

Our Ref: D6643/2

Chris Cockerline
Partner Construction
Durhamgate Suite 1
Green Lane
Spennymoor
County Durham
DL16 6FY

Date: 6th October 2015

Dear Chris,

ADDITIONAL GROUND INVESTIGATION – NANNY MARR ROAD, DARFIELD

Dunelm Geotechnical and Environmental Ltd (Dunelm) were commissioned by Partner Construction and Peveril Securities Ltd to carry out further site investigation of land at Nanny Marr Road, Darfield. This letter report contains the information from this additional investigation.

Introduction

Dunelm have previously carried out a Geoenvironmental Appraisal on site and the findings can be found in the following report:

- D6643/1 Geoenvironmental Appraisal Report dated March 2015.

The results from the previous report indicated asbestos within one of the exploratory holes, additionally, no investigation was allowed in the southeast of the site due to the location of an existing building and gas main.

Additional Investigation Works

This letter report presents the factual and interpretive information obtained during the investigation.

Dunelm attended site on 10th September 2015 and hand excavated trial pits within areas previously occupied by a building and a gas main, additional samples were taken from across the site. The aim of the investigation was to determine the nature of the soils located within the southeast area of the site and to further determine the presence of asbestos from additional sampling across the site.

Fieldwork

Twelve trial pits (HDTP01 to HDTP12) were hand excavated to depths ranging from 0.30m to 1.20m below ground level and the approximate trial pit locations are shown on Drawing D6643/03 enclosed. Exploratory hole logs relating to each of the trial pits are also enclosed.

Ground Conditions

Strata encountered were generally similar beneath all parts of the site. Topsoil was not encountered.

Made ground was encountered across the site up to at least 1.20m thick. The made ground generally consisted of granular material including demolition arisings. No buried obstructions were identified in the trial pits excavated.

During excavation of the trial pits, the side walls were observed to be generally stable.

Groundwater was not encountered during this investigation.

No visual or olfactory evidence of hydrocarbon contamination was noted during the investigation.

Chemical Testing

Appropriate chemical testing has been undertaken taking into account the potential contaminants identified and evidence of contamination recorded during the previous ground investigation.

Laboratory test certificates are attached.

Proposed Site Development

It is proposed that the site will be a mixed development with the western area of the site to be used for commercial use and the eastern area of the site as a potential residential site. Therefore the results of the chemical testing will be assessed based on their potential end use.

Generic Assessment Criteria for Inorganic Contamination

In line with new published guidance the results from both the previous ground investigation and the additional investigation have been assessed using the new parameters.

Generic Assessment Criteria (GAC) appropriate to current UK practice for the assessment of inorganic contamination are shown in the table below. These criteria are dependent on the nature of the proposed development. In addition, some contaminants depend on other soil parameters as shown.

Generic Assessment Criteria for Human Health

<i>All values in mg/kg</i>	Residential (based on 6% SOM)	Residential without homegrown produce (based on 6% SOM)	Commercial (based on 6% SOM)	Allotments (based on 6% SOM)	Public Open space (resi) (based on 6% SOM)
Arsenic	37	40	640	43	79
Cadmium	11	85	190	1.9	120
Chromium (Total)	910	910	8,600	18,000	1,500
Chromium (VI)	6	6	33	1.8	7.7
Copper	2,400	7,100	68,000	520	12,000
Lead	200*	310*	2,330*	80*	No SSV
Mercury	40	56	1,100	19	120
Nickel	130	180	980	53	230
Selenium	250	430	12,000	88	1,100
Zinc	3,700	40,000	730,000	620	81,000

Soil Screening Values from the LQM/CIEH S4ULs for Human Health Risk Assessment (2015). *Taken from DEFRA C4SL database

Residential end use (Eastern Area of Site)

Contaminant	Units	No. of samples tested	No. of samples exceeding GAC	Generic Assessment Criteria	Max concentration on above GAC mg/kg
pH	-	11	0	<5	7.2-8.9
Arsenic	mg/kg	11	0	37	28
Cadmium	mg/kg	11	0	11	1.4

Chromium (Total)	mg/kg	11	0	910	52
Chromium (VI)	mg/kg	11	0	6	<1
Lead	mg/kg	11	0	200	100
Mercury	mg/kg	11	0	40	0.25
Nickel	mg/kg	11	0	130	25
Selenium	mg/kg	11	0	250	0.8
Copper (GAC from MAFF)	mg/kg	11	0	2400	130
Zinc (GAC from MAFF)	mg/kg	11	0	3,700	220
Asbestos	-	9	1	Present	TP3 0.20m (Crocidolite present as fibre bundle)

Based on the above no significantly elevated concentrations of contaminants were identified.

Asbestos Testing

A single sample of made ground has been found to contain asbestos, present as crocidolite fibre bundle.

Commercial end use (Western Area of Site)

Contaminant	Units	No. of samples tested	No. of samples exceeding GAC	Generic Assessment Criteria	Max concentration above GAC mg/kg
pH	-	11	0	<5	-
Arsenic	mg/kg	11	0	640	18
Cadmium	mg/kg	11	0	190	0.8
Chromium (Total)	mg/kg	11	0	8,600	73
Chromium (VI)	mg/kg	11	0	33	<1
Lead	mg/kg	11	0	2,330*	78
Mercury	mg/kg	11	0	1,100	0.36
Nickel	mg/kg	11	0	980	27
Selenium	mg/kg	11	0	12,000	0.5
Copper (GAC from MAFF)	mg/kg	11	0	68,000	48
Zinc (GAC from MAFF)	mg/kg	11	0	730,000	92
Asbestos	-	9	2	Present	HDTP01 0.20m (Amosite present as fibre bundles.) HDTP02 0.20m (Amosite present as small clump)

Based on the above no significantly elevated concentrations of contaminants were identified.

Asbestos Testing

Two samples of made ground were found to contain asbestos, present as amosite fibre bundles or a small clump.

Organic Contamination

The selection of hydrocarbon (organic) testing was based on the conceptual model and the assessment of potential contamination sources identified during the previous site investigation.

Analysis for organic determinands has been carried out in general accordance with the EA Report: *The UK Approach for Evaluating Human Health Risks from Petroleum Hydrocarbons in Soils* (2005). Consequently, samples of made ground were tested for the following:

- 13 petroleum hydrocarbon fractions based on the methodology of the United States Total Petroleum Hydrocarbon Criteria Working Group (TPHCWG)
- Polynuclear aromatic hydrocarbon compounds.

Results for the 13 petroleum hydrocarbon fractions are presented in the table below together with appropriate generic assessment criteria.

Summary of Results for Petroleum Hydrocarbon Fractions

EC bands	Aromatic fractions							Aliphatic fractions					
	5-7	7-8	8-10	10-12	12-16	16-21	21-35	5-6	6-8	8-10	10-12	12-16	16-35
GAC (residential with plant uptake) mg/kg	300	660	190	380	660	930	1,700	160	530	150	760	4300	110,000
GAC (allotment) mg/kg	57	120	51	74	130	260	1,600	3,900	13,000	1,700	7,300	13,000	270,000
GAC (commercial) mg/kg	86,000	180,000	17,000	34,000	38,000	28,000	28,000	12,000	40,000	11,000	47,000	90,000	180,000
GAC (Public Open Space)	56,000	56,000	5,000	5,000	5,000	3,800	3,800	600,000	620,000	13,000	13,000	13,000	250,000
Sample location & depth (m bgl)	Recorded concentrations (mg/kg) - exceedances in bold												
Residential end use													
TP3 0.20m	<0.01	<0.01	<0.01	<0.9	<0.5	<0.6	<1.4	<0.01	<0.01	<0.01	<1.5	<1.2	<3.4
TP4 0.20m	<0.01	<0.01	<0.01	18	4.4	95	220	<0.01	<0.01	<0.01	<1.5	<1.2	<3.4
HDTP03 0.30m	<0.01	0.01	<0.01	<0.9	<0.5	6.0	14	<0.01	<0.01	<0.01	<1.5	<1.2	<3.4
HDTP04 0.30m	<0.01	<0.01	<0.01	<0.9	<0.5	1.2	<1.4	<0.01	<0.01	<0.01	<1.5	<1.2	<3.4
HDTP07 0.30m	<0.01	<0.01	<0.01	<0.9	<0.5	<0.6	<1.4	<0.01	<0.01	<0.01	<1.5	<1.2	<3.4
Commercial end use													
HDTP01 0.20m	<0.01	<0.01	<0.01	<0.9	5.1	93	960	<0.01	<0.01	<0.01	<1.5	4.1	751
HDTP10 0.20m	<0.01	<0.01	<0.01	<0.9	<0.5	0.9	<1.4	<0.1	<0.01	<0.01	<1.5	<1.2	<3.4
TP7 1.00m	<0.01	<0.01	<0.01	<0.9	<0.5	3.5	16	<0.01	<0.01	<0.01	<1.5	<1.2	<3.4
TP14 0.20m	<0.01	<0.01	<0.01	<0.9	<0.5	<0.6	<1.4	<0.01	<0.01	<0.01	<1.5	<1.2	<3.4

Soil Screening Values from the LQM/CIEH S4ULs for Human Health Risk Assessment (2015) for a 3.8% SOM soil, for a commercial industrial after use.

The above assessment of the 13 Petroleum hydrocarbon fractions indicates that no significant concentrations have been recorded during the previous or additional ground investigations.

Residential End use (Eastern Area of Site)

Summary of Results for Polynuclear Aromatic Hydrocarbons

Contaminant	Generic Assessment Criteria (mg/kg)	No. of samples tested	No. of samples with value greater than GAC	Max concentration (mg/kg)
	Residential with plant uptake			
Acenaphthene	1,100	11	0	4.9
Acenaphthylene	920	11	0	2.5
Anthracene	2,400	11	0	24
Benzo(a)anthracene	13	11	1	39
Benzo(a)pyrene	3	11	2	32
Benzo(b)fluoranthene	3.7	11	1	23
Benzo(g,h,i)perylene	350	11	0	16
Benzo(k)fluoranthene	100	11	0	15
Chrysene	27	11	1	36
Dibenz(a,h)anthracene	0.3	11	3	2
Fluoranthene	890	11	0	120
Fluorene	860	11	0	8.8
Indeno(1,2,3,-cd)pyrene	41	11	0	19
Napthalene	13	11	0	0.1
Phenanthrene	440	11	0	80
Pyrene	2,000	11	0	100

Soil Screening Values from the LQM/CIEH S4ULs for Human Health Risk Assessment (2015) for 6% SOM soil, for a residential after use.

The combined results for the previous and additional ground investigation has indicated elevated PAH TP1 0.20m, TP2 0.20m and TP4 0.20m.

Commercial end use (Western Area of Site)

Contaminant	Generic Assessment Criteria (mg/kg)	No. of samples tested	No. of samples with value greater than GAC	Max concentration (mg/kg)
	Commercial / industrial			
Acenaphthene	100,000	7	0	0.5
Acenaphthylene	100,000	7	0	0.3
Anthracene	540,000	7	0	1.6
Benzo(a)anthracene	180	7	0	5.9
Benzo(a)pyrene	36	7	0	2
Benzo(b)fluoranthene	45	7	0	4.3
Benzo(g,h,i)perylene	4,000	7	0	2.5
Benzo(k)fluoranthene	1,200	7	0	2.9
Chrysene	350	7	0	6.1
Dibenz(a,h)anthracene	3.6	7	0	0.9
Fluoranthene	23,000	7	0	15

Fluorene	71,000	7	0	0.6
Indeno(1,2,3,-cd)pyrene	510	7	0	3.7
Napthalene	1,100	7	0	0.3
Phenanthrene	23,000	7	0	5.5
Pyrene	54,000	7	0	1.5

Soil Screening Values from the LQM/CIEH S4ULs for Human Health Risk Assessment (2015) for 2.5% SOM soil, for a commercial industrial after use.

The combined results for the previous and additional ground investigation has indicated no elevated PAH.

Leachability Test Results

A summary of the leachability testing results is shown below together with appropriate Tier 1 Remedial Targets based on the environmental setting of the site. In accordance with the methodology described in Environment Agency *R&D Publication 20*, for Tier 1 assessment the Remedial Target is equal to the Target Concentration.

Summary of Leachability Test Results (inorganic)

Contaminant	Units	No. of leachate samples tested	No. of samples exceeding GAC	GAC (Tier 1 Remedial Target)	Max concentration in leachate samples
pH	-	4	0	Range 6.5 - 10 *	7.1
Arsenic	mg/l	4	0	0.05 #	0.0028
Cadmium	mg/l	4	0	0.005 * #	0.1
Chromium (Total)	mg/l	4	0	0.05 *	0.00066
Lead	mg/l	4	0	0.025 * 0.05#	0.00057
Mercury	mg/l	4	0	0.001 * #	<0.00001
Selenium	mg/l	4	0	0.01 *	0.0013
Copper	mg/l	4	0	2 *	0.0017
Nickel	mg/l	4	0	0.02 *0.05#	0.0006
Zinc	mg/l	4	0	5 * 0.075#	0.00188
Threshold values					
* <i>Water Supply (Water Quality) Regulations 1989 (amended 2000)</i>					
# Environmental Quality Standard (lowest value used for hardness dependent contaminants)					

Based on the above, there are no results which exceeded the Tier 1 remedial targets and therefore do not require further consideration.

Summary of Leachability Test Results (organic)

Contaminant	Units	No. of leachate samples tested	No. of samples exceeding GAC	GAC (Tier 1 Remedial Target)	Max concentration in leachate samples
TPH C ₆ to C ₁₀	mg/l	4	0	(0.001) ◇ *	<0.00001
TPH C ₆ to C ₁₀	mg/l	4		(0.03) # ◇	
TPH C ₁₀ to C ₄₀	mg/l	4	0	(0.01) **	<0.00001
TPH C ₁₀ to C ₄₀	mg/l	4		(1) \$\$	

Benzo(a)pyrene	mg/l	4	1	(0.00001)*	0.0013
Phenols	mg/l	3	2	(0.0005)	0.6
Threshold values * <i>Water Supply (Water Quality) Regulations 1989 (amended 2000)</i> ** Value for oils/hydrocarbons cited in Environment Agency Report <i>Technical Advice to Third Parties on Pollution of Controlled Waters for Part IIA of the EPA 1990</i> (equivalent to drinking water standard) # Environmental Quality Standard ◇ 'Conservative' value assuming all TPH C ₆ to C ₁₀ is benzene \$\$ DW3 Criteria For Classification Of Waters limit for Dissolved or Emulsified Hydrocarbons - <i>Surface Waters (Abstraction for Drinking Water) (Classification) Regulations 1996</i>					

Based on the above results, three samples exceeded the Tier 1 remedial targets and therefore require further consideration.

ASSESSMENT OF CONTAMINATION RISKS

Summary of Contamination Sources

Made Ground

The majority of the site is underlain by a layer of granular made ground up to at least 1.2m thick.

Testing has indicated that this made ground does not contain elevated concentrations of inorganic contaminants. The made ground does however contain asbestos (amosite and crocidolite) and other materials such as glass which are unsuitable to remain in garden areas as a near-surface material.

Hydrocarbon Contamination

Hydrocarbon contamination was encountered during this investigation in the made ground in the proposed residential development.

Leachable Contamination

Testing has indicated that two samples tested where in excess of the Tier 1 Remedial Target.

Hazard Assessment

The results of the 'Hazard Identification' process for significant sources of contamination in accordance with CLR11 are summarised above. The following section describes the results of the 'Hazard Assessment' process in which unacceptable risks are identified. Pathways and receptors are considered below.

Pathways

The proposed end use of the development is a combined residential and commercial development. Potential contaminant pathways to humans therefore include:

- ingestion of soil (outdoors) / dust (indoors)
- skin contact with soil (outdoors) / dust (indoors)
- inhalation of dust (outdoors and indoors)
- consumption of vegetables & soil attached to vegetables
- contamination via buried water pipes

Potential contaminant pathways to controlled water receptors include:

- surface water run-off, including via existing drainage infrastructure

Receptors

Significant potential receptors are as follows:

- end users of the site (residents/building occupiers)
- plants in gardens / landscaped areas

Transient risks to construction workers will be addressed by the adoption of appropriate health and safety measures and consequently this receptor group has not been considered further.

Based on the revised Conceptual Site Model, unacceptable risks have been identified and further action will be required as discussed in the following section.

Inorganic Contamination - Made Ground

The made ground has been found to contain asbestos. Asbestos has been identified within two areas located within the western area of the site. These areas are to be covered with hardstanding as part of the commercial development areas and would be suitably isolated from future site users. If this strategy is adopted, a site health and safety plan should be produced for the retention of the building management company. This plan should ensure that future maintenance and development work is undertaken with due regard to the possibility that asbestos could be encountered and should set out the precautions that should be taken.

Made ground located within the eastern area of the site contains elevated concentrations of PAH compounds at three of the eleven locations on the site. Asbestos was found in one of the eleven locations tested. In view of this the following is recommended:

1. Either, all made ground containing asbestos and PAH contamination is removed from site and the remaining made ground is covered, in landscaping and garden areas with a clean cover layer of at least 600mm thickness or,
2. The made ground containing asbestos remains on site and the clean cover layer should also include a mechanical break layer and geotextile asbestos alert membrane agreed with the Local Authority. If this strategy is adopted, a site health and safety plan should be produced for the retention of the Planning Authority. This plan should ensure that future development work is undertaken with due regard to the possibility asbestos could be encountered and should set out the precautions that should be taken.

An alternative strategy to isolate the organic contamination from end users would require the contaminated made ground to be excavated and replaced beneath areas of hardstanding.

It is recommended that further advice be sought from all statutory service bodies with respect to the ground conditions within which they will lay services.

If during redevelopment works on site any noxious, brightly coloured, drummed, liquid, etc waste is encountered, works should cease in these areas and further advice should be sought from a suitably qualified consultant.

Leachable Contamination

Testing has indicated that the made ground has the potential to produce leachable PAH at concentrations in excess of the Tier 1 Remedial Target selected. These leachable concentrations are consistent with contamination identified within the soils in this area.

However, the risk to Controlled Waters is considered negligible for the reasons detailed below:

- Once developed, the site will be almost entirely covered by buildings and hardstand and consequently rainwater infiltration will be greatly reduced.
- Following proposed remediation of the site, landscaped areas will be covered by a 600mm clean cover layer, further reducing rainwater infiltration.
- Concentrations of leachable contamination, although elevated are only slightly above the relevant threshold levels. At these low concentrations it is considered that by the time contamination reached the Controlled Water receptor, concentrations of contamination would have been diluted so much that there would be no significant risk posed to the receptor.

Remediation Strategy

Applying the new published guidelines to both the previous and additional chemical testing the level of contamination on site has indicated that the asbestos and elevated PAH identified within both the proposed residential and commercial areas needs addressing.

A Remediation Strategy will be required by the regulatory authorities prior to site redevelopment. The Remediation Strategy document would describe the objectives of the proposed remedial works; a Method Statement is normally required from the Contractor undertaking the works, describing how these objectives are to be met. Validation of the remediation works should be undertaken by a suitably qualified engineer.

We trust that the above is satisfactory for your present needs, however should you have any queries please do not hesitate to get in touch.

Regards,

Sarah Crick

For and on behalf of Dunelm Geotechnical and Environmental



Area inaccessible due to underground gas main



Contract:
Nanny Marr Road, Darfield

Drawing Title:
Exploratory Hole Location Plan – October 2015 Investigation

Drawing No:
D6643/03

Date:
October 2015

Scale:
NTS

Drawn by:
SC



TRIAL PIT RECORD

TP No.
HOTP02

Contract No.: D6643

Site: Nanny Marr Road, Darfield

Scale 1:25

Client: Partner Construction and Peveril Securities Ltd

Logged By: RB

Sheet 1 of 1

Method: Hand Dug Trial Pit

Checked By: SC

Dates: 10/09/2015

SAMPLE DETAILS			Groundwater	STRATA RECORD Description	Depth (m)	Level (m AOD) PID (ppm)	Legend	Backfill
Type	Depth From-To (m)	Insitu Testing						
ES	0.20			MADE GROUND: Brown slightly gravelly sand. Gravel is angular to sub angular, fine to coarse of sandstone and brick.	0.20			
				MADE GROUND: Grey, very gravelly, sandy clay. Sand is fine to medium. Gravel is fine to coarse, angular, subrounded of dolomite and brick.				
ES	0.80			MADE GROUND: Grey, gravelly sand. Sand is fine to coarse. Gravel is angular, subrounded, fine to coarse of sandstone.	0.70			
			1	----- End of Trial Pit at 1.20 m	1.20			
			2					
			3					
			4					
			5					

Remarks	Ground Water (m)		Excavation Details		Orientation	
	Depth Strike	Remarks	Dimensions: m x m		<div style="display: flex; align-items: center; justify-content: center;"> D <div style="border: 1px solid black; padding: 5px; text-align: center;"> A C B </div> ° </div>	
			Stability:			
			Weather:			
		Remarks: Hand Dug Trial Pit				



TRIAL PIT RECORD

**TP No.
HOTP03**

Contract No.: D6643

Site: Nanny Marr Road, Darfield

Scale 1:25

Client: Partner Construction and Peveril Securities Ltd

Logged By: RB

Sheet 1 of 1

Method: Hand Dug Trial Pit

Checked By: SC

Dates: 10/09/2015

SAMPLE DETAILS			Groundwater	STRATA RECORD Description	Depth (m)	Level (m AOD) PID (ppm)	Legend	Backfill
Type	Depth From-To (m)	Insitu Testing						
ES	0.10			MADE GROUND: Brown slightly gravelly sand. Gravel is angular to sub angular, fine to coarse of sandstone and brick.	0.10			
ES	0.30			MADE GROUND: Grey and light brown, gravelly, sandy, clay. Sand is fine to medium. Gravel is subangular, subrounded, fine to coarse of dolomite. ----- End of Trial Pit at 0.30 m	0.30			
			1					
			2					
			3					
			4					
			5					

Remarks	Ground Water (m)		Excavation Details		Orientation									
	Depth Strike	Remarks	Dimensions: m x m		<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <table style="border-collapse: collapse;"> <tr> <td style="padding: 0 10px;">D</td> <td style="padding: 0 10px;">A</td> <td style="padding: 0 10px;">B</td> <td style="padding: 0 10px;">°</td> </tr> <tr> <td></td> <td style="padding: 0 10px;">C</td> <td></td> <td></td> </tr> </table> </div>		D	A	B	°		C		
	D	A	B	°										
		C												
		Stability:												
		Weather:												
		Remarks: Hand Dug Trial Pit												



TRIAL PIT RECORD

**TP No.
HOTP04**

Contract No.: D6643

Site: Nanny Marr Road, Darfield

Scale 1:25

Client: Partner Construction and Peveril Securities Ltd

Logged By: RB

Sheet 1 of 1

Method: Hand Dug Trial Pit

Checked By: SC

Dates: 10/09/2015

SAMPLE DETAILS			Groundwater	STRATA RECORD Description	Depth (m)	Level (m AOD) PID (ppm)	Legend	Backfill
Type	Depth From-To (m)	Insitu Testing						
ES	0.10			MADE GROUND: Brown slightly gravelly sand. Gravel is angular to sub angular, fine to coarse of sandstone and brick.	0.10			
ES	0.30			MADE GROUND: Grey and light brown, gravelly, sandy, clay. Sand is fine to medium. Gravel is subangular, subrounded, fine to coarse of dolomite. ----- End of Trial Pit at 0.30 m	0.30			
			1					
			2					
			3					
			4					
			5					

Remarks	Ground Water (m)		Excavation Details		Orientation									
	Depth Strike	Remarks	Dimensions: m x m		<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <table style="border-collapse: collapse;"> <tr> <td style="padding: 0 10px;">D</td> <td style="padding: 0 10px;">A</td> <td style="padding: 0 10px;">B</td> <td style="padding: 0 10px;">°</td> </tr> <tr> <td></td> <td style="padding: 0 10px;">C</td> <td></td> <td></td> </tr> </table> </div>		D	A	B	°		C		
	D	A	B	°										
		C												
		Stability:												
		Weather:												
		Remarks: Hand Dug Trial Pit												



TRIAL PIT RECORD

**TP No.
HOTP05**

Contract No.: D6643

Site: Nanny Marr Road, Darfield

Scale 1:25

Client: Partner Construction and Peveril Securities Ltd

Logged By: RB

Sheet 1 of 1

Method: Hand Dug Trial Pit

Checked By: SC

Dates: 10/09/2015

SAMPLE DETAILS			Groundwater	STRATA RECORD Description	Depth (m)	Level (m AOD) PID (ppm)	Legend	Backfill
Type	Depth From-To (m)	Insitu Testing						
ES	0.10			MADE GROUND: Brown slightly gravelly sand. Gravel is angular to sub angular, fine to coarse of sandstone and brick.	0.10			
ES	0.30			MADE GROUND: Grey and light brown, gravelly, sandy, clay. Sand is fine to medium. Gravel is subangular, subrounded, fine to coarse of dolomite. ----- End of Trial Pit at 0.30 m	0.30			
			1					
			2					
			3					
			4					
			5					

Remarks	Ground Water (m)		Excavation Details		Orientation									
	Depth Strike	Remarks	Dimensions: m x m		<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <table style="border-collapse: collapse;"> <tr> <td style="padding: 0 10px;">D</td> <td style="padding: 0 10px;">A</td> <td style="padding: 0 10px;">B</td> <td style="padding: 0 10px;">°</td> </tr> <tr> <td></td> <td style="padding: 0 10px;">C</td> <td></td> <td></td> </tr> </table> </div>		D	A	B	°		C		
	D	A	B	°										
		C												
		Stability:												
		Weather:												
		Remarks: Hand Dug Trial Pit												



TRIAL PIT RECORD

**TP No.
HOTP06**

Contract No.: D6643

Site: Nanny Marr Road, Darfield

Scale 1:25

Client: Partner Construction and Peveril Securities Ltd

Logged By: RB

Sheet 1 of 1

Method: Hand Dug Trial Pit

Checked By: SC

Dates: 10/09/2015

SAMPLE DETAILS			Groundwater	STRATA RECORD Description	Depth (m)	Level (m AOD) PID (ppm)	Legend	Backfill
Type	Depth From-To (m)	Insitu Testing						
ES	0.10			MADE GROUND: Brown slightly gravelly sand. Gravel is angular to sub angular, fine to coarse of sandstone and brick.	0.10			
ES	0.30			MADE GROUND: Brown gravelly sand. Sand is fine to coarse. Gravel is subangular, fine to coarse of sandstone and brick. ----- End of Trial Pit at 0.30 m	0.30			
			1					
			2					
			3					
			4					
			5					

Remarks	Ground Water (m)		Excavation Details		Orientation									
	Depth Strike	Remarks	Dimensions: m x m		<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <table style="border-collapse: collapse;"> <tr> <td style="padding: 0 10px;">D</td> <td style="text-align: center; padding: 0 10px;">A</td> <td style="padding: 0 10px;">B</td> <td style="padding: 0 10px;">°</td> </tr> <tr> <td></td> <td style="text-align: center;">C</td> <td></td> <td></td> </tr> </table> </div>		D	A	B	°		C		
	D	A	B	°										
		C												
		Stability:												
		Weather:												
		Remarks: Hand Dug Trial Pit												



TRIAL PIT RECORD

**TP No.
HOTP07**

Contract No.: D6643

Site: Nanny Marr Road, Darfield

Scale 1:25

Client: Partner Construction and Peveril Securities Ltd

Logged By: RB

Sheet 1 of 1

Method: Hand Dug Trial Pit

Checked By: SC

Dates: 10/09/2015

SAMPLE DETAILS			Groundwater	STRATA RECORD Description	Depth (m)	Level (m AOD) PID (ppm)	Legend	Backfill
Type	Depth From-To (m)	Insitu Testing						
ES	0.10			MADE GROUND: Brown slightly gravelly sand. Gravel is angular to sub angular, fine to coarse of sandstone and brick.	0.10			
ES	0.30			MADE GROUND: Grey and light brown, gravelly, sandy, clay. Sand is fine to medium. Gravel is subangular, subrounded, fine to coarse of dolomite. ----- End of Trial Pit at 0.30 m	0.30			
			1					
			2					
			3					
			4					
			5					

Remarks	Ground Water (m)		Excavation Details		Orientation									
	Depth Strike	Remarks	Dimensions: m x m		<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <table style="border-collapse: collapse;"> <tr> <td style="padding: 0 10px;">D</td> <td style="padding: 0 10px;">A</td> <td style="padding: 0 10px;">B</td> <td style="padding: 0 10px;">°</td> </tr> <tr> <td></td> <td style="padding: 0 10px;">C</td> <td></td> <td></td> </tr> </table> </div>		D	A	B	°		C		
	D	A	B	°										
		C												
		Stability:												
		Weather:												
		Remarks: Hand Dug Trial Pit												



TRIAL PIT RECORD

TP No.
HDP08

Contract No.: D6643

Site: Nanny Marr Road, Darfield

Scale 1:25

Client: Partner Construction and Peveril Securities Ltd

Logged By: RB

Sheet 1 of 1

Method: Hand Dug Trial Pit

Checked By: SC

Dates: 10/09/2015

SAMPLE DETAILS			Groundwater	STRATA RECORD Description	Depth (m)	Level (m AOD) PID (ppm)	Legend	Backfill
Type	Depth From-To (m)	Insitu Testing						
ES	0.20			MADE GROUND: Brown slightly gravelly sand. Gravel is angular to sub angular, fine to coarse of sandstone and brick. MADE GROUND: White sandy gravel. Sand is fine to coarse. Gravel is angular, subrounded, fine to coarse of dolomite.	0.10			
ES	0.80			----- End of Trial Pit at 0.80 m	0.80			
			1					
			2					
			3					
			4					
			5					

Remarks	Ground Water (m)		Excavation Details		Orientation	
	Depth Strike	Remarks	Dimensions: m x m		<div style="border: 1px solid black; padding: 5px; display: inline-block;"> D A B ° C </div>	
			Stability:			
			Weather:			
		Remarks: Hand Dug Trial Pit				



TRIAL PIT RECORD

TP No.
HDP09

Contract No.: D6643

Site: Nanny Marr Road, Darfield

Scale 1:25

Client: Partner Construction and Peveril Securities Ltd

Logged By: RB

Sheet 1 of 1

Method: Hand Dug Tiral Pit

Checked By: SC

Dates: 10/09/2015

SAMPLE DETAILS			Groundwater	STRATA RECORD Description	Depth (m)	Level (m AOD) PID (ppm)	Legend	Backfill
Type	Depth From-To (m)	In situ Testing						
ES	0.20			MADE GROUND: Brown slightly gravelly sand. Gravel is angular to sub angular, fine to coarse of sandstone and brick.	0.20			
				MADE GROUND: Brown and grey, slightly gravelly, sandy clay. Sand is fine to medium. Gravel is subangular, subrounded, fine to coarse of sandstone and brick.	0.50			
ES	0.50			Light brown, gravelly SAND. Sand is fine to medium. Gravel is subangular, subrounded, fine to coarse of sandstone.	1.10			
				Light brown, fine to medium SAND.	1.20			
				----- End of Trial Pit at 1.20 m				

Remarks	Ground Water (m)		Excavation Details		Orientation									
	Depth Strike	Remarks	Dimensions: m x m		<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <table style="border-collapse: collapse;"> <tr> <td style="padding: 5px;">D</td> <td style="padding: 5px;">A</td> <td style="padding: 5px;">B</td> <td style="padding: 5px;">°</td> </tr> <tr> <td></td> <td style="padding: 5px;">C</td> <td></td> <td></td> </tr> </table> </div>		D	A	B	°		C		
	D	A	B	°										
		C												
		Stability:												
		Weather:												
		Remarks: Hand Dug Tiral Pit												



TRIAL PIT RECORD

TP No.
HOTP11

Contract No.: D6643

Site: Nanny Marr Road, Darfield

Scale 1:25

Client: Partner Construction and Peveril Securities Ltd

Logged By: RB

Sheet 1 of 1

Method: Hand Dug Trial Pit

Checked By: SC

Dates: 10/09/2015

SAMPLE DETAILS			Groundwater	STRATA RECORD Description	Depth (m)	Level (m AOD) PID (ppm)	Legend	Backfill
Type	Depth From-To (m)	In situ Testing						
ES	0.20			MADE GROUND: Brown slightly gravelly sand. Gravel is angular to sub angular, fine to coarse of sandstone and brick.	0.20			
ES	0.40			MADE GROUND: White sandy gravel. Sand is fine to medium. Gravel is angular, subangular, fine to coarse of dolomite.	0.40			
				MADE GROUND: Brown gravelly sand. Sand is fine to coarse. Gravel is angular, subrounded, fine to coarse of sandstone and dolomite.	0.50			
				Light brown gravelly SAND. Sand is fine to medium. Gravel is subangular, subrounded, fine to coarse of sandstone.	0.50			
ES	1.10		1	----- End of Trial Pit at 1.10 m	1.10			
			2					
			3					
			4					
			5					

Remarks	Ground Water (m)		Excavation Details		Orientation									
	Depth	Strike	Remarks	Dimensions: m x m	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <table style="border-collapse: collapse;"> <tr> <td style="padding: 0 10px;">D</td> <td style="text-align: center; padding: 0 10px;">A</td> <td style="padding: 0 10px;">B</td> <td style="padding: 0 10px;">°</td> </tr> <tr> <td></td> <td style="text-align: center;">C</td> <td></td> <td></td> </tr> </table> </div>		D	A	B	°		C		
	D	A	B	°										
		C												
			Stability:											
			Weather:											
			Remarks: Hand Dug Trial Pit											



TRIAL PIT RECORD

TP No.
HOTP12

Contract No.: D6643

Site: Nanny Marr Road, Darfield

Scale 1:25

Client: Partner Construction and Peveril Securities Ltd

Logged By: RB

Sheet 1 of 1

Method: Hand Dug Trial Pit

Checked By: SC

Dates: 10/09/2015

SAMPLE DETAILS			Groundwater	STRATA RECORD Description	Depth (m)	Level (m AOD) PID (ppm)	Legend	Backfill
Type	Depth From-To (m)	Insitu Testing						
ES	0.20		1	MADE GROUND: Brown slightly gravelly sand. Gravel is angular to sub angular, fine to coarse of sandstone and brick. MADE GROUND: White sandy gravel. Sand is fine to coarse. Gravel is angular, subrounded, fine to coarse of dolomite.	0.10			
ES	0.30							
ES	0.85			2	----- End of Trial Pit at 0.80 m	0.80		
			3					
			4					
			5					

Remarks	Ground Water (m)		Excavation Details		Orientation									
	Depth Strike	Remarks	Dimensions: m x m		<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <table style="border-collapse: collapse;"> <tr> <td style="padding: 0 10px;">D</td> <td style="padding: 0 10px;">A</td> <td style="padding: 0 10px;">B</td> <td style="padding: 0 10px;">°</td> </tr> <tr> <td></td> <td style="padding: 0 10px;">C</td> <td></td> <td></td> </tr> </table> </div>		D	A	B	°		C		
	D	A	B	°										
		C												
		Stability:												
		Weather:												
		Remarks: Hand Dug Trial Pit												



TRIAL PIT RECORD

TP No.
TP1

Contract No.: D6643

Site: Nanny Marr Road, Darfield

Scale 1:25

Client: Partner Construction and Peveril Securities Ltd

Logged By: FM

Sheet 1 of 1

Method: JCB 3CX

Checked By: AIL

Dates: 16/02/2015

SAMPLE DETAILS			Groundwater	STRATA RECORD Description	Depth (m)	Level (m AOD) PID (ppm)	Legend	Backfill
Type	Depth From-To (m)	Insitu Testing						
ES	0.20			MADE GROUND: Brown slightly gravelly sand with occasional cobbles. Gravel is angular to sub angular, fine to coarse of sandstone, mudstone, brick and glass. Cobbles are sub angular of sandstone.	0.50			
ES	0.70			MADE GROUND: Red sandy gravel. Gravel is fine to coarse, angular to sub angular of red shale, brick, mudstone and sandstone. MADE GROUND: White gravel with occasional cobbles. Gravel is fine to coarse, sub angular of dolomite. Cobbles are sub angular of dolomite.	0.60			
D	2.00		1 2	Yellow highly weathered sandstone. Recovered as gravelly SAND. Gravel is fine to coarse, sub angular to angular of sandstone.	0.90			
End of Trial Pit at 2.50 m					2.50			
			3 4 5					

Remarks 1) No groundwater encountered.	Ground Water (m)		Excavation Details		Orientation	
	Depth Strike	Remarks	Dimensions: m x m		<div style="border: 1px solid black; padding: 5px; display: inline-block;"> D A B C ° </div>	
			Stability: Stable			
			Weather: Dry			
		Remarks: JCB 3CX				



Certificate of Analysis

Certificate Number 15-45483

25-Sep-15

Client Dunelm Geotechnical & Environmental Ltd
Foundation House
St. John's Road
Meadowfield
Durham
DH7 8TZ

Our Reference 15-45483

Client Reference D6643

Contract Title Nanny Marr Road

Description 12 Soil samples, 2 Leachate samples.

Date Received 18-Sep-15

Date Started 18-Sep-15

Date Completed 25-Sep-15

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 15-45483

Client Ref D6643

Contract Title Nanny Marr Road

Lab No	869965	869966	869967	869968	869969	869970
Sample ID	TP1	TP2	TP3	TP4	TP5	TP6
Depth	0.20	0.20	0.30	0.30	0.30	0.30
Other ID						
Sample Type	D	D	D	D	D	D
Sampling Date	n/s	n/s	n/s	n/s	n/s	n/s
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units	869965	869966	869967	869968	869969	869970
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	6.1	4.9	23	5.2	2.9	2.4
Cadmium	DETSC 2301#	0.1	mg/kg	0.4	0.4	0.5	0.3	0.6	0.2
Chromium	DETSC 2301#	0.15	mg/kg	11	7.3	12	11	3.6	5.7
Hexavalent Chromium	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	9.6	11	27	13	5.3	4.1
Lead	DETSC 2301#	0.3	mg/kg	19	19	59	16	15	7.6
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	0.13	0.06	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	10	6.8	14	7.0	2.6	6.2
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	0.5	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	54	45	79	35	76	26
Inorganics									
pH	DETSC 2008#			8.4	9.0	7.2	8.8	8.3	8.2
Cyanide Total	DETSC 2130#	0.1	mg/kg	0.2				< 0.1	
Organic matter	DETSC 2002#	0.1	%	1.3	1.3	19	0.9		0.7
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	1900	220	79	42	11	< 10
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01		
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01		
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01		
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5		< 1.5	< 1.5		
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	4.1		< 1.2	< 1.2		
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	51		< 1.5	< 1.5		
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	700		< 3.4	< 3.4		
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	760		< 10	< 10		
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01		
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01		0.01	< 0.01		
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01	< 0.01		
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9		< 0.9	< 0.9		
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	5.1		< 0.5	< 0.5		
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	93		6.0	1.2		
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	960		14	< 1.4		
Aromatic C5-C35	DETSC 3072*	10	mg/kg	1100		20	< 10		
TPH Ali/Aro	DETSC 3072*	10	mg/kg	1800		20	< 10		

Summary of Chemical Analysis

Soil Samples

Our Ref 15-45483

Client Ref D6643

Contract Title Nanny Marr Road

Lab No	869965	869966	869967	869968	869969	869970
Sample ID	TP1	TP2	TP3	TP4	TP5	TP6
Depth	0.20	0.20	0.30	0.30	0.30	0.30
Other ID						
Sample Type	D	D	D	D	D	D
Sampling Date	n/s	n/s	n/s	n/s	n/s	n/s
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units	869965	869966	869967	869968	869969	869970
PAHs									
Naphthalene	DETSC 3301	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1		< 0.1
Acenaphthylene	DETSC 3301	0.1	mg/kg	0.3	0.2	< 0.1	< 0.1		< 0.1
Acenaphthene	DETSC 3301	0.1	mg/kg	0.3	< 0.1	< 0.1	< 0.1		< 0.1
Fluorene	DETSC 3301	0.1	mg/kg	0.5	< 0.1	< 0.1	< 0.1		< 0.1
Phenanthrene	DETSC 3301	0.1	mg/kg	3.7	1.0	1.0	0.5		0.3
Anthracene	DETSC 3301	0.1	mg/kg	1.0	0.5	0.3	< 0.1		< 0.1
Fluoranthene	DETSC 3301	0.1	mg/kg	4.3	3.7	2.3	1.0		0.8
Pyrene	DETSC 3301	0.1	mg/kg	3.8	3.3	2.0	0.8		0.7
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	1.8	1.8	1.3	< 0.1		< 0.1
Chrysene	DETSC 3301	0.1	mg/kg	1.6	1.7	1.1	< 0.1		< 0.1
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	1.3	1.4	0.9	< 0.1		< 0.1
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	0.8	1.0	0.5	< 0.1		< 0.1
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	1.9	2.1	1.3	< 0.1		< 0.1
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	1.3	1.4	0.9	< 0.1		< 0.1
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	0.8	0.7	0.3	< 0.1		< 0.1
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	1.9	1.8	1.1	< 0.1		< 0.1
PAH	DETSC 3301	1.6	mg/kg	25	21	13	2.4		1.8
Phenols									
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3				< 0.3	

Summary of Chemical Analysis

Soil Samples

Our Ref 15-45483
 Client Ref D6643
 Contract Title Nanny Marr Road

Lab No	869971	869972	869973	869974	869975	869976
Sample ID	TP7	TP8	TP9	TP10	TP11	TP12
Depth	0.30	0.20	0.20	0.20	0.40	0.30
Other ID						
Sample Type	D	D	D	D	D	D
Sampling Date	n/s	n/s	n/s	n/s	n/s	n/s
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Metals									
Arsenic	DETSC 2301#	0.2	mg/kg	4.6	1.9	12	18	4.5	2.1
Cadmium	DETSC 2301#	0.1	mg/kg	0.4	0.3	0.6	0.6	0.3	0.3
Chromium	DETSC 2301#	0.15	mg/kg	6.9	4.4	11	15	5.8	4.3
Hexavalent Chromium	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	9.6	3.7	20	25	6.0	4.0
Lead	DETSC 2301#	0.3	mg/kg	18	10	46	42	12	12
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	0.10	0.11	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	5.6	2.7	14	15	8.5	2.7
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	98	38	85	71	23	33
Inorganics									
pH	DETSC 2008#			8.6	9.0	6.7	7.5	9.3	8.8
Cyanide Total	DETSC 2130#	0.1	mg/kg			0.4			
Organic matter	DETSC 2002#	0.1	%	0.6		4.2	4.9		
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	33	19	18	23	54	24
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01			< 0.01		
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01			< 0.01		
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01			< 0.01		
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5			< 1.5		
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2			< 1.2		
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5			< 1.5		
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4			< 3.4		
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10			< 10		
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01			< 0.01		
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01			< 0.01		
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01			< 0.01		
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9			< 0.9		
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5			< 0.5		
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6			0.9		
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4			< 1.4		
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10			< 10		
TPH Ali/Aro	DETSC 3072*	10	mg/kg	< 10			< 10		

Summary of Chemical Analysis

Soil Samples

Our Ref 15-45483
 Client Ref D6643
 Contract Title Nanny Marr Road

Lab No	869971	869972	869973	869974	869975	869976
Sample ID	TP7	TP8	TP9	TP10	TP11	TP12
Depth	0.30	0.20	0.20	0.20	0.40	0.30
Other ID						
Sample Type	D	D	D	D	D	D
Sampling Date	n/s	n/s	n/s	n/s	n/s	n/s
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	< 0.1	
Acenaphthylene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	
Acenaphthene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	
Fluorene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	
Phenanthrene	DETSC 3301	0.1	mg/kg	0.3		0.4	< 0.1	
Anthracene	DETSC 3301	0.1	mg/kg	< 0.1		0.2	< 0.1	
Fluoranthene	DETSC 3301	0.1	mg/kg	0.8		1.3	0.6	
Pyrene	DETSC 3301	0.1	mg/kg	0.6		1.1	0.5	
Benzo(a)anthracene	DETSC 3301	0.1	mg/kg	< 0.1		0.5	< 0.1	
Chrysene	DETSC 3301	0.1	mg/kg	< 0.1		0.6	< 0.1	
Benzo(b)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1		0.6	< 0.1	
Benzo(k)fluoranthene	DETSC 3301	0.1	mg/kg	< 0.1		0.4	< 0.1	
Benzo(a)pyrene	DETSC 3301	0.1	mg/kg	< 0.1		0.8	< 0.1	
Indeno(1,2,3-c,d)pyrene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	
Dibenzo(a,h)anthracene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	
Benzo(g,h,i)perylene	DETSC 3301	0.1	mg/kg	< 0.1		< 0.1	< 0.1	
PAH	DETSC 3301	1.6	mg/kg	1.7		5.9	< 1.6	
Phenols								
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg			< 0.3		

Summary of Chemical Analysis

Leachate Samples

Our Ref 15-45483
 Client Ref D6643
 Contract Title Nanny Marr Road

Lab No	869977	869978
Sample ID	TP4	TP10
Depth	0.30	0.20
Other ID		
Sample Type	D	D
Sampling Date	n/s	n/s
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
Preparation					
NRA Leachate Preparation	DETS 036*			Y	Y
Metals					
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	2.8	1.6
Boron	DETSC 2123	100	ug/l	< 100	< 100
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03	< 0.03
Chromium, Dissolved	DETSC 2306	0.25	ug/l	0.66	< 0.25
Copper, Dissolved	DETSC 2306	0.4	ug/l	1.7	1.6
Lead, Dissolved	DETSC 2306	0.09	ug/l	0.57	0.55
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	< 0.5	< 0.5
Selenium, Dissolved	DETSC 2306	0.25	ug/l	1.3	0.69
Zinc, Dissolved	DETSC 2306	1.25	ug/l	1.88	< 1.25
Inorganics					
pH	DETSC 2008			7.1	7.1
Sulphate as SO4	DETSC 2055	0.1	mg/l	5.3	1.7
Petroleum Hydrocarbons					
C5-C10 Gasoline Range Organics (GRO)	DETSC 3322	1	ug/l	< 1.0	< 1.0
C10-C24 Diesel Range Organics (DRO)	DETSC 3311	10	ug/l	< 10	< 10
C24-C40 Lube Oil Range Organics (LORO)	DETSC 3311	10	ug/l	< 10	< 10
PAHs					
PAH	DETS 074*	0.2	ug/l	< 0.20	< 0.20

Summary of Asbestos Analysis

Soil Samples

Our Ref 15-45483

Client Ref D6643

Contract Title Nanny Marr Road

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
869965	TP1 0.20	SOIL	Amosite	Amosite present as fibre bundles	Jeff Cruddas
869966	TP2 0.20	SOIL	Amosite	Amosite present as small clump	Jeff Cruddas
869967	TP3 0.30	SOIL	NAD	none	Jeff Cruddas
869968	TP4 0.30	SOIL	NAD	none	Jeff Cruddas
869969	TP5 0.30	SOIL	NAD	none	Jeff Cruddas
869970	TP6 0.30	SOIL	NAD	none	Jeff Cruddas
869971	TP7 0.30	SOIL	NAD	none	Jeff Cruddas
869972	TP8 0.20	SOIL	NAD	none	Jeff Cruddas
869973	TP9 0.20	SOIL	NAD	none	Jeff Cruddas
869974	TP10 0.20	SOIL	NAD	none	Jeff Cruddas
869975	TP11 0.40	SOIL	NAD	none	Jeff Cruddas
869976	TP12 0.30	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 15-45483
Client Ref D6643
Contract Nanny Marr Road

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
869965	TP1 0.20 SOIL		PT 1L	Sample date not supplied	Aliphatics/Aromatics, BTEX, Naphthalene, PAH FID
869966	TP2 0.20 SOIL		PT 1L	Sample date not supplied	Naphthalene, PAH FID
869967	TP3 0.30 SOIL		PT 1L	Sample date not supplied	Aliphatics/Aromatics, BTEX, Naphthalene, PAH FID
869968	TP4 0.30 SOIL		PT 1L	Sample date not supplied	Aliphatics/Aromatics, BTEX, Naphthalene, PAH FID
869969	TP5 0.30 SOIL		PT 1L	Sample date not supplied	
869970	TP6 0.30 SOIL		PT 1L	Sample date not supplied	Naphthalene, PAH FID
869971	TP7 0.30 SOIL		PT 1L	Sample date not supplied	Aliphatics/Aromatics, BTEX, Naphthalene, PAH FID
869972	TP8 0.20 SOIL		PT 1L	Sample date not supplied	
869973	TP9 0.20 SOIL		PT 1L	Sample date not supplied	Naphthalene, PAH FID
869974	TP10 0.20 SOIL		PT 1L	Sample date not supplied	Aliphatics/Aromatics, BTEX, Naphthalene, PAH FID
869975	TP11 0.40 SOIL		PT 1L	Sample date not supplied	
869976	TP12 0.30 SOIL		PT 1L	Sample date not supplied	
869977	TP4 0.30 LEACHATE		PT 1L	Sample date not supplied	
869978	TP10 0.20 LEACHATE		PT 1L	Sample date not supplied	

Key: P-Plastic 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 and/or inappropriate containers 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