0.3
Chromium	DETSC 2301#	0.15	mg/kg	27	11
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	46	27
Lead	DETSC 2301#	0.3	mg/kg	90	47
Mercury	DETSC 2325#	0.05	mg/kg	0.16	0.07
Nickel	DETSC 2301#	1	mg/kg	26	18
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	0.6
Zinc	DETSC 2301#	1	mg/kg	150	95
Inorganics					
pH	DETSC 2008#			6.8	6.3
Total Organic Carbon	DETSC 2002	0.1	%	3.5	5.4
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	35	21
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.07	0.05
PAHs					
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1
PAH Total	DETSC 3301	1.6	mg/kg	< 1.6	< 1.6

Summary of Chemical Analysis

Soil Samples

Our Ref 16-70548

Client Ref N16055

Contract Title Whinney Hill Farm, Guide Post, Northumberland

Lab No	1010984	1010985
Sample ID	TP506	TP512
Depth	0.10	0.10
Other ID		
Sample Type	SOIL	SOIL
Sampling Date	20/06/16	20/06/16
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
OCPs					
alpha-BHC	DETSC 3441*	0.1	mg/kg		< 0.1
gamma-BHC (Lindane)	DETSC 3441*	0.1	mg/kg		< 0.1
beta-BHC	DETSC 3441*	0.1	mg/kg		< 0.1
delta-BHC	DETSC 3441*	0.1	mg/kg		< 0.1
Heptachlor	DETSC 3441*	0.1	mg/kg		< 0.1
Aldrin	DETSC 3441*	0.1	mg/kg		< 0.1
Heptachlor epoxide	DETSC 3441*	0.1	mg/kg		< 0.1
gamma-Chlordane	DETSC 3441*	0.1	mg/kg		< 0.1
Endosulphan I & Alpha-chlorodane	DETSC 3441*	0.1	mg/kg		< 0.1
4,4-DDE	DETSC 3441*	0.1	mg/kg		< 0.1
Dieldrin	DETSC 3441*	0.1	mg/kg		< 0.1
Endrin	DETSC 3441*	0.1	mg/kg		< 0.1
Endosulphan II & 4,4-DDD	DETSC 3441*	0.1	mg/kg		< 0.1
Endrin aldehyde	DETSC 3441*	0.1	mg/kg		< 0.1
4,4-DDT	DETSC 3441*	0.1	mg/kg		< 0.1
Endosulphan sulphate	DETSC 3441*	0.1	mg/kg		< 0.1
Methoxychlor	DETSC 3441*	0.1	mg/kg		< 0.1
Endrin ketone	DETSC 3441*	0.1	mg/kg		< 0.1
OPPs					
Dichlorvos	DETSC 3443*	0.1	mg/kg		< 0.1
Mevinphos	DETSC 3443*	0.1	mg/kg		< 0.1
Demeton-O	DETSC 3443*	0.1	mg/kg		< 0.1
Ethoprop	DETSC 3443*	0.1	mg/kg		< 0.1
Naled	DETSC 3443*	0.1	mg/kg		< 0.1
Phorate	DETSC 3443*	0.1	mg/kg		< 0.1
Demeton-S	DETSC 3443*	0.1	mg/kg		< 0.1
Diazinon	DETSC 3443*	0.1	mg/kg		< 0.1
Disulfoton	DETSC 3443*	0.1	mg/kg		< 0.1
Methylparathion	DETSC 3443*	0.1	mg/kg		< 0.1
Ronnel	DETSC 3443*	0.1	mg/kg		< 0.1
Fenthion	DETSC 3443*	0.1	mg/kg		< 0.1
Chlopyrifos	DETSC 3443*	0.1	mg/kg		< 0.1
Trichlorinate	DETSC 3443*	0.1	mg/kg		< 0.1
Merphos	DETSC 3443*	0.1	mg/kg		< 0.1
Stirofos	DETSC 3443*	0.1	mg/kg		< 0.1
Tokuthion	DETSC 3443*	0.1	mg/kg		< 0.1
Fensulfothion	DETSC 3443*	0.1	mg/kg		< 0.1
Bolstar	DETSC 3443*	0.1	mg/kg		< 0.1
Azinphos methyl	DETSC 3443*	0.1	mg/kg		< 0.1
Coumaphos	DETSC 3443*	0.1	mg/kg		< 0.1

Summary of Asbestos Analysis Soil Samples

Our Ref 16-70548

Client Ref N16055

Contract Title Whinney Hill Farm, Guide Post, Northumberland

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1010984	TP506 0.10	SOIL	NAD	none	Jeff Cruddas
1010985	TP512 0.10	SOIL	NAD	none	Jeff Cruddas

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Information in Support of the Analytical Results

Our Ref 16-70548
 Client Ref N16055
 Contract Whinney Hill Farm, Guide Post, Northumberland

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1010984	TP506 0.10 SOIL	20/06/16	GJ 250ml, GJ 60ml, PT 1L		
1010985	TP512 0.10 SOIL	20/06/16	GJ 250ml, GJ 60ml, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.
Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.
The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :- Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

Appendix D

Geotechnical Analysis Results



Laboratory Report



Contract Number: 31390

Client's Reference: **N16055/TD/1944**Report Date: **20-07-2016**

Client **Patrick Parsons Limited**
Waterloo House
Thornton Street
Newcastle upon Tyne
NE1 4AP

Contract Title: **Whinney Hill, Guide Post, Northumberland**
For the attention of: **Tobi Duchene**

Date Received: **21-06-2016**
Date Commenced: **21-06-2016**
Date Completed: **20-07-2016**

Test Description	Qty
Moisture Content 1377 : 1990 Part 2 : 3.2 - * UKAS	15
4 Point Liquid & Plastic Limit (LL/PL) 1377 : 1990 Part 2 : 4.3 & 5.3 - * UKAS	15
pH Value of Soil... 1377 : 1990 Part 3 : 9 - @ Non Accredited Test	15
Water Soluble Sulphate 2:1 extract 1377 : 1990 Part 3 : 5 - @ Non Accredited Test	15
Disposal of Samples on Project	1

Notes: Observations and Interpretations are outside the UKAS Accreditation
* - denotes test included in laboratory scope of accreditation
- denotes test carried out by approved contractor
@ - denotes non accredited tests

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved Signatories:

Alex Wynn (Associate Director) - Benjamin Sharp (Contracts Manager) - Emma Sharp (Office Manager)
Jon Tatam (Administrative/Quality Assistant) - Paul Evans (Quality/Technical Manager) - Vaughan Edwards (Managing Director)

Client ref: N16055
Location: Whinney Hill, Guide Post, Northumberland
Contract Number: 31390-060716

[illegible]

Note: Results on this table are in summary format and may not meet the requirements of the relevant standards, additional information is held by the laboratory



For and behalf of GEO Site & Testing Services Ltd

Authorised By:
Emma Sharp (Office Manager)

Date: 20.7.16

and



Test Report: Method of the Determination of the plastic limit and plasticity index
BS 1377 : Part 2 : 1990 Method 5

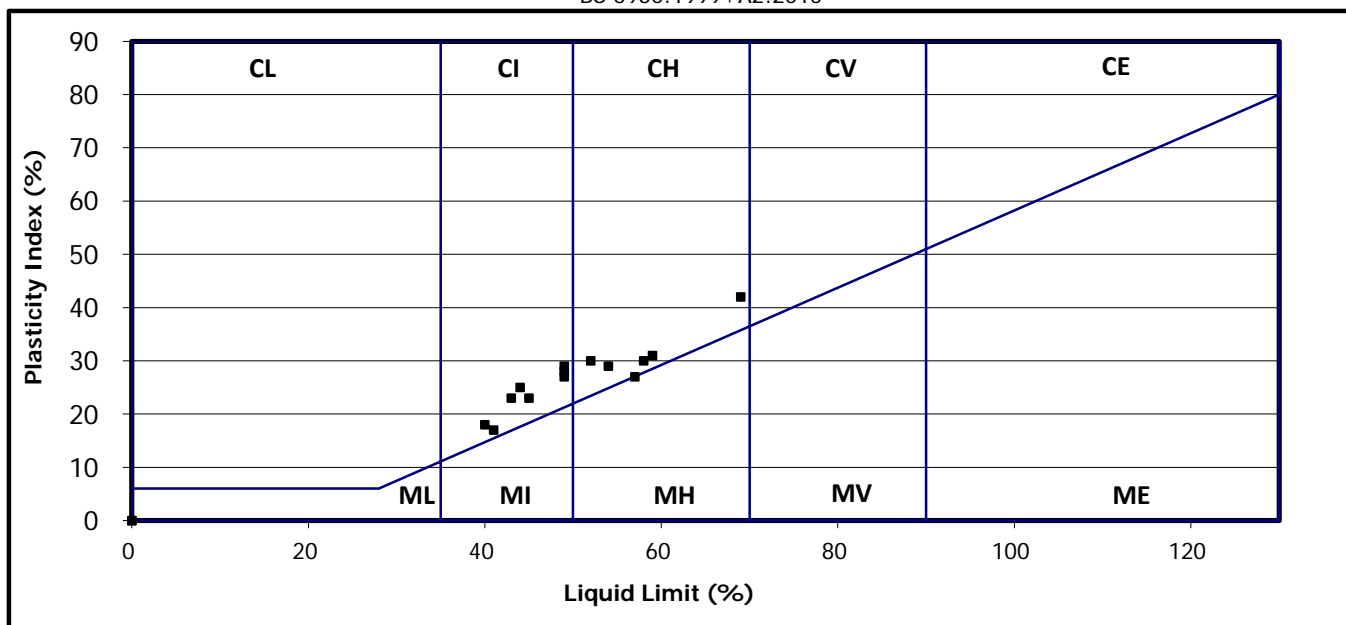
Client ref: N16055
Location: Whinney Hill, Guide Post, Northumberland
Contract Number: 31390-060716

Hole/ Sample Number	Sample Type	Depth m	Moisture Content % Cl. 3.2	Liquid Limit % Cl. 4.3/4.4	Plastic Limit % Cl. 5.	Plasticity Index % Cl. 6.	% Passing .425mm	Remarks
TP101	D	3.20	30	41	24	17	100	CI Intermediate Plasticity
TP102	D	2.50	32	43	20	23	100	CI Intermediate Plasticity
TP105	D	0.50	23	49	22	27	100	CI Intermediate Plasticity
TP105	D	1.85	30	44	19	25	100	CI Intermediate Plasticity
TP109	D	0.50	36	45	22	23	100	CI Intermediate Plasticity
TP112	D	2.75	25	40	22	18	100	CI Intermediate Plasticity
TP205	D	1.25	36	57	30	27	100	MH High Plasticity
TP206	D	3.40	30		NP		87	
TP213	D	1.00	29	59	28	31	100	CH High Plasticity
TP225	D	0.50	25	69	27	42	100	CH High Plasticity
TP226	D	0.60	28	58	28	30	100	CH High Plasticity
TP504	D	1.80	30	54	25	29	100	CH High Plasticity
TP506	D	1.75	31	52	22	30	100	CH High Plasticity
TP508	D	1.00	25	49	21	28	100	CI Intermediate Plasticity
TP512	D	1.70	28	49	20	29	100	CI Intermediate Plasticity

Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

BS 5930:1999+A2:2010





Unit 4
Heol Aur
Dafen Ind Estate
Dafen
Carmarthenshire
SA14 8QN
Tel: 01554 784040
01554 750752
Fax: 01554 770529
01554 784041
Web: www.geo.uk.com

Certificate of Analysis

Date: 15-07-16

Client: Patrick Parsons

Our Reference: 31390-060716

Client Reference: N16055

Contract Title: Whinney Hill, Guide Post, Northumberland

Description: (Total Samples) 15

Date Received: 06-07-16

Date Started: 13-07-16

Date Completed: 15-07-16

Test Procedures: (B.S. 1377 : PART 3 : 1990)

Notes:

Solid samples will be disposed 1 month and liquids 2 weeks

Approved By:

Authorised Signatories:

Emma Sharp
Laboratory Office Manager

Ben Sharp
Contracts Manager

Paul Evans
Quality Manager

Contract No: 31390-060716
Client Ref: N16055
Location: Whinney Hill, Guide Post, Northumberland
Date: 15-07-2016

SUMMARY OF CHEMICAL ANALYSIS

(B.S. 1377 : PART 3 : 1990)

[illegible]

NCP - No Chloride present

SOAKAWAY TEST - BRE DIGEST 365

PROJECT: Whinney Hill, Guide Post, Northumberland
JOB REF: N16055
DATE: 24/06/2016
TEST REF: TP114

Length of trial pit	=	L _{TP}	=	2.50	m
Width of trial pit	=	W _{TP}	=	0.66	m
Depth of trial pit	=	D	=	2.50	m
Pit Voids	=	PV	=	100	%

(Note - for open pits, PV = 100%. For stone filled pits, PV = 30%)

Water Depth at Start of Test, D _{TP}	=	1.500	m
75% Effective Depth, D ₇₅	=	1.525	m
50% Effective Depth, D ₅₀	=	1.550	m
25% Effective Depth, D ₂₅	=	1.575	m

Time from 75% to 25% effective depth, T _L	=	55	mins
--	---	----	------

Volume of water escaping during this test between D₇₅ and D₂₅

$$= V_{tp75-25}$$

$$= (L_{TP} \times W_{TP} \times (D_{25} - D_{75}) \times PV) = 0.083 \text{ m}^3$$

Mean surface area through which the above volume escapes, is the wetted area.

Only 50% of the effective depth is allowed in the calculation:

Hence:

$$A_{P50} = \text{Wet Base Area} + \text{Wet Sides Area (from } D_{50} \text{ to base of pit)}$$

$$A_{P50} = (L_{TP} \times W_{TP}) + (2L_{TP} + 2W_{TP}) \times (D - D_{50})$$

$$A_{P50} = 1.65 + 6.004$$

$$A_{P50} = 7.65 \text{ m}^2$$

Soil Infiltration Rate	=	f	=	$\frac{V_{TP75-25}}{A_{P50} \times 60 \times T_L}$	m/s
------------------------	---	---	---	--	-----

		f		$\frac{0.08}{7.65 \times 60 \times 55}$	m/s
--	--	---	--	---	-----

Soil Infiltration Rate	f	=	3.27E-06	m/s
------------------------	---	---	----------	-----

[illegible]

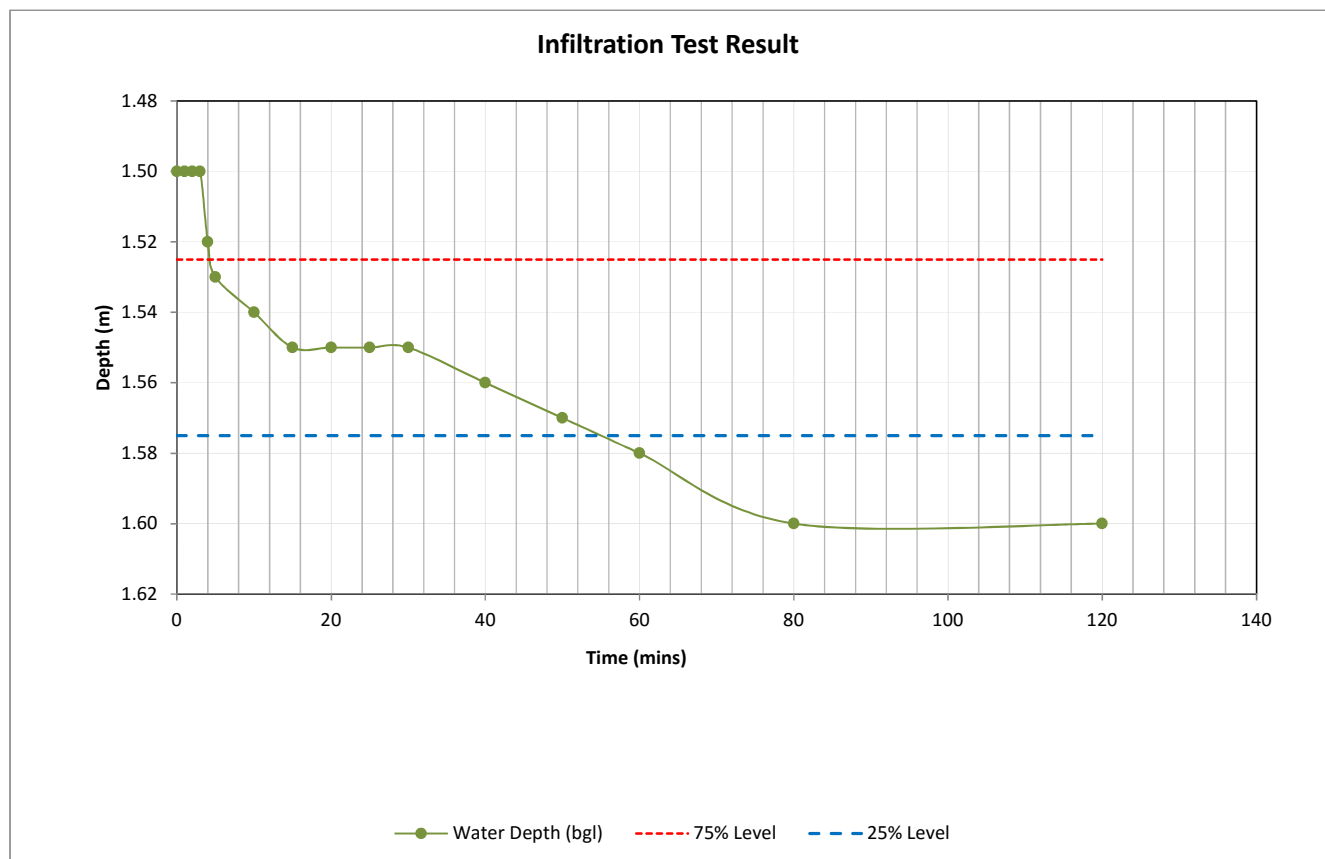
Trial Pit Depth	2.50
Total Fall in Water Level(m):	0.10
Water Depth at Start of Test (m):	1.50
Water Depth at End of Test (m):	1.60
Theoretical 25% Effective Depth (assuming complete drainage):	2.25

As water drop did not reach 25% Effective Depth during the test, the calculated outflow volume from 75% and 25% will be based on the total water level drop from 1.5m to 1.6m

OUTFLOW VOLUME

75% Level (m)	1.525
25% Level (m)	1.575
Effective Range 75% - 25% (m)	0.050

Time to fall to 75% Depth (mins)	5
Time to fall to 25% Depth (mins)	60
Time from 75% to 25% Depth (mins)	55



SOAKAWAY TEST - BRE DIGEST 365

PROJECT: Whinney Hill, Guide Post, Northumberland
JOB REF: N16055
DATE: 24/06/2016
TEST REF: TP227

Length of trial pit	=	L_{TP}	=	2.50	m
Width of trial pit	=	W_{TP}	=	0.66	m
Depth of trial pit	=	D	=	3.00	m
Pit Voids	=	PV	=	100	%

(Note - for open pits, $PV = 100\%$. For stone filled pits, $PV = 30\%$)

Water Depth at Start of Test, D_{TP}	=	2.200	m
75% Effective Depth, D_{75}	=	2.205	m
50% Effective Depth, D_{50}	=	2.210	m
25% Effective Depth, D_{25}	=	2.215	m

Time from 75% to 25% effective depth, T_L = 5 mins

Volume of water escaping during this test between D_{75} and D_{25}

$$= V_{tp75-25}$$

$$= (L_{TP} \times W_{TP} \times (D_{25} - D_{75}) \times PV) = 0.016 \text{ m}^3$$

Mean surface area through which the above volume escapes, is the wetted area.

Only 50% of the effective depth is allowed in the calculation:

Hence:

$$A_{P50} = \text{Wet Base Area} + \text{Wet Sides Area (from } D_{50} \text{ to base of pit)}$$

$$A_{P50} = (L_{TP} \times W_{TP}) + (2L_{TP} + 2W_{TP}) \times (D - D_{50})$$

$$A_{P50} = 1.65 + 4.993$$

$$A_{P50} = 6.64 \text{ m}^2$$

$$\text{Soil Infiltration Rate} = f = \frac{V_{TP75-25}}{A_{P50} \times 60 \times T_L} \text{ m/s}$$

$$f = \frac{0.02}{6.64 \times 60 \times 5} \text{ m/s}$$

$$\text{Soil Infiltration Rate } f = 8.28\text{E-}06 \text{ m/s}$$

[illegible]

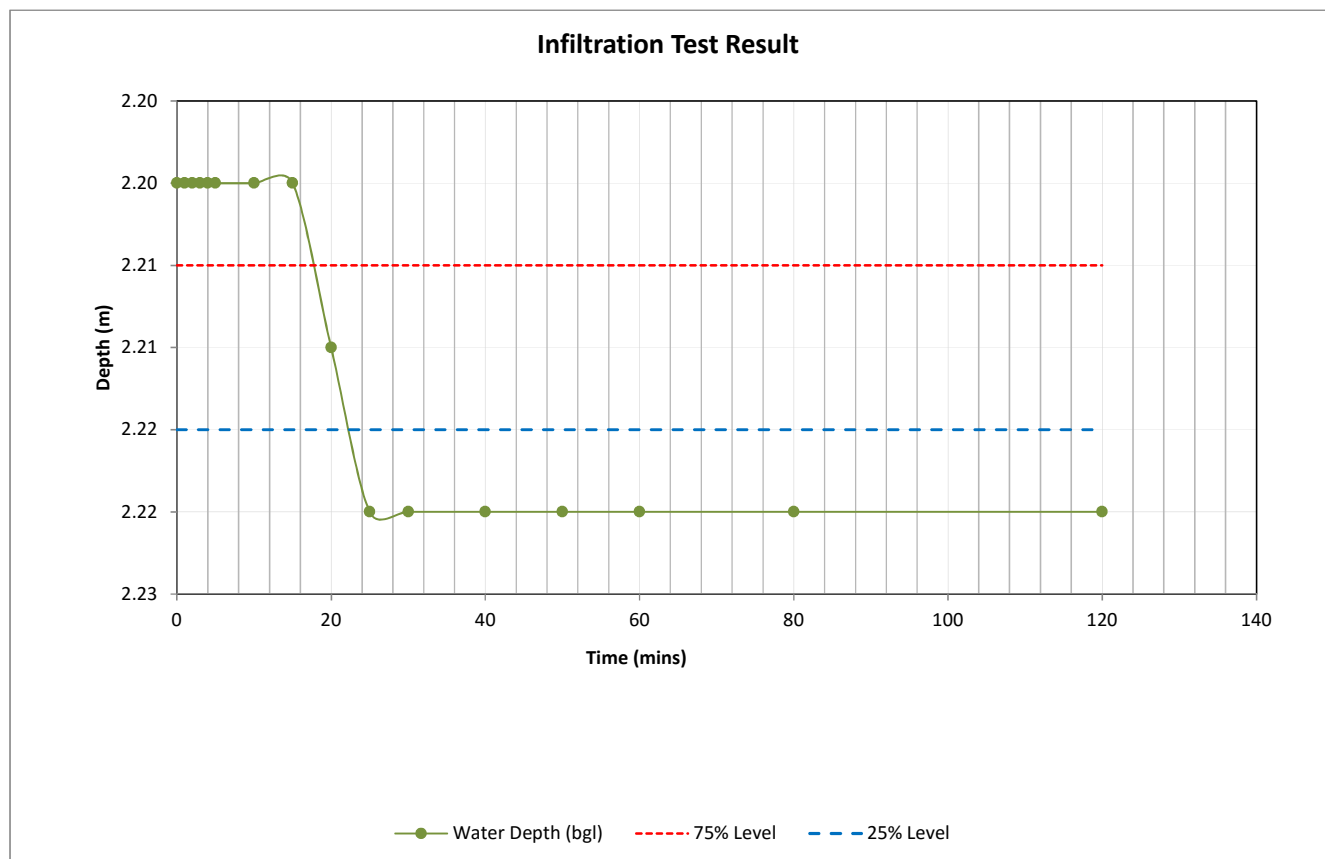
Trial Pit Depth	3.00
Total Fall in Water Level(m):	0.02
Water Depth at Start of Test (m):	2.20
Water Depth at End of Test (m):	2.22
Theoretical 25% Effective Depth (assuming complete drainage):	2.80

As water drop did not reach 25% Effective Depth during the test, the calculated outflow volume from 75% and 25% will be based on the total water level drop from 2.2m to 2.22m

OUTFLOW VOLUME

75% Level (m)	2.205
25% Level (m)	2.215
Effective Range 75% - 25% (m)	0.010

Time to fall to 75% Depth (mins)	20
Time to fall to 25% Depth (mins)	25
Time from 75% to 25% Depth (mins)	5



SOAKAWAY TEST - BRE DIGEST 365

PROJECT: Whinney Hill, Guide Post, Northumberland
JOB REF: N16055
DATE: 24/06/2016
TEST REF: TP228

Length of trial pit	=	L_{TP}	=	2.50	m
Width of trial pit	=	W_{TP}	=	0.66	m
Depth of trial pit	=	D	=	3.00	m
Pit Voids	=	PV	=	100	%

(Note - for open pits, $PV = 100\%$. For stone filled pits, $PV = 30\%$)

Water Depth at Start of Test, D_{TP}	=	2.000	m
75% Effective Depth, D_{75}	=	2.008	m
50% Effective Depth, D_{50}	=	2.016	m
25% Effective Depth, D_{25}	=	2.023	m

Time from 75% to 25% effective depth, T_L = 35 mins

Volume of water escaping during this test between D_{75} and D_{25}

$$= V_{tp75-25}$$

$$= (L_{TP} \times W_{TP} \times (D_{25} - D_{75}) \times PV) = 0.025 \text{ m}^3$$

Mean surface area through which the above volume escapes, is the wetted area.

Only 50% of the effective depth is allowed in the calculation:

Hence:

$$A_{P50} = \text{Wet Base Area} + \text{Wet Sides Area (from } D_{50} \text{ to base of pit)}$$

$$A_{P50} = (L_{TP} \times W_{TP}) + (2L_{TP} + 2W_{TP}) \times (D - D_{50})$$

$$A_{P50} = 1.65 + 6.222$$

$$A_{P50} = 7.87 \text{ m}^2$$

$$\text{Soil Infiltration Rate} = f = \frac{V_{TP75-25}}{A_{P50} \times 60 \times T_L} \text{ m/s}$$

$$f = \frac{0.02}{7.87 \times 60 \times 35} \text{ m/s}$$

$$\text{Soil Infiltration Rate } f = 1.50E-06 \text{ m/s}$$

[illegible]

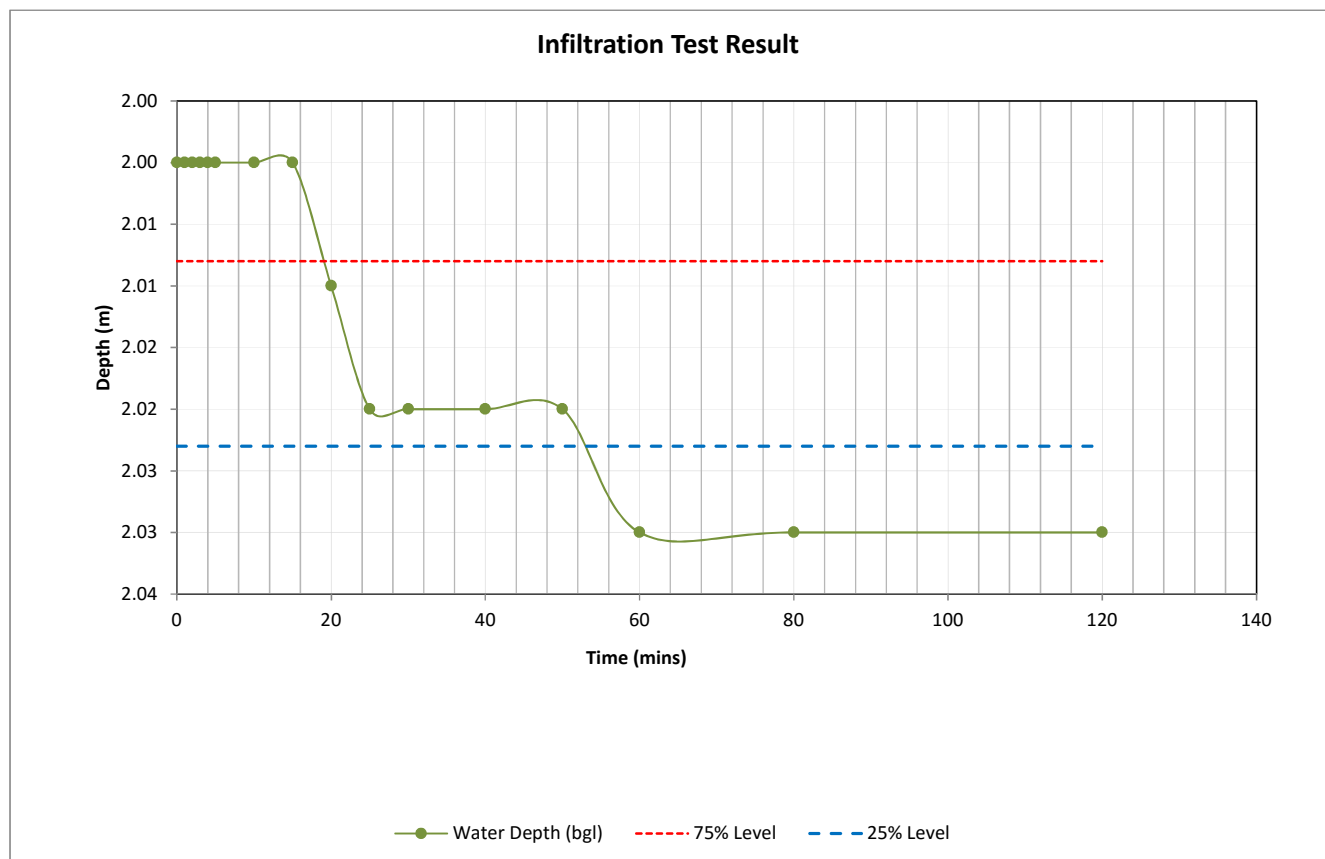
Trial Pit Depth	3.00
Total Fall in Water Level(m):	0.03
Water Depth at Start of Test (m):	2.00
Water Depth at End of Test (m):	2.03
Theoretical 25% Effective Depth (assuming complete drainage):	2.75

As water drop did not reach 25% Effective Depth during the test, the calculated outflow volume from 75% and 25% will be based on the total water level drop from 2m to 2.03m

OUTFLOW VOLUME

75% Level (m)	2.008
25% Level (m)	2.023
Effective Range 75% - 25% (m)	0.015

Time to fall to 75% Depth (mins)	25
Time to fall to 25% Depth (mins)	60
Time from 75% to 25% Depth (mins)	35



SOAKAWAY TEST - BRE DIGEST 365

PROJECT: Whinney Hill, Guide Post, Northumberland
JOB REF: N16055
DATE: 23/06/2016
TEST REF: TP303

Length of trial pit	=	L _{TP}	=	2.50	m
Width of trial pit	=	W _{TP}	=	0.66	m
Depth of trial pit	=	D	=	3.00	m
Pit Voids	=	PV	=	100	%

(Note - for open pits, PV = 100%. For stone filled pits, PV = 30%)

Water Depth at Start of Test, D _{TP}	=	2.000	m
75% Effective Depth, D ₇₅	=	2.050	m
50% Effective Depth, D ₅₀	=	2.100	m
25% Effective Depth, D ₂₅	=	2.150	m

Time from 75% to 25% effective depth, T _L	=	5	mins
--	---	---	------

Volume of water escaping during this test between D₇₅ and D₂₅

$$= V_{tp75-25}$$

$$= (L_{TP} \times W_{TP} \times (D_{25} - D_{75}) \times PV) = 0.165 \text{ m}^3$$

Mean surface area through which the above volume escapes, is the wetted area.

Only 50% of the effective depth is allowed in the calculation:

Hence:

$$A_{P50} = \text{Wet Base Area} + \text{Wet Sides Area (from } D_{50} \text{ to base of pit)}$$

$$A_{P50} = (L_{TP} \times W_{TP}) + (2L_{TP} + 2W_{TP}) \times (D - D_{50})$$

$$A_{P50} = 1.65 + 5.688$$

$$A_{P50} = 7.34 \text{ m}^2$$

Soil Infiltration Rate	=	f	=	$\frac{V_{TP75-25}}{A_{P50} \times 60 \times T_L}$	m/s
------------------------	---	---	---	--	-----

		f		$\frac{0.17}{7.34 \times 60 \times 5}$	m/s
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Soil Infiltration Rate	f	=	7.49E-05	m/s
------------------------	---	---	----------	-----

[illegible]

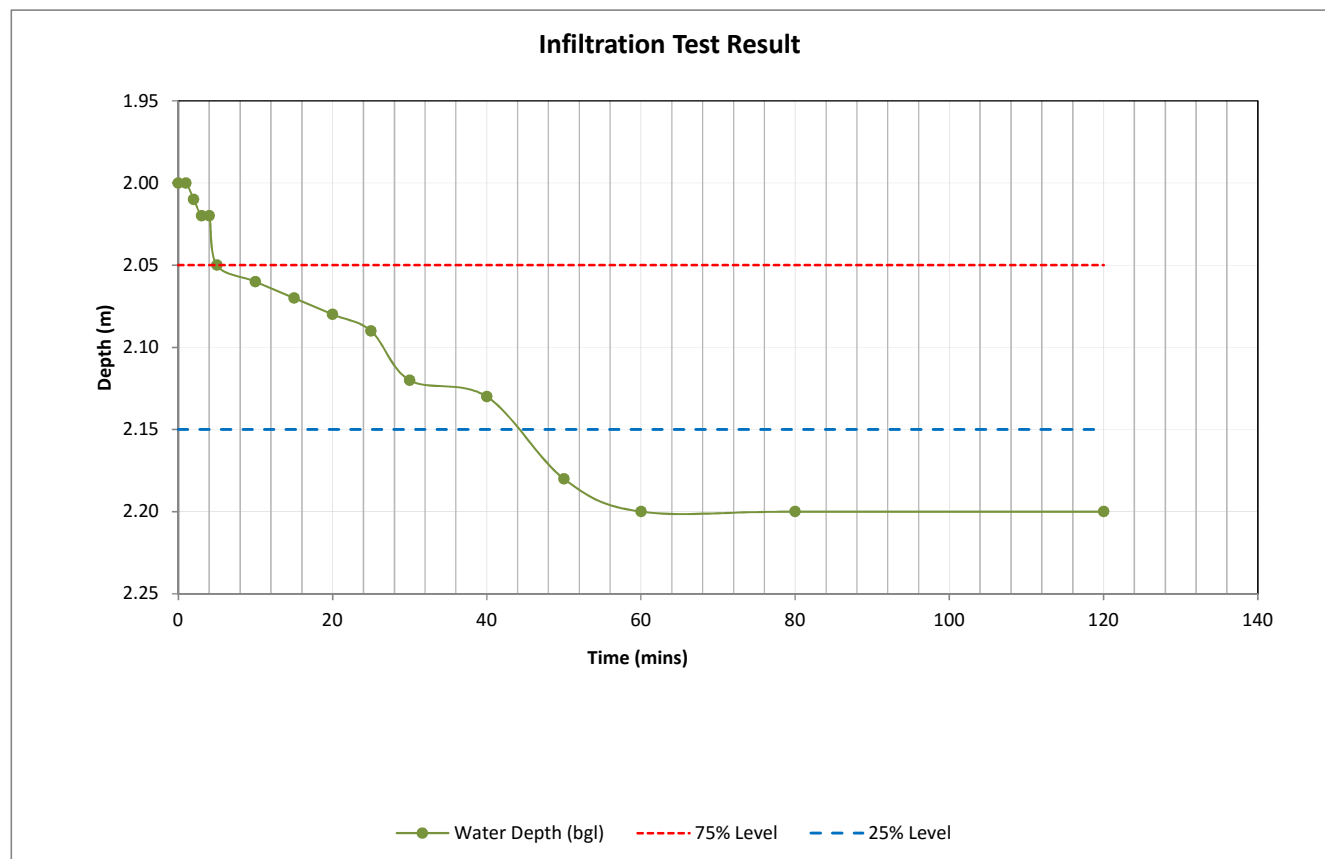
Trial Pit Depth	3.00
Total Fall in Water Level(m):	0.20
Water Depth at Start of Test (m):	2.00
Water Depth at End of Test (m):	2.20
Theoretical 25% Effective Depth (assuming complete drainage):	2.75

As water drop did not reach 25% Effective Depth during the test, the calculated outflow volume from 75% and 25% will be based on the total water level drop from 2m to 2.2m

OUTFLOW VOLUME

75% Level (m)	2.050
25% Level (m)	2.150
Effective Range 75% - 25% (m)	0.100

Time to fall to 75% Depth (mins)	30
Time to fall to 25% Depth (mins)	35
Time from 75% to 25% Depth (mins)	5



SOAKAWAY TEST - BRE DIGEST 365

PROJECT: Whinney Hill, Guide Post, Northumberland
JOB REF: N16055
DATE: 23/06/2016
TEST REF: TP403

Length of trial pit	=	L_{TP}	=	2.50	m
Width of trial pit	=	W_{TP}	=	0.66	m
Depth of trial pit	=	D	=	3.00	m
Pit Voids	=	PV	=	100	%

(Note - for open pits, $PV = 100\%$. For stone filled pits, $PV = 30\%$)

Water Depth at Start of Test, D_{TP}	=	2.000	m
75% Effective Depth, D_{75}	=	2.015	m
50% Effective Depth, D_{50}	=	2.030	m
25% Effective Depth, D_{25}	=	2.045	m

Time from 75% to 25% effective depth, T_L	=	46	mins
---	---	----	------

Volume of water escaping during this test between D_{75} and D_{25}

$$= V_{tp75-25}$$

$$= (L_{TP} \times W_{TP} \times (D_{25} - D_{75}) \times PV) = 0.049 \text{ m}^3$$

Mean surface area through which the above volume escapes, is the wetted area.

Only 50% of the effective depth is allowed in the calculation:

Hence:

$$A_{P50} = \text{Wet Base Area} + \text{Wet Sides Area (from } D_{50} \text{ to base of pit)}$$

$$A_{P50} = (L_{TP} \times W_{TP}) + (2L_{TP} + 2W_{TP}) \times (D - D_{50})$$

$$A_{P50} = 1.65 + 6.130$$

$$A_{P50} = 7.78 \text{ m}^2$$

Soil Infiltration Rate	=	f	=	$\frac{V_{TP75-25}}{A_{P50} \times 60 \times T_L}$	m/s
------------------------	---	-----	---	--	-----

f	=	$\frac{0.05}{7.78 \times 60 \times 46}$	m/s
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Soil Infiltration Rate	f	=	2.31E-06	m/s
------------------------	-----	---	----------	-----

[illegible]

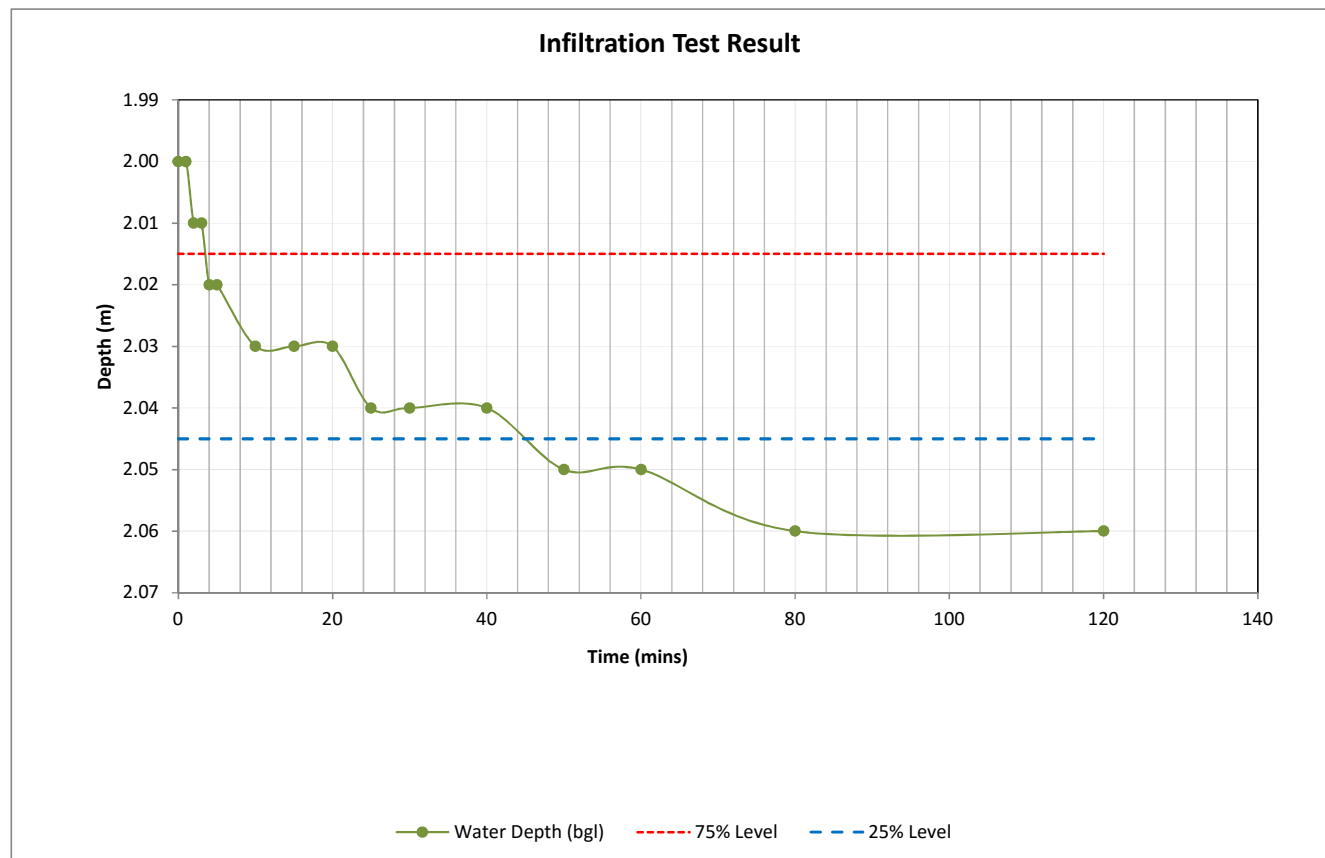
Trial Pit Depth	3.00
Total Fall in Water Level(m):	0.06
Water Depth at Start of Test (m):	2.00
Water Depth at End of Test (m):	2.06
Theoretical 25% Effective Depth (assuming complete drainage):	2.75

As water drop did not reach 25% Effective Depth during the test, the calculated outflow volume from 75% and 25% will be based on the total water level drop from 2m to 2.06m

OUTFLOW VOLUME

75% Level (m)	2.015
25% Level (m)	2.045
Effective Range 75% - 25% (m)	0.030

Time to fall to 75% Depth (mins)	4
Time to fall to 25% Depth (mins)	50
Time from 75% to 25% Depth (mins)	46



SOAKAWAY TEST - BRE DIGEST 365

PROJECT: Whinney Hill, Guide Post, Northumberland
JOB REF: N16055
DATE: 24/06/2016
TEST REF: TP501

Length of trial pit	=	L_{TP}	=	2.50	m
Width of trial pit	=	W_{TP}	=	0.66	m
Depth of trial pit	=	D	=	3.00	m
Pit Voids	=	PV	=	100	%

(Note - for open pits, $PV = 100\%$. For stone filled pits, $PV = 30\%$)

Water Depth at Start of Test, D_{TP}	=	2.000	m
75% Effective Depth, D_{75}	=	2.005	m
50% Effective Depth, D_{50}	=	2.010	m
25% Effective Depth, D_{25}	=	2.015	m

Time from 75% to 25% effective depth, T_L = 2 mins

Volume of water escaping during this test between D_{75} and D_{25}

$$= V_{tp75-25}$$

$$= (L_{TP} \times W_{TP} \times (D_{25} - D_{75}) \times PV) = 0.017 \text{ m}^3$$

Mean surface area through which the above volume escapes, is the wetted area.

Only 50% of the effective depth is allowed in the calculation:

Hence:

$$A_{P50} = \text{Wet Base Area} + \text{Wet Sides Area (from } D_{50} \text{ to base of pit)}$$

$$A_{P50} = (L_{TP} \times W_{TP}) + (2L_{TP} + 2W_{TP}) \times (D - D_{50})$$

$$A_{P50} = 1.65 + 6.257$$

$$A_{P50} = 7.91 \text{ m}^2$$

$$\text{Soil Infiltration Rate} = f = \frac{V_{TP75-25}}{A_{P50} \times 60 \times T_L} \text{ m/s}$$

$$f = \frac{0.02}{7.91 \times 60 \times 2} \text{ m/s}$$

$$\text{Soil Infiltration Rate } f = 1.74E-05 \text{ m/s}$$

[illegible]

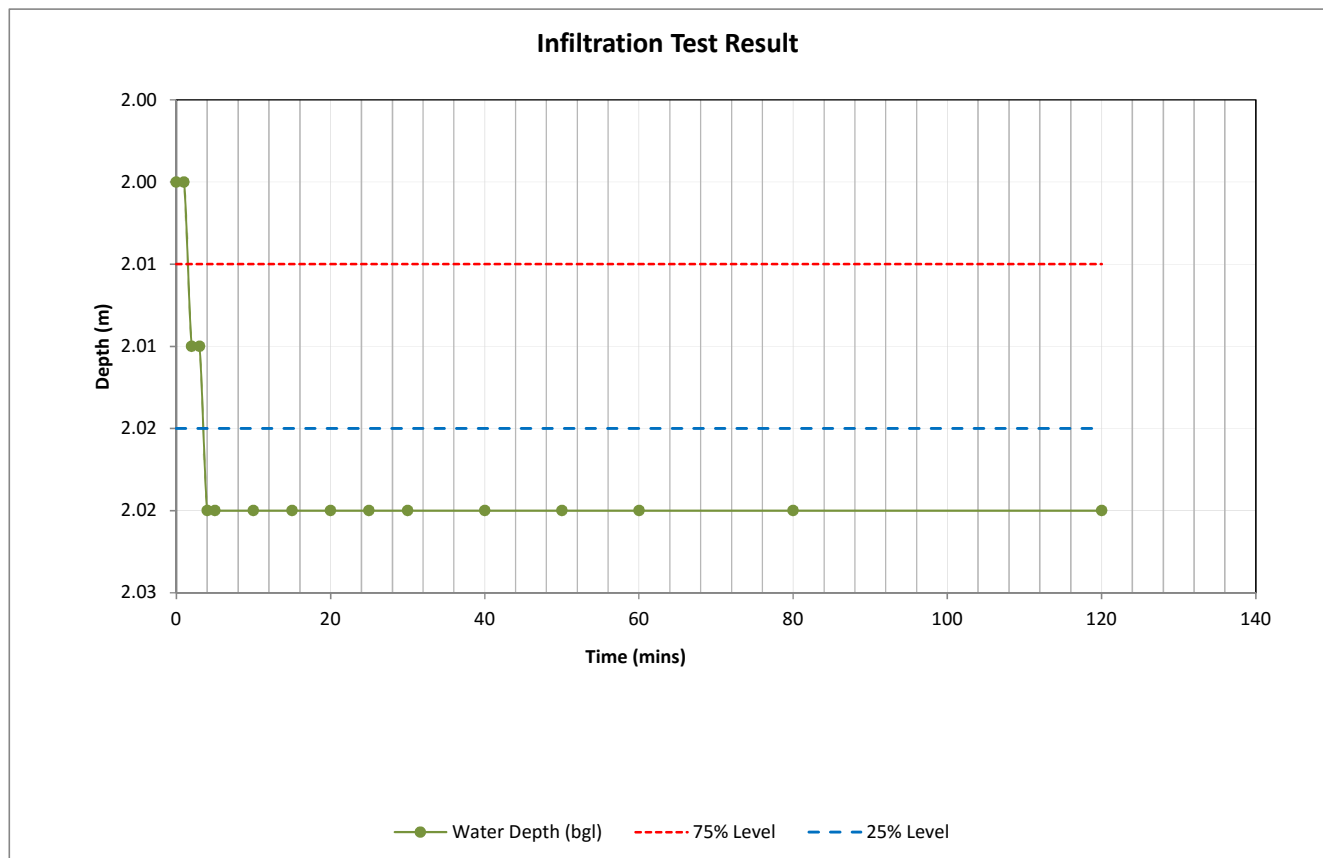
Trial Pit Depth	3.00
Total Fall in Water Level(m):	0.02
Water Depth at Start of Test (m):	2.00
Water Depth at End of Test (m):	2.02
Theoretical 25% Effective Depth (assuming complete drainage):	2.75

As water drop did not reach 25% Effective Depth during the test, the calculated outflow volume from 75% and 25% will be based on the total water level drop from 2m to 2.02m

OUTFLOW VOLUME

75% Level (m)	2.005
25% Level (m)	2.015
Effective Range 75% - 25% (m)	0.010

Time to fall to 75% Depth (mins)	2
Time to fall to 25% Depth (mins)	4
Time from 75% to 25% Depth (mins)	2



SOAKAWAY TEST - BRE DIGEST 365

PROJECT: Whinney Hill, Guide Post, Northumberland
JOB REF: N16055
DATE: 24/06/2016
TEST REF: TP513

Length of trial pit	=	L_{TP}	=	2.50	m
Width of trial pit	=	W_{TP}	=	0.66	m
Depth of trial pit	=	D	=	1.90	m
Pit Voids	=	PV	=	100	%

(Note - for open pits, $PV = 100\%$. For stone filled pits, $PV = 30\%$)

Water Depth at Start of Test, D_{TP}	=	1.000	m
75% Effective Depth, D_{75}	=	1.008	m
50% Effective Depth, D_{50}	=	1.016	m
25% Effective Depth, D_{25}	=	1.023	m

Time from 75% to 25% effective depth, T_L = 6 mins

Volume of water escaping during this test between D_{75} and D_{25}

$$= V_{tp75-25}$$

$$= (L_{TP} \times W_{TP} \times (D_{25} - D_{75}) \times PV) = 0.025 \text{ m}^3$$

Mean surface area through which the above volume escapes, is the wetted area.

Only 50% of the effective depth is allowed in the calculation:

Hence:

$$A_{P50} = \text{Wet Base Area} + \text{Wet Sides Area (from } D_{50} \text{ to base of pit)}$$

$$A_{P50} = (L_{TP} \times W_{TP}) + (2L_{TP} + 2W_{TP}) \times (D - D_{50})$$

$$A_{P50} = 1.65 + 5.590$$

$$A_{P50} = 7.24 \text{ m}^2$$

$$\text{Soil Infiltration Rate} = f = \frac{V_{TP75-25}}{A_{P50} \times 60 \times T_L} \text{ m/s}$$

$$f = \frac{0.02}{7.24 \times 60 \times 6} \text{ m/s}$$

$$\text{Soil Infiltration Rate } f = 9.50E-06 \text{ m/s}$$

[illegible]

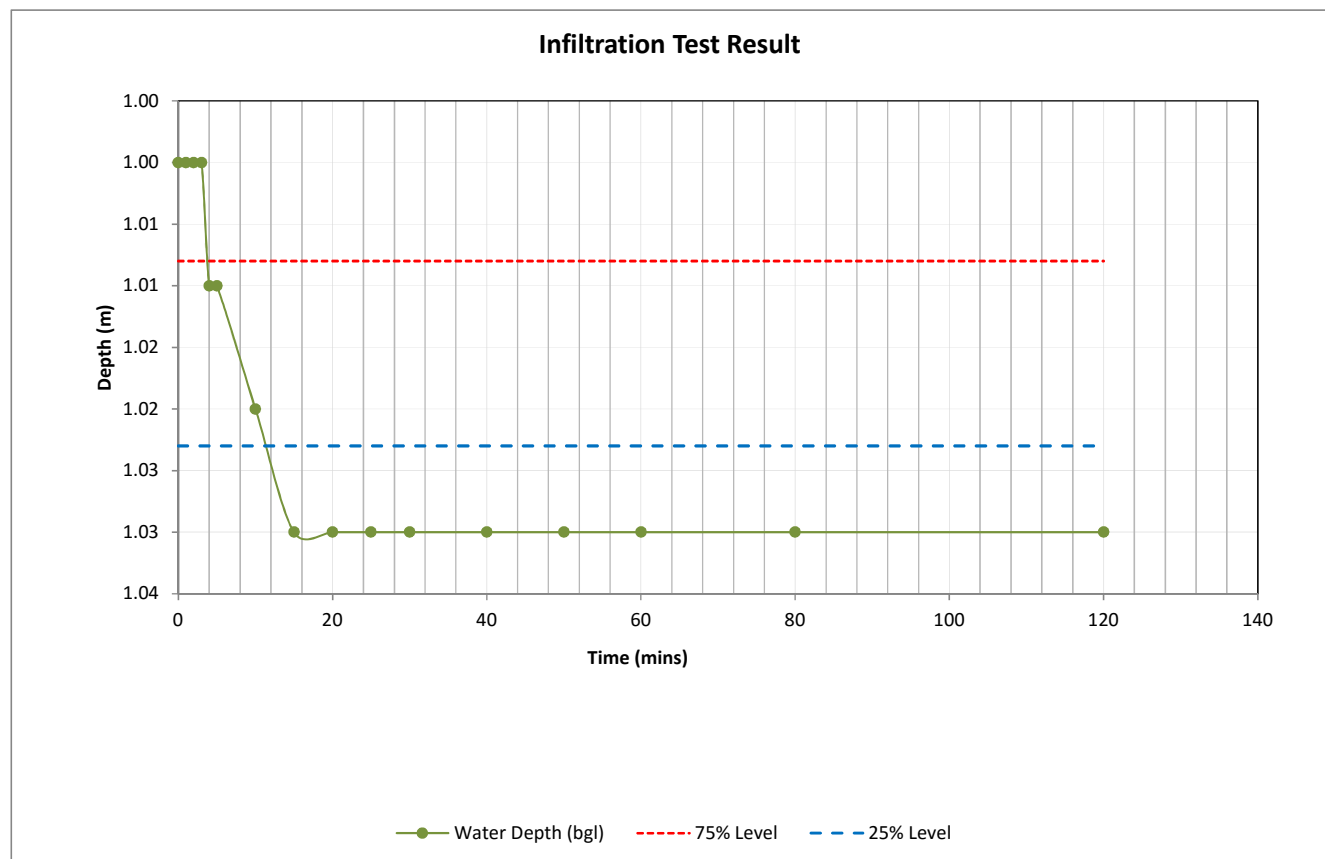
Trial Pit Depth	1.90
Total Fall in Water Level(m):	0.03
Water Depth at Start of Test (m):	1.00
Water Depth at End of Test (m):	1.03
Theoretical 25% Effective Depth (assuming complete drainage):	1.68

As water drop did not reach 25% Effective Depth during the test, the calculated outflow volume from 75% and 25% will be based on the total water level drop from 1m to 1.03m

OUTFLOW VOLUME

75% Level (m)	1.008
25% Level (m)	1.023
Effective Range 75% - 25% (m)	0.015

Time to fall to 75% Depth (mins)	4
Time to fall to 25% Depth (mins)	10
Time from 75% to 25% Depth (mins)	6



Appendix E

Gas and Water Monitoring Results

Ground Gas and Groundwater Monitoring Record Sheet

JOB DETAILS:

Client:
Site: Whinney Hill, Guide Post
Date: 05/07/2016

Job No: N16055
Visit No: 1 of 6
Operator: MW

Project Manager: SHJ

	GAS CONCENTRATIONS												VOCs		GAS FLOWS				WELL AND GROUNDWATER DATA					Comments
Monitoring Point	Methane [%v/v]		LEL [%]		Carbon dioxide [%v/v]		Carbon monoxide [ppm]		Hydrogen sulphide [ppm]		Oxygen [%v/v]		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Water level (mbgl)	Depth of well (m)	Reduced level (mAOD)	Water level (mAOD)	Response Zone	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady			Peak	Steady								
WS101	13.9	13.9			10.7	10.7	3.0	3.0	0.0	0.0	0.2	0.2			0.0	0.0			1.3	2.9				
WS102	0.0	0.0			5.9	5.9	0.0	0.0	0.0	0.0	12.4	12.4			0.0	0.0			1.3	3.0				
WS104	0.0	0.0			2.8	2.8	0.0	0.0	0.0	0.0	18.2	18.2			0.0	0.0			1.2	2.6				
WS202	0.0	0.0			3.3	3.3	0.0	0.0	0.0	0.0	20.2	20.2			0.0	0.0			1.6	2.8				
WS401	0	0			3.7	3.7	0	0	0	0	16.6	16.6			0	0			1.58	2.78				
WS403	0	0			3.1	3.1	0	0	0	0	17.7	17.7			0	0			1.47	2.38				
Max	13.9	13.9	0.0	0.0	10.7	10.7	3.0	3.0	0.0	0.0	20.2	20.2	0.0	0.0	0.0	0.0	0.0	0.0	1.6	3.0	0.0	0.0		
Min	0.0	0.0	0.0	0.0	2.8	2.8	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.2	2.4	0.0	0.0		
GSV (l/hr)	0.0				0																			

METEOROLOGICAL AND SITE INFORMATION:

State of ground:

☒ Dry

Wind:

☒ Calm

Cloud cover:

☐ None

Precipitation:

☒ None

Barometric pressure (mbar):

Pressure trend:

Air Temperature (Deg. C):

(Select correct box with X or enter data, as applicable)

☐ Moist

☒ Light

☐ Slight

☐ Slight

1012 Before

☐ Falling

☐ Before

☐ Wet

☐ Moderate

☒ Cloudy

☐ Moderate

☐ Steady

☐ Snow

☐ Strong

☐ Overcast

☐ Heavy

1012 After

☐ Rising

☐ After

☐ Frozen

Ground Gas and Groundwater Monitoring Record

JOB DETAILS:

Client:
Site: Whinney Hill, Guide Post
Date: 25/07/2016

Job No: N16055
Visit No: 2 of 6
Operator: MW **Project Manager:** SHJ

	GAS CONCENTRATIONS												VOCs		GAS FLOWS				WELL AND GROUNDWATER DATA					Comments
Monitoring Point	Methane (%v/v)		%LEL		Carbon dioxide (%v/v)		Carbon monoxide (%v/v)		Hydrogen sulphide (%v/v)		Oxygen (%v/v)		PID Peak (ppm)	Product thickness (mm)	Flow rate (l/hr)		Differential borehole Pressure (Pa)	Time for flow to equalise (secs)	Water level (mbgl)	Depth of well (m)	Reduced level (mAOD)	Water level (mAOD)	Response Zone	
	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady			Peak	Steady								
WS101	16.5	16.5			12.9	12.9	0.0	0.0	0.0	0.0	1.3	1.3			0.0	0.0			1.61	2.9				
WS102	0.0	0.0			4.2	4.2	0.0	0.0	0.0	0.0	17.2	17.2			0.0	0.0			1.28	3.0				
WS104	0.0	0.0			0.5	0.4	2.0	2.0	0.0	0.0	19.8	19.8			0.2	0.2			1.02	2.6				
WS202	0.0	0.0			3.4	3.4	0.0	0.0	0.0	0.0	18.4	18.4			0.0	0.0			1.44	2.8				
WS401	0	0			4.2	4.2	2	0	0	0	17.6	17.6			0	0			1.63	2.78				
WS403	0	0			3.5	3.5	0	0	0	0	18.1	18.1			0	0			1.44	2.38				
Max	16.5	16.5	0	0	12.9	12.9	2	2	0	0	19.8	18.4	0	0	0.2	0.2	0	0	1.63	2.96	0	0.00		
Min	0	0	0	0	0.5	0.4	0	0	0	0	1.3	1.3	0	0	0	0	0	0	1.02	2.38	0	0.00		
GSV (l/hr)	0.033				0.0258																			

METEOROLOGICAL AND SITE INFORMATION:

State of ground: ☒ Dry ☐ Moist ☐ Wet ☐ Snow ☐ Frozen
 Wind: ☐ Calm ☐ Light ☒ Moderate ☐ Strong
 Cloud cover: ☐ None ☒ Slight ☒ Cloudy ☐ Overcast
 Precipitation: ☒ None ☐ Slight ☐ Moderate ☐ Heavy
 Barometric pressure (mbar): ☐ 1010 Before ☐ 1012 After
 Pressure trend: ☐ Falling ☐ Steady ☒ Rising
 Air Temperature (Deg. C): ☐ Before ☐ After

Appendix F

Summary of Chemical Results

Parameter	No. of samples tested	Range of results	GAC (6.0% SOM) ³	No. of samples exceeding GAC
Metals, Metalloids, Non-metals				
Arsenic	15	4.70 - 12.00	37.00	0
Cadmium	15	<0.10 - 1.00	11.00	0
Chromium III	15	11.00 - 28.00	910.00	0
Chromium VI	15	<1.00 - 1.00	6.00	0
Copper	15	10.00 - 52.00	2400.00	0
Lead ⁴	15	25.00 - 270.00	200.00	1
Mercury, Inorganic	15	<0.05 - 0.18	40.00	0
Nickel	15	10.00 - 26.00	130.00	0
Selenium	15	<0.50 - 0.60	250.00	0
Zinc	15	47.00 - 320.00	3700.00	0
Inorganics				
pH	15	6.30 - 8.00		
Total Organic Carbon	15	1.50 - 5.40		
Sulphate Aqueous Extract as SO ₄	15	<10.00 - 49.00		
Total Sulphate as SO ₄	15	0.03 - 0.12		
Petroleum Hydrocarbons				
Aliphatic C5-C6	6	<0.01 - 0.01	160.00	0
Aliphatic C6-C8	6	<0.01 - 0.01	530.00	0
Aliphatic C8-C10	6	<0.01 - 0.01	150.00	0
Aliphatic C10-C12	6	<1.50 - 1.50	760.00	0
Aliphatic C12-C16	6	<1.20 - 1.20	4300.00	0
Aliphatic C16-C21	6	<1.50 - 1.50	110000.00	0
Aliphatic C21-C35	6	<3.40 - 3.40	110000.00	0
Aromatic C5-C7	6	<0.01 - 0.01	300.00	0
Aromatic C7-C8	6	<0.01 - 0.01	660.00	0
Aromatic C8-C10	6	<0.01 - 0.01	190.00	0
Aromatic C10-C12	6	<0.90 - 0.90	380.00	0
Aromatic C12-C16	6	<0.50 - 0.50	660.00	0
Aromatic C16-C21	6	<0.60 - 8.20	930.00	0
Aromatic C21-C35	6	<1.40 - 37.00	1700.00	0
Polycyclic aromatic hydrocarbons				
Acenaphthene	15	<0.10 - 1.30	1100.00	0
Acenaphthylene	15	<0.10 - 0.50	920.00	0
Anthracene	15	<0.10 - 3.90	11000.00	0
Benzo(a)anthracene	15	<0.10 - 10.00	13.00	0
Benzo(a)pyrene	15	<0.10 - 8.80	3.00	1
Benzo(b)fluoranthene	15	<0.10 - 7.20	3.70	1
Benzo(g,h,i)perylene	15	<0.10 - 5.30	350.00	0
Benzo(k)fluoranthene	15	<0.10 - 4.20	100.00	0
Chrysene	15	<0.10 - 9.70	27.00	0
Dibenzo(a,h)anthracene	15	<0.10 - 1.60	0.30	1
Fluoranthene	15	<0.10 - 22.00	890.00	0
Fluorene	15	<0.10 - 2.10	860.00	0
Indeno(1,2,3-c,d)pyrene	15	<0.10 - 5.90	41.00	0
Naphthalene	15	<0.10 - 0.20	13.00	0
Phenanthrene	15	<0.10 - 15.00	440.00	0
Pyrene	15	<0.10 - 16.00	2000.00	0
Organochlorine pesticides				
alpha-BHC	3	<0.10 - 0.10		0
gamma-BHC (Lindane)	3	<0.10 - 0.10		0
beta-BHC	3	<0.10 - 0.10		0
delta-BHC	3	<0.10 - 0.10		0
Heptachlor	3	<0.10 - 0.10		0
Aldrin	3	<0.10 - 0.10		0
Heptachlor epoxide	3	<0.10 - 0.10		0
gamma-Chlordane	3	<0.10 - 0.10		0
Endosulphan I & Alpha-chlorodane	3	<0.10 - 0.10		0
4,4-DDE	3	<0.10 - 0.10		0
Dieldrin	3	<0.10 - 0.10		0
Endrin	3	<0.10 - 0.10		0

Endosulphan II & 4,4-DDD	3	<0.10 - 0.10	0
Endrin aldehyde	3	<0.10 - 0.10	0
4,4-DDT	3	<0.10 - 0.10	0
Endosulphan sulphate	3	<0.10 - 0.10	0
Methoxychlor	3	<0.10 - 0.10	0
Endrin ketone	3	<0.10 - 0.10	0
Organophosphorus pesticides			
Dichlorvos	3	<0.10 - 0.10	0
Mevinphos	3	<0.10 - 0.10	0
Demeton-O	3	<0.10 - 0.10	0
Ethoprop	3	<0.10 - 0.10	0
Naled	3	<0.10 - 0.10	0
Phorate	3	<0.10 - 0.10	0
Demeton-S	3	<0.10 - 0.10	0
Diazinon	3	<0.10 - 0.10	0
Disulfoton	3	<0.10 - 0.10	0
Methylparathion	3	<0.10 - 0.10	0
Ronnel	3	<0.10 - 0.10	0
Fenthion	3	<0.10 - 0.10	0
Chlopyrifos	3	<0.10 - 0.10	0
Trichlorinate	3	<0.10 - 0.10	0
Merphos	3	<0.10 - 0.10	0
Stirofos	3	<0.10 - 0.10	0
Tokuthion	3	<0.10 - 0.10	0
Fensulfothion	3	<0.10 - 0.10	0
Bolstar	3	<0.10 - 0.10	0
Azinphos methyl	3	<0.10 - 0.10	0
Coumaphos	3	<0.10 - 0.10	0
Others			
Asbestos	15	Present	Present
1			

1 LQM/CIEH, S4ULs for Human Health Risk Assessment, S4UL3279, 2015

2 All values in mg/kg, unless otherwise stated

3 Soil organic matter (SOM) content in %, based on average total organic carbon content

4 CL:AIRE, Development of Category 4 Screening Levels (C4SL) for Assessment of Land Affected by Contamination (Revision 2), SP1010, 2014

London – Twickenham

London – Central

Ash Vale

Birmingham

Chester

Manchester

Huddersfield

Newcastle upon Tyne

Glasgow

Dubai

Sydney