Shoalhaven City Council
C/- Set Consulting Pty Ltd

Geotechnical Assessment- Lot 1, DP1021332 and Lot 458, DP1063107 George Evans Rd, Mundamia, NSW



P0102863JR02V01 December 2012



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Contents

1 OVERVIEW	6
1.1 Assessment Overview	6
1.2 Development Proposal	6
2 SITE DESCRIPTION	7
2.1 Location and Existing Landuse	7
2.2 Topography and Drainage	8
2.3 Groundwater	8
2.4 Geology and Soil Landscapes	8
3 GEOTECHNICAL ASSESSMENT	9
3.1 Field Investigations	9
3.2 Subsurface Conditions	9
3.3 Soil Stockpiles	10
3.4 Soil and Rock Strength Properties	10
3.5 Preliminary Foundation Classification	11
3.6 Slope Stability	12
3.7 Laboratory Analytical Results	12
3.7.1 Particle size distribution	12
3.7.2 Atterberg Limits	12
3.7.3 Emerson aggregate class	12
3.8 Acid Sulfate Assessment	13
3.8.1 Acid Sulfate Mapping	13
3.8.2 pH screening	13
3.8.3 sPOCUS Analysis	14
3.8.4 Acid Sulfate Soil Discussion	16
3.9 Soil Aggressivity and Salinity	16
3.10 CBR Testing	17
4 DISCUSSION	18
4.1 Geotechnical Constraints	18
4.2 Adequacy	19
5 GENERAL RECOMMENDATIONS	20
6 REFERENCES	22
7 ATTACHMENT A – SITE TESTING PLANS	23



8	ATTACHMENT B – TEST PIT / BOREHOLE LOGS	.24
9	ATTACHMENT C - LABORATORY ANALYTICAL CERTIFICATES	. 25
10	ATTACHMENT – D DCP N COUNTS	.26
11	ATTACHMENT F - NOTES ABOUT THIS REPORT	27



1 Overview

1.1 Assessment Overview

Martens & Associates Pty Ltd (MA) have been commissioned to carry out a geotechnical assessment to support the subdivision of Lot 1, DP1021332 and Lot 458, DP1063107 (the 'site').

The purpose of this assessment is to investigate the site's geotechnical features, constraints and any possible geotechnical risk involved with future development plans (subdivision for residential purposes).

1.2 Development Proposal

At the time of reporting, the following details regarding components of the development proposal were available:

- o Proposed subdivision into residential allotments.
- o Internal road network with associated stormwater drainage.
- o Sewerage, water, power and gas infrastructure to service the development.



2 Site Description

2.1 Location and Existing Landuse

The 15.5ha (approx.) site is located at George Evans Road, Mundamia within the Shoalhaven Local Government Area (LGA) and is surrounded by predominantly underdeveloped bushland and rural land (Figure 1).



Figure 1: Site location

The site consists of a large area of disturbed land (towards the centre) primarily as the result of its past use as a quarry / gravel pit.



2.2 Topography and Drainage

Previous site use as a quarry / gravel pit has reshaped the natural site surface. The site falls to its centre which consists of a flat (slopes <5%) exposed sandstone surface. Drainage is facilitated by a manmade channel that runs north and exits the site under Jonsson Rd.

2.3 Groundwater

Site groundwater conditions are described as follows:

- o Groundwater was observed in one test pit (TP108) and moist soil conditions reported in test pits located in the site's south.
- o All other boreholes and test pits provided no indication of groundwater prior to termination depth.

A hydrogelocial assessment for the Mundamia urban release area was completed by Martens and Associates in February 2011 (Martens ref: P1002761JR01V02). Two groundwater monitoring wells GMB2 (south) and GMB4 (north) were installed on the site as part of this study (Figure 2). The following is summarised from the 4 month well monitoring period:

- o GMB2 was saturated above the soil/rock interface for the whole of the monitoring perid.
- o GMB4 remained dry above the soil/rock interface throughout the whole of the monitoring period. This is expected given that the silty gravely layer above the rock is considered to be highly permeable.

Given the site geological characteristics, ephemeral (temporary) groundwater is likely to occur in regions of the site's south in less permeable soils (sandy clay fill). A shallow (<2m) permanent groundwater table is not expected on site.

2.4 Geology and Soil Landscapes

Geological survey of NSW geology sheet (Wollongong 5609) maps the site being underlain by Nowra Sandstone, a subgroup of the Megalong Conglomerate Group geology.



3 Geotechnical Assessment

3.1 Field Investigations

Site inspection undertaken on 19 - 20 September 2012 included the following:

- General walkover inspection of site and nearby areas to review local geology, topography and vegetation.
- Excavation of fourteen boreholes using a truck mounted hydraulic drilling rig and hand auger to determine the nature of subsurface materials.
- o Excavation of thirteen test pits using backhoe.
- Excavation of thirteen boreholes / test pits with the use of a hand auger and spade
- Collection of 32 soils samples for Atterberg Limits, Shrinkage Index, pH, emersion aggregate class, particle size distribution, CBR analysis and soil agresstivity.

Location of sub-surface investigations are documented on the site plan provided in Attachment A

3.2 Subsurface Conditions

Subsurface conditions have been divided into geotechnical land units (Table 1). Due to the size of the site and scope of investigation, division into geotechnical units is broad and variability exists within units. A plan outlining each units is available in Attachment A.

Table 1: Geotechnical land units

Unit	Relevant BH/TP/SS	Description
1	TP102 - TP105, TP108, TP111, TP112, TP113, BH116, BH120, BH138	Surface fill (0.0 – 2.3) - clay, silty and sandy clay with inclusions: Builders rubble, concrete, timber, steel, PVC pipe, fibrous sheeting, glass.
2	BH115, SS114, SS119, SS122, TP123	Predominantly exposed sandstone from previous quarrying and soil stripping. <20% of the area contains shallow silty sand topsoil.



Unit	Relevant BH/TP/SS	Description
3	BH101, BH106, BH107, BH109, BH110, TP117, TP118, TP124, TP125, TP126 – TP128, BH129, BH130, TP131, BH132, BH133, TP134, TP137	Natural soil profile - Clayey gravely sands and sandy clays overlaying weathered sandstone. Stiff clays encountered in the site's south (BH101 and BH106). Depth to weathered sandstone is variable across the unit from 0.4 - 1.1 m.

3.3 Soil Stockpiles

Four soil stockpiles were identified during site investigations and are summarised in Table 2. Stockpile locations are highlighted on site testing plan in Attachment A

Table 2: Site stockpiles

Stockpile Description	Associated BH / TP	Material Description
Likely imported material from unknown origin.	TP111, TP112, TP113, BH120, BH138	Silty clay / sand inclusions: Building rubble, PVC pipe, glass, concrete, sandstone gravel.
Likely derived from site natural soil material as a result of excavation or site regrading.	TP134, TP136, TP137	Gravely clayey sands overlaying weathered sandstone

3.4 Soil and Rock Strength Properties

Soil and rock strength properties have been estimated based on borehole derived soil profile data, *in-situ* DCP testing results and auger refusal characteristics (Table 3 and Table 4). Methods are approximate and preliminary. Should further details or higher bearing pressures be required for foundation design purposes, additional testing is required.



Table 3: Preliminary depth to 100kPa strata

Geotechnical land unit	Approximate depth (m) to 100kPa allowable bearing pressure 1
1	NA ²
2	0.1 - 0.3 3
3	0.2 - 0.8

- ¹ Depth based on DCP 'N' counts and borehole logs.
- ² No bearing pressure allowed for fill. See Section 4.
- ³ Surface sandstone present in land unit.

Table 4: Preliminary rock strength properties.

Material description 1	<i>D_d</i> ² (kN/m³)	φ ³ (°)	ABC ⁴ (kPa)
Extremely Weak Sandstone	19	30	150
Weak Sandstone	22	32	400
Weak to Medium Strong Sandstone	24	34	750

Notes:

- ¹ Depth of material and detailed description is available in BH / TP logs available in Attachment B.
- ² In situ Unit Weight.
- ³ Estimate of effective friction angle ± 3°.
- ⁴ Allowable End Bearing Capacity based on Df/B ration <1.5

3.5 Preliminary Foundation Classification

Table 5 outlines the foundation classification for the various geotechnical units. Due to the size and variable nature that exists within the land units, these classifications are considered preliminary in nature.

Table 5: Preliminary foundation classification.

Geotechnical land unit	Classification ¹
1	Class P
2	Class A
3	Class A - Where depth to rock is <1m Class S - Where depth to rock is >1m
	Class H1- Site areas that contain natural stiff clays (BH101 and BH106).



¹ Classification based on AS2870 Residential slab and footing (2011)

3.6 Slope Stability

Based on site grades and underlying geology, slope stability is not considered to be a geotechnical constraint for the site. No sign of recent or relic mass movement on site were noted during the onsite investigation. Stability modelling was not part of the scope for this assessment.

3.7 Laboratory Analytical Results

3.7.1 Particle size distribution

Particle size distribution was conducted on two samples from geotechnical land unit 3 (2863/117/1.0 and 2863/118/0.3). Testing confirmed soil classification of 'SC' based on the Unified Classification System for both samples.

3.7.2 Atterberg Limits

Soil samples from two boreholes containing site natural clays were tested for Atterberg Limits to determine shrink swell potential with varied moisture levels (Table 6).

Table 6: Atterberg Limit laboratory data.

Sample ID ¹	Liquid Limit (%)	Rating ²	Plasticity Index (%)	Rating ³
2863/101/0.25	65	High	40	High
2863/106/0.4	65	High	40	High

Notes

Atterberg test indicate a range of high shrink swell potential in site natural clays.

3.7.3 Emerson aggregate class

Soil samples from four boreholes across the site were tested for soil erodibility to determine the level of sediment erosion in urban areas (Table 7).



¹ Project#/Borehole#/Depth(m).

² Based on Table 3.5 of Interpreting Soil Test Results (2007) – Ratings for compressibility and shrink-swell potential based on liquid limit.

³ Based on Table 3.4 of Interpreting Soil Test Results (2007) – Ratings for compressibility and shrink-swell potential based on plasticity index.

Table 7: Emerson aggregate class laboratory data.

Sample ID ¹	Emerson Aggregate Class	Sediment Export Factor ²
2863/103/0.4	4	Moderate
2863/109/0.05	8	Low
2863/118/1.0	4	Moderate
2863/128/0.2-0.3	4	Moderate

Emerson aggregate class results indicate a low to moderate potential for erodibility across the site.

3.8 Acid Sulfate Assessment

3.8.1 Acid Sulfate Mapping

A review of Shoalhaven City Council acid sulfate soils (ASS) mapping indicates that the site is classified as 'No known occurrence' of ASS.

3.8.2 pH screening

Fifteen soil samples were screened using field and oxidised pH (Table 8).

Table 8: pH and pH ox testing

Sample ID	рН	рН ох
2863/103/0.4	5.4	3.7
2863/105/0.2	5.0	2.9
2863/105/0.6	4.8	3.0
2863/SS114	6.9	3.8
2863/115/0.05	4.9	3.4
2863/117/0.05	5.1	2.6
2863/117/0.3	5.7	3.7
2863/117/1.0	5.2	4.0
2863/123/0.1	5.3	3.3
2863/125/0.05	4.7	2.1
2863/128/0.05	5.7	3.7
2863/129/0.05	4.5	2.0
2863/129/0.2	5.5	3.5
2863/133/0.05	5.2	1.9



¹ Project#/Borehole#/Depth(m)

² Based on Table 4.6 of Interpreting Soil Test Results (2007). - Sediment export risk levels derived from USCS classification and emersion class.

Sample ID	рН	рН ох
2863/134/0.2	4.7	2.7

Initial pH results indicated a potential for ASS on site and additional laboratory analysis was undertaken.

3.8.3 sPOCUS Analysis

sPOCUS analysis was undertaken on all fifteen samples and results are presented in Table 9.



Table 9: sPOCUS analysis

Sample ID	Testing Location	Sample Depth (m)	Soil Type	рНксь1	pH _{ox²}	TPA (mol H+/t) ³	TSA (mol H+/t) ⁴	S _{POS} (%S oxidisable) ⁵
2863/103/0.4	103	0.4	Fill - clay	4.3	3.6	32	<5	0.03
2863/105/0.2	105	0.2	Fill- clayey silt	4.2	3.7	140	87	0.06
2863/105/0.6	105	0.6	Clayey sand	3.9	3.6	55	<5	0.006
2863/SS114	114	0.05	Silty Sand	6.7	3.6	<5	<5	0.04
2863/115/0.05	115	0.05	Sandy clay	4.3	3.3	32	7	0.03
2863/117/0.05	117	0.05	Silty sand	4.3	2.7	180	140	0.02
2863/117/0.3	117	0.3	Clayey sand	4.5	3.8	12	<5	0.01
2863/117/1.0	117	1.0	Sandy clay	4.2	3.9	47	<5	0.04
2863/123/0.1	123	0.1	Sand	4.3	4.0	12	<5	<0.005
2863/125/0.05	125	0.05	Silty sand	4.4	3.0	100	65	0.01
2863/128/0.05	128	0.05	Silty sand	4.6	3.7	7	<5	0.006
2863/129/0.05	129	0.05	Silty sand	3.8	2.5	260	220	0.009
2863/129/0.2	129	0.2	Silty sand	4.8	3.6	<5	<5	0.007
2863/133/0.05	133	0.05	Gravely sand	4.1	2.5	300	260	0.03
2863/134/0.2	134	0.2	Gravely sand	3.8	3.0	120	87	0.007
Guideline			Course Texture	-	-	18	18	0.03
(Action Crit	teria)		Medium Texture	-	-	36	18	0.06

- ¹ Actual pH; ² Post peroxide oxidation pH;
- ³ Total Potential Acidity;
- ⁴ Total Sulfidic Acidity;
- ⁵ Percentage oxidisable sulfur.



3.8.4 Acid Sulfate Soil Discussion

Laboratory results indicate that levels are above the Acid Sulfate Soils Management Advisory Committee (ASSMAC) guidelines (bolded in Table 9) and as a condition of consent, an ASS management plan should be prepared. Location of samples above the ASSMAC guidelines are distributed widely across the site in both natural and fill horizons with no identified pattern of distribution. Given the sites location and residual soil landscape on rock, the origin of soil potential acidity is likely the underlying geology.

3.9 Soil Aggressivity and Salinity

Test of soil salinity levels and aggressivity to buried structural elements is summarised in Table 10.

Table 10: Soil salinity and aggressivity

			,	,,						
Sample ID	Sample Depth	Description	SO ₄ ¹ (mg/kg)	Cl ² (mg/kg)	рН3	EC (dS/m)	ECe (dS/m)	Salinity Level ⁴	Aggressivity Level ⁵	Exposure Rating ⁶
2863/117/1.0	1.0	Sandy clay	32	40	4.8	0.029	0.25	Non saline	Non aggressive	A1
2863/103/0.4	0.4	Fill- clay	53	49	5.5	0.051	0.44	Non saline	Non aggressive	A1
2863/125/0.05	0.05	Silty sand	24	45	4.8	0.040	0.92	Non saline	Non aggressive	A1
2863/118/0.3	0.3	Clayey sand	21	28	5.3	0.018	0.15	Non saline	Non aggressive	A1
2863/128/0.3	0.3	Clayey sand	9	5	5.4	0.029	0.67	Non saline	Non aggressive	A1

Notes:



¹ Sulphate 1:5 soil:water

² Chloride 1:5 soil:water

³ pH 1:5 soil:water

⁴ Hazelton *et al.* (2007) Table 5.32.

⁵ AS2159 Pilling- Design and installation (2009)

⁶ AS3600 Concrete structures (2009)

3.10 CBR Testing

5 soil samples were collected for CBR testing to assess their performance as pavement subgrade materials (Table 11).

Table 11: CBR test results.

Borehole	Sample Depth (m)	Soil Description	CBR value
BH106	0.3 - 0.5	Clay	2
BH110	0.2 - 0.4	Clayeysand	12
BH117	0.2 - 0.5	Clayeysand	4.5
BH125	0.1 - 0.4	Sandy Clay	13
BH128	0.2 - 0.4	Clayey Sand	11

A preliminary design CBR value of 4.5 is recommended for site course grained material while a design value of 2 is recommended for site clays. Due to the low CBR value and high shrink swell potential (Section 3.4.2), site natural clays are not recommended for use as subgrade material.



4 Discussion

4.1 Geotechnical Constraints

A summary of potential geotechnical constraints is provided in Table 12.

Table 12: Geotechnical constraints

Potential Constraint	Discussion	Outcome / Recomendation
Shallow groundwater	 Monitoring (Section 2.3) indicates that no shallow(<2m) permanent ground water table exists. A temporary groundwater table between the soil and rock interface is likely to be encountered. 	During construction works, measures to manage shallow intermittent groundwater are required.
Soil erosion	Emerson aggregate testing from samples across the site indicates a low to moderate potential for erodibility.	 Soil erosion controls have been outlined in Section 5 and should be implemented during the construction phase.
Acid sulfate soil	 Shoalhaven City Council mapping indicates 'No known occurrence' of ASS. Laboratory analysis found potential ASS. 	Acid sulfate management plan should be prepared



Potential Constraint	Discussion	Outcome / Recomendation
Salinity	 Soil aggressivity levels have been assessed against AS2159 Piling – Design and installation (2009) exposure rating criteria returning a nonaggressive rating. Salinity levels of samples analyses are classified as 'Non saline' 	 Preliminary site assessment indicates that salinity and aggressivity will not pose a problem for the development. Should development design call for deep pilling, further laboratory testing is recommend.
Onsite Fill	 Fill of unknown origin or quality identified on site (land unit 1) 	 Preliminary assessment of this material indicates that this material is geotechnically unsuitable for reuse as engineered fill onsite. See MA ref: P1002863JR01V01 for contamination assessment.
Shallow Sandstone	 Exposed sandstone from previous quarrying activities. Variability of site natural soils 	 Site regrading shall be required to achieve a developable surface. Importation of material is likely to be required for this purpose. Where fill is imported or site regrading undertaken, works and material selection shall ensure that a profile hydrogeologically consistent with the existing natural profile is achieved. Design of the imported profile and final material specifications shall be undertaken by MA following preparation of project grading plan.

4.2 Adequacy

From a geotechnical perspective, it is considered that that the site is suitable for the proposed development, subject to the recommendations outlined in this report.



5 General Recommendations

General site geotechnical recommendations are summarised in Table 13.

Table 13: Geotechnical recommendations

Geotechnical Issue	Re	commendations
Earthworks	0	Identified contaminated materials in fill are to be separately stockpiled for treatment, site entombment or offsite disposal. Any material for off-site disposal is to be waste classified before removal.
	0	Natural soils and extremely weak to weak sandstone should be readily excavated using conventional earthmoving equipment.
	0	Higher strength sandstone shall most effectively be excavated using a hydraulic hammer. Where hydraulic hammer is proposed, within 20m of any structure, a vibration monitoring plan shall be prepared and implemented.
	0	Excavation of any bedrock to be inspected by a geotechnical engineer at 1.0 m depth increments.
	0	All excavation work should be completed with reference to the Code of Practice 'Excavation Work', Cat. No. 312 dated 31 March 2000 by Workcover.
	0	All site earthworks should be undertaken in accordance with AS3798.
	0	If the development requires the importation of fill, it is to be free from organic materials, other contaminants and deleterious substances and have a maximum particle size not exceeding 100 mm.
	0	Site soils from geotechnical land units 2 and 4 are considered most appropriate for reuse onsite as engineered fill however further compaction / CBR testing should be undertaken.
	0	Engineered fill should be placed in 150 - 200mm layers.
	0	Temporary (less than two weeks) batter of 1V:2H should be used when excavating soil material.
	0	Permanent soil/fill batters are to be 1V:3H.
	0	Permanent batters in very weak to weak sandstone to be not steeper than 1V:1H.
	0	Permanent batters in weak to medium strong sandstone to be not steeper than 8V:1H.



Geotechnical Issue	Recommendations									
Importation of Fill	Changes to the site soil profile through the importation of engineered fill and site regrading must be compatible with the proposed stormwater recharge system proposed in MA Hydrogeological report(MA ref: P1002761JR01V02 June 2011).									
	Specific material requirements and methodology to be confirmed by following preparation of grading plans.									
Groundwater	It is considered that the proposed development is unlikely to intercept a permanent groundwater table and dewatering is unlikely to be required. If ephemeral groundwater is collected at the soil/rock interface after periods of substantial or prolonged rainfall, sump and pump methods are considered to be appropriate for dewatering during construction All site discharges should be passed through a filter material prior to release off-site. Groundwater ingress should be monitored during excavation by a geotechnical engineer.									
Soil Erosion Control	Removal of soil overburden should be performed in a manner that reduces the risk of sedimentation occurring in the Council stormwater system and on neighbouring lands. All spoil on site should be properly controlled by erosion control measures to prevent transportation of sediments off-site. Appropriate soil erosion control methods in accordance with Landcom (2004) are required.									



6 References

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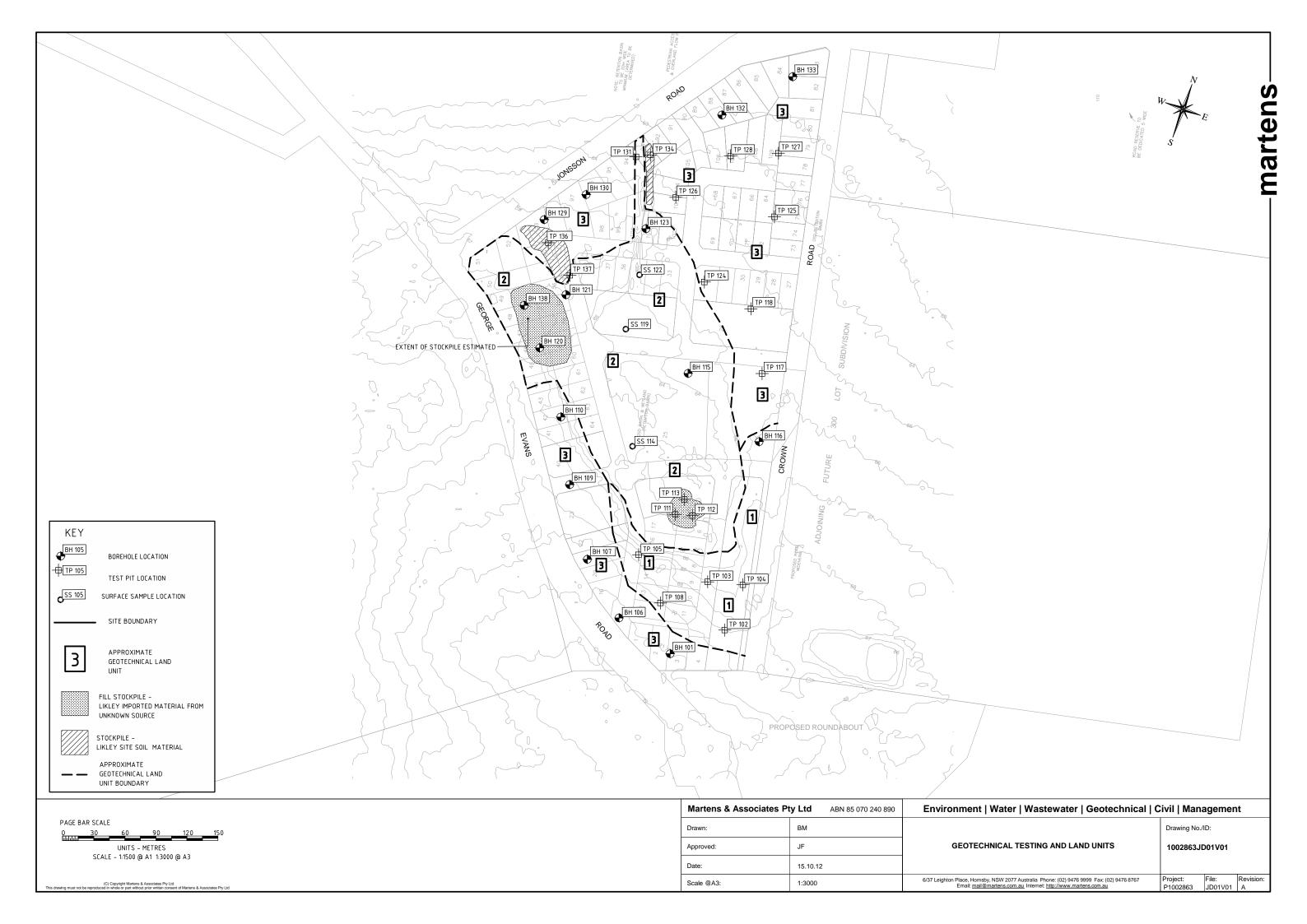
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7 Attachment A – Site Testing Plans





8 Attachment B – Test Pit / Borehole logs



			_			Council			COMMENCED	19.09.12	COMPLETED				—К	KEF	BH10'	1
PRO		СТ	+					ation Assessment	LOGGED	BM/JF	CHECKED	JF				eet 1 of		
SIT			Lo	t 1/DP1				DP1063107 George	GEOLOGY	Sandstone	VEGETATION				PR	OJECT NO.	P1002863	
EQUI					Truck mou		<u>/=</u>	vans Rd, Mundamia /	EASTING	NA	RL SURFACE							
				SIONS		5.5m depth			NORTHING	NA TA	ASPECT	North		041		OPE .	<5%	
	EXC	JAV	AII	ON DA			-	IVI A	ATERIAL DA	NIA .				SAIV	/IPLING	k IESIII	NG	
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	L PENETRATION H RESISTANCE	GRAPHIC LOG	CLASSIFICATION	Soil type, texture, structure, n particle characteristics, orga	PTION OF STR. nottling, colour, pla anics, secondary a ontamination, odou	sticity, rocks, oxidation, nd minor components,	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)				
٧	Nil	N	D	0.1		* * * *	SM	TOP SOIL - SILTY	SAND - Brow	n, with organics.		L	Α	0.05 2	2863/101/0.0	5		
V	Nil	N	D	- - -			CL	CLAY - Red, with	grey mottles	, low plasticity.	St		A B	0.25 2	2863/101/0.2 2863/101/0.2 2863/101/0.2	5		- - -
V	Nil	N	D	0.7			EW	EXTREMELY WEAK Clay like propertie					В		2863/101/0.7: 2863/101/1.0			- 1 <u>.0</u> -
V	Nil	N	D				w	WEAK SANDSTONE -	Brown/red, c	ourse grained sand.			В	1.5 2	2863/101/1.5			
v	Nil	N	D	3.0			EW	EXTREMELY WEAK Light gre	WEATHERE y, very easy d				_					- - - 3.0
٧	Nil	N	D	_ _ _ _ _ 3.8		PA	S	WEAK TO MED	DIUM STONG	- Brown/red.								
Borehole terminated at 3.8m on sandstone.										on sandstone.								4.0 4.0 - - - 4.5
N S BH A C V TC	Na Spa Bac Hai Aug Cor V-B	tural e ade ckhoe nd au ger ncrete sit	Corer	FHOD SI Ire SI St et RI Ni	UPPORT H Shoring C Shotcrete B Rock Bo il No suppe	lts <u>▼</u> Wat ort 	e obse measu er leve er outf	rved D Dry L Lo red M Moist M Mo. I W Wet H Hig Wp Plastic limit R Re low WI Liquid limit	ow VS oderate S gh F fufusal St VSt H	SISTENCY	ose A Auge B Bulk Dense U Undi D Distr se M Mois Ux Tube E Envir	NG & TES er sample sample sisturbed sa urbed sam sture conte e sample (x onmental s	ample ple nt x mm) sample	S S VS DCP	Pocket penetr Standard pen Vane shear Dynamic co penetromet Field density Water sample	etration test one er	CLASSIFICAT SYMBOLS AN SOIL DESCRII Y USCS N Agricultu	ION D PTION
						LACAVAIN	J. ₹ L\	CO TO DE IVEND IN CONJU		ASSOCIATES PTY LTD	OKT NOTES	וטא טיי		iOI	•			

	IEN	•												INEI IFIUZ)2
SIT	OJE	:C1							OP1063107 George	GEOLOGY	Sandstone		VEGETATIO	+	s			et 1 of	1 P1002863	
-	JIPME	NT		, .	Backh				ans Rd, Mundamia	EASTING	NA		RL SURFACI	_			1 100	0201 110.	F 1002803	
EXC	CAVA	ION I	DIMEN	SIONS	3.0m	X 1.0n	n X 1.9m			NORTHING	NA		ASPECT	North	1		SLOP	E	5%	
	EX	CA	VAT	ON DA					M.A	ATERIAL DA	ATA					SA	MPLING &	TESTIN	IG	
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	L PENETRATION	H RESISTANCE	GRAPHIC LOG	CLASSIFICATION	Soil type, texture, structure, re particle characteristics, orga	PTION OF STR nottling, colour, pl anics, secondary a ontamination, odo	asticity, rocks, and minor com	oxidation, ponents,	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)				
вн	BH Nil N D Cobbles									ayey silt, brown, with sandstone d boulders, some asphalt, te and clay inclusions.					E E	0.3	2863/102/ 0.5 2863/102/ 0.5			
вн	Nil	Z	D	1.0				xx	FILL - Mix of claye building and demol PE pipe, bricks, cc timber and other fibre o	ishing waste oncrete), sand	(steel, PV0 Istone boul , plastic ba	C pipe, ders,			E	1.5	2863/102/ 1.5 -	+ DUP2		1.0
E	QUIP	MEN	F/ME	2.0 3.0	SUPPOR		WATER			sandstone.	SISTENCY	DENSITY	SAMPI	LING & T	ESTING				CLASSIFIC	2.(3.(4.(4.1)
S Spade SC Shotcrete X Not measured M Moist M BH Backhoe bucket RB Rock Bolts \(\psi \) Water level W Wet H									ed M Moist M Mo W Wet H Hig Wp Plastic limit R Re w WI Liquid limit	oderate S gh F efusal St VSt H	Soft Firm Stiff	VL Very Loos L Loose MD Medium D D Dense VD Very Dens	B Bull Jense U Und D Dis Je M Moi Ux Tub	ger sample k sample disturbed turbed sa isture cor be sample ironmenta	sample ample ntent e (x mm)	S V: D:	p Pocket penetror Standard penetro S Vane shear CP Dynamic cone penetrometer D Field density /S Water sample	ration test	SYMBOLS SOIL DESC	AND CRIPTION
	C Tu	igster ish tub	i Carbi e	ue Bit																
\vdash			_			E	XCAVATIO	ON LO	G TO BE READ IN CONJU	INCTION WITH			ORT NOTES	AND A	BBRE'	VIATIO	ONS			

	IEN		_			y Counci		tion Accessor	LOGGED	19.09.12		HECKED	19.09.12	KEF IFIUS				13	
SI	OJE TF	L I	_					tion Assessment DP1063107 George	GEOLOGY	BM/JF Sandstone		EGETATION	JF Grass			Sheet 1 of PROJECT NO.			
-	JIPME	NT		, 51 1	Backhoe			ans Rd, Mundamia	EASTING	NA		L SURFACE	_			T NOOLOT NO.	F 1002863		
EXC	CAVAT	ION I	DIMEN	SIONS	3.0m X 1	.0m X 2.2m			NORTHING	NA	AS	SPECT	North			SLOPE	5-10%		
	EX	CA	/ATI	ON DA				M.A	ATERIAL DA	ATA					SAMPLIN	IG & TESTI	NG		
METHOD	SUPPORT	WATER	MOISTURE	ОЕРТН (М)	M PENETRATION H RESISTANCE	GRAPHIC LOG	CLASSIFICATION	Soil type, texture, structure, r particle characteristics, orga	PTION OF STR mottling, colour, pl anics, secondary a ontamination, odo	asticity, rocks, oxi and minor compor	dation, nents,	CONSISTENCY	DENSITY INDEX	TYPE	DEP IH (M)				
вн	Nil	N	D	- - - - - - - - 1.0			××	moist, soft to	CLAY LAYERS - Orange/brown, o firm, gravels and cobble lusions (10-20%).					E 0.		2863/103/ 0.25 CBR @ 1.0m			
вн	Nil	N	D				××	FILL - Mix of claye building and demol PE pipe, bricks, co timber and other fibre o	lishing waste oncrete), sand	(steel, PVC p dstone boulde , plastic bags	oipe, ers,			E 1	.2 2863/10	33/ 1.2 33/ 1.2 33/ 1.8 + DUP1	ment sheeting)	- - - - - - - - - - -	
			7 ME		UPPORT	WATER		MOISTURE PENE	strong sand	SISTENCY DE	ENSITY		NG & TES	TING			CLASSIFICA		
F C V	S Sp BH Ba HA Ha L AL CC Co / V-I	oade ackhoe and au uger ncrete Bit ngsten	Core	S et R N	H Shoring C Shotcre B Rock B il No sup	ete X Not	measur ter level ter outfl	ed M Moist M M W Wet H Hi Wp Plastic limit R Re w WI Liquid limit	oderate S gh F efusal St VSt H	Stiff D		se U Undis D Distu M Moist Ux Tube	er sample sample sturbed sa irbed samp ture conter sample (x conmental s	ole nt mm)	S Standard VS Vane sh DCP Dynan	nic cone ometer nsity	SYMBOLS A SOIL DESC Y USCS N Agricu	RIPTION	
Ë	ı Pü	ioi I IUD	ic .			EXCAVATI	ON LC	OG TO BE READ IN CONJU				T NOTES A	AND ABE	BREVIA	TIONS				
.1		_	-						MADTENS 0	ACCOCIATEC	DTVITD								

	IEN ⁻		_				Counci			COMMENCED 19.09.12 COMPLETED					\L						
-	OJE	СТ	_						ation Assessment	LOGGED	BM/JF		CHECKED JF					Sheet 1 o	-		
SIT	IPMEI		Lo	t 1/DP1	0213 Backh		and Lot		/DP1063107 George /ans Rd, Mundamia	GEOLOGY EASTING	Sandstone		VEGETATIO		3		Р	ROJECT NO.	P1002863		
-			DIMEN	SIONS	_		m X 1.0m	<u></u>	rano ita, manaanna j	NORTHING	NA NA		RL SURFACE ASPECT	NA North			SI	LOPE	5-10%		
				ON DA		, , , , ,			MA	ATERIAL DA			7.0. 20			SA		& TESTI			
МЕТНОБ	SUPPORT	WATER	MOISTURE	DEPTH (M)	L PENETRATION	H RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRI Soil type, texture, structure, i	PTION OF STR	ATA asticity, rocks	, oxidation, nponents,	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)					
				_											M M	0.1 0.2	2863/103/ A 2863/103/ A				
ВН	Nil	N	D	- - -				xx	FILL - Silty clay sandstone cobb treated pi fibre ceme		ers, orgar eel and				E	0.3	2863/103/ (
_	_			0.7		_ -									E	0.6	2863/103/ (. — — -		
BH	Nil	N	D D	0.95 1.0				SP	SAND - Brown gravel:	s (5-20mm, 2	0%).		+		В —	0.8	2863/103/ (- - 1 <u>.</u> 0	
									moist, c	layey sand te	kture.	/	1								
				_ _ _					Test pit terminate medium	d at 1.0m (bu n strong sands		al) on									
				-																	
				_																	
				_																	
				2.0																2 <u>.(</u>	
				-																	
				_																	
				_																	
				- -																	
				3.0																3.0	
				_																	
				_																	
				_																	
				_																	
4.0																				4.0	
				_																	
				-																	
N Natural exposure SH Shoring N None observed D Dry L										ow VS	SISTENCY Very Soft	DENSITY VL Very Loo		ING & Ti			p Pocket pene	etrometer	CLASSIFIC SYMBOLS	AND	
S B F	Sp H Ba A Ha	ade ckhoe nd au	buck	St Ri	C Sho B Roc il No s	tcrete k Bolt	X Not s <u>▼</u> Wat	measu ter leve	red M Moist M M el W Wet H Hi Wp Plastic limit R Re	oderate S igh F efusal St	Soft Firm Stiff	L Loose MD Medium D D Dense	B Bull Dense U Und D Dis	c sample disturbed turbed sa	sample mple	S VS	Standard per S Vane shear ICP Dynamic	enetration test	SOIL DESC	CRIPTION	
A C V	Au C Coi V-E	iger ncrete Bit	Core	r		• •	→ Wat		low WI Liquid limit	VSt H	Very Stiff Hard Friable	VD Very Dens	se M Moi Ux Tub	sture con e sample ronmenta	tent (x mm)	F	penetrome D Field densit /S Water samp	eter 'y	N Agric		
	C Tur T Pu	gsten		de Bit		-						ANIVING BED									
\vdash							.AUAVATI	ON L	OG TO BE READ IN CONJU	MARTENS &			OK I NOTES	AIND A	DDKE/	v IATI		_	_		

CL	LIENT Shoalhaven City Council								COMMENCED	19.09.12	COMPLETE	D 19.0	9.12			REF	TP105
-	OJE	СТ						ion Assessment	LOGGED	BM/JF	CHECKED	JF				Sheet 1 of	
SI			Lo	t 1/DP1		and Lot		OP1063107 George	GEOLOGY	Sandstone	VEGETATIO	_	ss			PROJECT NO.	P1002863
-	JIPME				Backhoe		LEV	ans Rd, Mundamia	EASTING	NA	RL SURFAC					0.05-	
EXC				SIONS ON DA		0m X 1.6m		MA	NORTHING	NA NA	ASPECT	Nort	th	٥,٨	MDIIN	SLOPE	5% NG
⊢	<u> </u>	CA	VAII	ON DA	_		z	IVIA	TI ERIAL DA	NIA				J	INIFLIN	IG & IESIII	NG .
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	L PENETRATION H RESISTANCE	GRAPHIC LOG	CLASSIFICATION	Soil type, texture, structure, n particle characteristics, orga	PTION OF STR nottling, colour, pla anics, secondary a entamination, odou	asticity, rocks, oxidation, and minor components,	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)			
ВН	Nil	N	М	-			xx	FILL - Organic clay	yey silt, grave ome plastic.	els, cobbles and			Е	0.2	2863/10	5/ 0.2	
вн	Nil	Z	М	0.5			sc	CLAYEY SAND some sandsto	- Grey/red m	ottles, moist, nd cobbles.			E	0.6	2863/10 2863/10		
				_ _ 1.6			-	Grades to extr	remely weak	sandstone.							
E P			F / ME		UPPORT H Shoring	WATER N Non		MOISTURE PENET	strong sands			LING & 1				enetrometer	2.4 3.6 4.1 CLASSIFICATION SYMBOLS AND
H () ()	BH Backhoe bucket RB Rock Bolts \(\frac{\text{V}}{A} \) Water level \(\frac{\text{W}}{A} \) Wet \(\frac{\text{H}}{A} \) Hand auger \(\frac{\text{Nil}}{A} \) No support \(\frac{\text{V}}{A} \) Water outflow \(\frac{\text{V}}{A} \) Using Plastic limit \(\frac{\text{R}}{A} \) Water outflow \(\frac{\text{V}}{A} \) Using Plastic limit \(\frac{\text{V}}{A} \) Water inflow \(\frac{\text{T}}{A} \) To Tungsten Carbide Bit								fusal St VSt H	Soft L Loose Firm MD Medium Stiff D Dense Very Stiff VD Very Den Hard Friable	Dense U Ui D Di nse M Mo Ux Tu	Ik sample disturbed sturbed s pisture co be sample vironmen	d sample ample intent le (x mm)	V: D: FI	Standard S Vane sh CP Dynam penetro D Field der /S Water sa	nic cone ometer nsity	SOIL DESCRIPTION Y USCS N Agricultural
F	T Pu	sh tub	e			EXCAVATI	ON LO	G TO BE READ IN CONJU	INCTION WITH	I ACCOMPANYING REF	PORT NOTE:	S AND A	ABBRE	VIATIO	ONS		

						Council			COMMENCED	19.09.12		OMPLETED	19.09.1	12			KEF	BH106	
PRO		СТ	+-					ation Assessment	LOGGED	BM/JF		HECKED	JF				Sheet 1		
SIT			Lo	t 1/DP1				/DP1063107 George /ans Rd, Mundamia /	GEOLOGY	Sandstone		EGET ATION	_				PROJECT NO	D. P1002863	
EQUI				SIONS	Truck mou	unted rig < 4.0m depth	<u></u>	ans Ru, Wundamia	EASTING NORTHING	NA NA		SPECT	NA North		—		SLOPE	<5%	
				ION DA		. 4.om depth		MA	TERIAL DA			SPECI	North		SAI		G & TEST		$\overline{}$
МЕТНОБ	SUPPORT	WATER	MOISTURE	DEPTH (M)	M PENETRATION H RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIF Soil type, texture, structure, rr particle characteristics, orga	PTION OF STR.	ATA sticity, rocks, oxiond minor compor	dation, nents,	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)	WI EIN	<u> </u>	ino	
٧	Nil	N	D	0.1		* * *	SM	TOP SOIL - SILTY	SAND - Brow	n, with organ	nics.			Α	0.05	2863/106/	0.05		
v	Nil	N	D	- - -			CL	CLAY - Red/bro	Grading to own, with oran	nge mottles,	-10%).			В	0.4- 0.5	2863/106/ CBR @ 0. 2863/106/ 2863/106/	.3m 0.4-0.5		-
v	Nil	N	D	0.85			. EW	EXTREMELY	gravels (10mg	DSTONE -				В	1.2	2863/106/	1.2		1.0 1.0 - - - - - 2.0
v	Nil	Ν	D	3.0			W	WEAK SANDS sand	STONE - Red. dstone gravels					В	3.0	2863/106/	3.0		3.0
				- - - <u>4</u> .5				Borehole terminated	d at 4.0m on v	veak sandsto	one.								- - 4.5
N S BH A C V TC	Na Spa Hai Au Au Cor V-B Tun	atural e ade ckhoe ind aug iger ncrete Bit	Corer	ure SH SC et RE Nil	JPPORT H Shoring C Shotcrete B Rock Bo I No suppre	te X Not in Dits \(\frac{\text{V}}{\text{V}} \) Wat \(\frac{\text{V}}{\text{V}} \) Wat	e obse measur ter leve ter outfl ter inflo	rved D Dry L Lor red M Moist M Mc II W Wet H Hig Wp Plastic limit R Rei low WI Liquid limit	w VS oderate S gh F ifusal St : VSt H F I	Very Soft VL Soft L Firm ME Stiff D Very Stiff VC Hard Friable ACCOMPAN	Loose Dense Dense Very Dense	A Auge B Bulk Ise U Undi D Distu M Mois Ux Tube E Envir	NG & TES er sample sample sturbed sam ture conte sample (onmental	ample nple ent (x mm) sample	PP S VS DC FD WS	S Vane sheat CP Dynamic penetror D Field dens S Water sar	penetration test ar c cone meter sity	CLASSIFICATIO SYMBOLS AND SOIL DESCRIPT Y USCS N Agricultural	ION

	EIN		_			/ Counci			COMMENCED	19.09.12		JWPLETED	19.09.1	12		h	KEF	В	H107	<i>'</i>
	OJE	СТ	_					ation Assessment	LOGGED	BM/JF		HECKED	JF				heet 1			
SIT			Lo	t 1/DP10				/DP1063107 George	GEOLOGY	Sandstone		GETATION		and shru	bs	Р	ROJECT NO	0. P10	02863	
	PME				Truck mou		<u>\=</u>	/ans Rd, Mundamia	EASTING	NA		SURFACE	NA					T		
				SIONS		2.8m depth			NORTHING	NA .	AS	SPECT	North				OPE	<5%		
	EX	CAN	AII	ION DAT		+	_	MI A	ATERIAL DA	NIA .			-		SAIN	IPLING	& TEST	ING		
МЕТНОD	SUPPORT	WATER	MOISTURE	DEPTH (M)	L PENETRATION H RESISTANCE	GRAPHIC LOG	CLASSIFICATION	Soil type, texture, structure, i particle characteristics, org	PTION OF STR. mottling, colour, pla janics, secondary a ontamination, odou	sticity, rocks, oxida nd minor componer	ition, nts,	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)					
V	Nil	N	□.	0.05	=		¥		- Brown, grave			_ + -	$-\mp$	<u>A</u>	0.05 2	<u>863/107</u> /0 <u>.</u>	.05			
٧	Nil	N	D				sc	CLAYEY SAND - Ora	gravels (5-30m ange/yellow, n avels (5-10mm	noist, fine grain	/ ned,			A	0.2 2	2863/107/0.	2			-
>	Nil	Ν	D	- 1.0 - 1.0 			MS		RONG SANE Red/brown.	DSTONE -						:863/107/ 1. :863/107/ 2.				1.0 1.0 2.0
>	Nil	N	D.	2.3		P A 19 P 1	MS	MEDIUM STRO	— — — - DNG SANDST quartzite grave					В	2.5 2		5			
				3.0				V-Bit refusal at 2.8n			ne.									3.0
N S BH A CO V TO	Na Sp H Ba A Ha Au C Cor V-E	itural of ade ckhoe nd au ger ncrete Bit gsten	Corer	THOD SU ure SH SC et RE Nil	JPPORT I Shoring C Shotcrete 3 Rock Bo I No suppo	te X Not bits \(\frac{\text{V}}{\text{V}} \) Wat \(\frac{\text{V}}{\text{V}} \) Wat	ne obse measu ter leve ter outf ter inflo	erved D Dry L Lo red M Moist M M el W Wet H Hi Wp Plastic limit R Re rlow WI Liquid limit	ow VS loderate S ligh F lefusal St VSt H F I	Very Soft VL Soft L Firm D Stiff D Very Stiff VD Hard Friable	Very Loose Loose Medium Dense Dense Very Dense	e U Undis D Distu M Moist Ux Tube E Enviro	r sample sample sturbed sa rbed sam sure conte sample (onmental	ample nple ent x mm) sample	S S VS V DCP FD F WS V	Vane shear Dynamic of penetrome Field density Water samp	enetration tes cone eter y	SYN	ASSIFICATION MBOLS AND L DESCRIP USCS Agricultur	ON D PTION
$\overline{}$			$\overline{}$							ASSOCIATES D										-

CLIENT Snoamaven City Council									COMMENCED			COMPLETE		. 12			KEF	T	P108	3
PR		СТ	+					tion Assessment	LOGGED	BM/JF		CHECKED	JF				Sheet 1			
SIT			Lot	: 1/DP1	_	and Lot		DP1063107 George ans Rd, Mundamia /	GEOLOGY	Sandstone		VEGETATIO	_	3			PROJECT I	NO . P1	1002863	
EQUI			NAC NI	SIONS	Backhoe 3.0m X 1.0	2m V 2 2m	<u> </u>	ans itu, wunuama /	EASTING NORTHING	NA NA		RL SURFAC	E NA North				SLOPE	5-10	0/	
				ON DA		JIII X 2.3III		MA	TERIAL D			ASPECT	NOTUI		SΔ		3 & TES		70	
МЕТНОD	SUPPORT	WATER	MOISTURE	DЕРТН (M)	L PENETRATION H RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRII Soil type, texture, structure, n particle characteristics, orga	PTION OF STI	RATA lasticity, rocks and minor con	, oxidation, nponents,	CONSISTENCY	DENSITY INDEX	TYPE	DЕРТН (M)		<u> </u>			
ВН	Nil	z z	M M	- - - 1.5 - - - - 11.0			xx	FILL - Organic silty gravels, pieces pla	clay, brown of concrete (stic and stee	100-500m	nd and m),			E	1.0	2863/108 2863/108				1.0
		2.0 <u>-</u> Y	w	- - - - - 2.0 - -										Е	2.0	2863/108	/ 2.0			- - - - 2.0
FC	DI IIPM	MF NT			JPPORT	WATER			est pit collap	e to ground se.		SAMP	LING & TÍ	STING				C	LASSIFICAT	3.0
N S BH A C V T C	N Natural exposure SH Shoring N None observed D Dry L S Spade SC Shotcrete X Not measured M Moist N								w VS oderate S gh F fusal St	Very Soft Soft Firm Stiff Very Stiff Hard Friable	DENSITY VL Very Loose L Loose MD Medium Do D Dense VD Very Dense	se A Au B Bu ense U Ur D Di: e M Mo Ux Tu	LING & TE ger sample lk sample disturbed sturbed sa visture con be sample vironmenta	sample mple tent (x mm)	pp S VS D(Pocket pe Standard Vane she CP Dynami penetroi Field dens S Water sai	penetration to ar c cone meter sity	S'	YMBOLS AN OIL DESCRII ' USCS	D PTION
P1	Pus	n tube	е			EXCV/VT	20110	G TO BE READ IN CONJU	INCTION WIT		ANVING DED	ORT NOTE	S AND A	BBDE'	/IATI/	פוער				
						LAUAVAIN	JIN LU	O TO DE READ IN CONJU	MARTENS &			ON INCIES	Y CIND A	- NIC	- 1-X 1 IC	JNS •				

DDC		•							tion Accessor	LOGGED	19.09.12		CHECKED	JF	.09.12		KE		BH1	<i>)</i> 9
SITE	PROJECT Geotechnical and Contamination Assessment ITE Lot 1/DP1021332 and Lot 458/DP1063107 Georg								GEOLOGY	BM/JF Sandstone		VEGETATION	_	ess and sh	rubo	Sheet		1 P1002863		
EQUIF		NT.	LO	ו ועלו ו	Truck				ans Rd, Mundamia	EASTING	NA		RL SURFAC	_		iubs	PROJ	JECT NO.	P1002863	
			DIMEN	SIONS	_		.9m depth		,	NORTHING	NA		ASPECT		orth		SLOPE	<u> </u>	<5%	
	EXC	CAV	/AT	ON DA					MA	ATERIAL D	ATA		•			SA	MPLING &	TESTIN	G	
МЕТНОБ	SUPPORT	WATER	MOISTURE	DEPTH (M)	L PENETRATION	RESISTANCE	GRAPHIC LOG	CLASSIFICATION	Soil type, texture, structure, r particle characteristics, org	PTION OF STF mottling, colour, pl anics, secondary a ontamination, odo	asticity, rocks, o	oxidation, ponents,	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)				
٧	Nil	N	D	0.1			× × ×	SM	TOP SOIL - SILTY S	AND - Grave	ls (5-50mm	, 10%).			А	0.05	2863/109/0.05			
v	Nil	N	D	0.4				SP	GRAVELL\ gravels	Y SAND - Lig (5-50mm, 10-	ht brown, 20%).				A	0.2	2863/109/ 0.2			- - -
v	Nil	N	D	_ _ _ _ _			P 81	MS	MEDIUM STRONG grading to d	G SANDSTO dark brown w		prown			В	0.6	2863/109/0.6			
		0.9							V-Bit refusal	at 0.9m on s	andstone.									1.0
	- - - - 4.5																			4.0
N Natural exposure SH Shoring N None observed D Dry L										ow VS oderate S igh F efusal St VSt H F	Very Soft Soft Firm Stiff Very Stiff Hard Friable	DENSITY VL Very Loo: L Loose MD Medium D D Dense VD Very Dens	se A Ai B Bi Dense U U D D se M M Ux Ti E Er	iger san ilk samp ndisturb sturbed bisture o ibe sam vironme	ole ed sample I sample content ople (x mm) ental sampl	PI S V: D FI e W	p Pocket penetrom Standard penetra S Vane shear CP Dynamic cone penetrometer D Field density /S Water sample	ation test	CLASSIFIC SYMBOLS SOIL DESC Y USCS N Agrict	AND CRIPTION

CLII						Counci			COMMENCED	19.09.12		JWPLETED	19.09.1				KEF	В	H110)
PRC		СТ	+					tion Assessment	LOGGED	BM/JF	CF	HECKED	JF				Sheet 1	of 1		
SITI			Lo	: 1/DP1				DP1063107 George rans Rd, Mundamia /	GEOLOGY	Sandstone		GETATION		ınd shut	os		PROJECT N	IO. P10	02863	
EQUI			NAC NO	210110	Truck moi		<u> </u>	alis Ku, Wiuliualilia	EASTING	NA		SURFACE	NA				N ODE	F0/		
				ON DA		2.6m depth			NORTHING	NA TA	AS	SPECT	North		CAI		SLOPE & TEST	<5%		
	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION R RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRII Soil type, texture, structure, n particle characteristics, orga	PTION OF STR	ATA asticity, rocks, oxida and minor compone	ation,	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)	WIFLING	o a les	TING		
٧	Nil	N	D	0.1		× × ×	SM	TOP SOIL - SILTY SA	AND - Gravel	s (5-50mm, 1	0%).			Α	0.05	2863/110/0	0.05			
V	Nil	N	D	- - - - - - - 11.0			SP SP	GRAVELLY gravels (/ SAND - Ligt 5-50mm, 10-2	nt brown, 20%).						2863/110/u CBR10 @	0.2-0.4m			
v	Nil .	N N	D	- 1.6			MS	MEDIUM STRONG S	SANDSTONE stone inclusion		rown,			В	1.8	2863/110/				- - - - - 2.0
V	Nil	N	D	- - - 2.6			MS	MEDIUM ST	FRONG SANI	DSTONE				В	2.4	2863/110/2	2.4			-
								V-Bit refusal at		dium strong										
				- - - 3.0 - - - - - - - - - - - - - - - - - - -					sandstone.	aum on ong										3.0
EΩ	UIPN	ЛENT	/ MET	4.5 HOD S	UPPORT	WATER		MOISTURE PENET	TRATION CON	SISTENCY DEN	NSITY	SAMPLIN	IG & TES	STING				CI A	ASSIFICATION	4. <u>5</u>
N S BH HA A CC V TC	Na Spa Bac Hai Au Cor V-B	tural e ade ckhoe nd au ger ncrete sit	bucke ger Corer	re S S t R N	H Shoring C Shotcret B Rock Bo il No supp	N Nor e X Not oft	e obse measu ter leve ter outf ter inflo	rved D Dry L Lo red M Moist M M I W Wet H Hig Wp Plastic limit R Re low WI Liquid limit	w VS oderate S Jh F fusal St VSt H F I	Very Soft VL Soft L Firm MD Stiff D Very Stiff VD Hard Friable	Very Loose Loose Medium Densi Dense Very Dense	A Auge B Bulk s e U Undis D Distu M Moist Ux Tube E Enviro	r sample sample sturbed sa rbed sam ure conte sample (x	ample ple nt x mm) sample	S VS DC FD WS	Vane shea P Dynamic penetron Field dens S Water san	penetration tes ar cone neter ity	SYI	ASSIFICATION MBOLS AND LDESCRIP USCS Agricultur	D PTION

	Snoainaven City Council									COMME					COMPLE		9.09.12			KEF	•	TP1	11			
	PROJECT Geotechnical and Contamination Assessment SITE Lot 1/DP1021332 and Lot 458/DP1063107 George							LOGGE		BM/JF			CHECKE					Sheet '		1		1				
SIT			Lot	t 1/DP1	_		and Lot							Sandstone	9		VEGETAT	_	rass			PROJECT	T NO.	P1002863		4
EQUI					Backh			\Ev	ans ru	d, Mui	ndamia			NA			RL SURF					I	<u> </u>			4
				SIONS		X 1.0n	m X 0.8m				N.4	NORTH		NA N T A			ASPECT	N	orth			SLOPE		10%		4
	EX	JAV	AII	ON DA		\dashv		T			IVI	ATERIA	(L D)	AIA				٠.,	+-	_ 5 A	WIPLIN	G & TE	STING	<u>ز</u>		4
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	L PENETRATION	H RESISTANCE	GRAPHIC LOG	CLASSIFICATION	Soil ty parti	/pe, textur icle charac	e, structure, cteristics, or	IPTION O , mottling, co ganics, seco contaminatio	olour, pla ondary a	asticity, rock and minor co	s, oxidation	on, s,	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)						
ВН	Nil	N				Iα		C XX	org	ganics,	some sa	d, orange ndstone of ed at 0.8r n strong	m (bu	es and bo	oulders		0	ā	E	0.25		est pit undert	taking into	o stockpile.	1.	
N	Na	atural e		ure S⊦	JPPOR 1 Sho	ring	WATER N None	e obser	rved D	DISTURE Dry	LI		VS	SISTENCY Very Soft	VL ۱	Very Loos	e A	Auger sa	& TESTING	pp	p Pocket p	enetrometer	r	CLASSIFIC	AND	
HA CC V TC	BH Backhoe bucket RB Rock Bolts \(\frac{\text{V}}{-} \) Water level \(\text{W} \) Wet H HA Hand auger \(\text{Nil} \) No support \(\frac{\text{V}}{-} \) Water level \(\text{W} \) Plastic limit \(\text{R} \)										H H limit R F		F St VSt H	Soft Firm Stiff Very Stiff Hard Friable	MD N	Loose Medium De Dense Very Dense	ense U D e M Ux	Disturbed Moisture Tube san	ed sample I sample) FI	Standard S Vane she ICP Dynam penetro D Field den I/S Water sa	nic cone ometer nsity) test	Y USC N Agri		
						Е	XCAVATIO	ON LC)G ТО В	E READ	IN CONJ	UNCTION	WITH	ACCOM	PANYIN	IG REPO	ORT NOT	ES AND	ABBRE	VIATIO	ONS					1
	_		_									MADTE	NC o	Vecociv.	TEO DT	VITD										┪

	= N I					_	Council					COMME					COMPLE		19.09.12			⊣KE⊦	-	TP11	2
PRO		СТ	_				d Contar					LOGGE		BM/JF			CHECKE		JF			Sheet		1	
SIT			Lot	i 1/DP1	_		and Lot							Sandstone			VEGETA	_	Grass			PROJEC	T NO.	P1002863	
	PMEN				+	khoe		<u></u>	ans ru	d, Iviui	ndamia			NA			RL SURF	-	NA			T.,			
				SIONS		n X 1.0	0m X 0.8m	—				NORTH		NA A T A			ASPECT	1	North		2484DLI	SLOPE		-10%	
Н	EX	JAV	AII	ON DAT			+	٦			iv	IATERIA	\L v	AIA				Т.	-	\dashv	SAMPLI	NG & TE	:51 INC	ف	
METHOD	SUPPORT	WATER	MOISTURE	DEРТН (M)	L DENIETRATIO	RESISTANCE	GRAPHIC LOG	CLASSIFICATION	Soil ty parti	/pe, textur icle charac	re, structure cteristics, o	RIPTION O , mottling, co rganics, seco contamination	olour, plandary a	asticity, rock	s, oxidation	on, s,	CONSISTENCY	DENSITY INDEX		TYPE	DEPTH (M)				
вн	Nil	Z	M	- - - -				XX XX	F	ILL - Si rubble	e (bricks	sandy cla PVC pipi c and gla	e, cor	ncrete), so	uilders ome					E		Test pit unde	rtaking into	o stockpile.	
									т	est pit t		ed at 0.8i m strong			sal) on										
				- - - -																					- - - -
				_ 2.0 _																					- 2.0 -
				- - -																					-
				- - -																					-
																									3 <u>.0</u> - -
				- - - -																					- - - -
				4.0 - - - - 4.5																					- 4.0 - - - 4.5
N S BH H A CO V TO	Na Spa H Bad A Har Aug C Con V-B C Tung	atural e ade ckhoe ind aug iger ncrete Bit	Corer	ure SH SC et RE Nil	B Ro		lts ل Wate	ne obser measur ter level ter outfl	rved D red M el W Wp low WI		L I M I H I limit R I	Moderate High	VS S F St VSt H	SISTENCY Very Soft Soft Firm Stiff Very Stiff Hard Friable	VL V L L MD N D D	ITY Very Loos Loose Medium De Dense Very Dense	e A B ense U D e M Ux	Auger s Bulk sar Undistu Disturbe Moisture Tube sa	6 & TEST cample mple irbed same ed sample e content ample (x mental sa	mple ile it mm)	S Standa VS Vane s DCP Dyna	amic cone trometer lensity		CLASSIFIC SYMBOLS SOIL DESC Y USCS N Agrico	AND RIPTION
Г	, us	ເປປ	_		_	F	EXCAVATION	ONIC	OG TO B	E READ	IN CON	JUNCTION	1 WITH	1 ACCOM	PANYIN	IG REPO	ORT NOT	ES AN	D ARP	REVI	ATIONS				
		_			—						55140			VeeOcivi						v 1/					

STE_	Description							ty Council			COMMENCED			OWPLETED	19.09.12			REF	TP11	3
EVANUATION DATA	County C			СТ	_						LOGGED	BM/JF		CHECKED	JF			1		
March Marc	Column C				Lot	: 1/DP1									_			PROJECT NO)- P1002863	
EXCENTION DATA	MATERIAL DATA SAMPLING & TESTING SAMPLING &								\EV	ans Ru, Mundanna					_			OL ODE	T 400/	
Part No.								.0m X 0.9m				II.	A	ASPECT	North		CAMPIIN			
BH NI IN M	FILL - Silty clap/daysy sand, brown, dry, minor builders rubble (broke) PVC pipe, concretely. Test pit terminated at 0 Sm (bucket refusal) on medium arong sandstone. Test pit terminated at 0 Sm (bucket refusal) on medium arong sandstone. Test pit terminated at 0 Sm (bucket refusal) on medium arong sandstone. Test pit terminated at 0 Sm (bucket refusal) on medium arong sandstone. Test pit terminated at 0 Sm (bucket refusal) on medium arong sandstone. Test pit terminated at 0 Sm (bucket refusal) on medium arong sandstone.						PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRI Soil type, texture, structure, r particle characteristics, org	PTION OF STR mottling, colour, pla panics, secondary a	RATA asticity, rocks, oxid and minor compon	lation, ents,	CONSISTENCY	DENSITY INDEX			<u> </u>	ing	
Rough Roug	Test pit serminated at 0.0m (publicker refusal) on medium strong sandstone. Test pit serminated at 0.0m (publicker refusal) on medium strong sandstone. 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2	ВН	Nil	N		- - - - -			X X X X X X	builders rubble ((bricks PVC p					E C).4 2863/11	2/ 0.4		
A.0 A.0 C.D.URMANT METHOD S. DRPCRT N Natural exposure S. Soade	EQUIPMENT ALTO SUPPORT WATER MOSTURE PENSITATION CONSISTENCY GEASTY N Natural exercision S Squade S Solvering S S												on							1.0 - - - - -
EQUIPMENT / METHOD SUPPORT Not neasured Not measured Not measured Halper CC Concrete Corer V V-Bit TC Tungsten Carbide Bit Not measured V V-Bit Tungsten Carbide Bit Not measured V V-Bit Tungsten Carbide Bit Not measured V V-Bit Tungsten Carbide Bit V-Bit	EQUIPMENT / METHOD N Natural exposure S Spade S Spade S B Backhoe bucket HA Hand auger A Auger C Concrete Corer V V-Bit TC Tungsten Carbide Bit PT Push tube Water large Water large Wat					- - - - - -														- 2.0
N Natural exposure S Spade S Spade S Spade S Spade S Shortrete S Standard penetration test S Stand	N Natural exposure SH Shoring S Spade S Shorter V None observed BH Backhoe bucket HA Hand auger HA Hand auger C C Concrete Corer V V-Bit T T Tugsten Carbide Bit PT Push tube N None observed D D Dry L Low VS Very Soft VL Very Loose B Bulk sample S Sandard penetration test S Standard penetration test VS Vare shear DCP Dynamic cone penetrometer C SYMBOLS AND SOIL DESCRIPTION When the standard penetration test S Standard penetration test VS Vare shear DCP Dynamic cone penetrometer C SYMBOLS AND SOIL DESCRIPTION When the standard penetration test VS Vare shear DCP Dynamic cone penetrometer SYMBOLS AND SOIL DESCRIPTION When the standard penetration test VS Vare shear DCP Dynamic cone penetrometer SYMBOLS AND SOIL DESCRIPTION When the standard penetration test VS Vare shear DCP Dynamic cone penetrometer SYMBOLS AND SOIL DESCRIPTION When the standard penetration test VS Vare shear DCP Dynamic cone penetrometer SYMBOLS AND SOIL DESCRIPTION When the standard penetration test VS Vare shear DCP Dynamic cone penetrometer SYMBOLS AND SOIL DESCRIPTION When the standard penetration test VS Vare shear DCP Dynamic cone penetrometer SYMBOLS AND SOIL DESCRIPTION When the standard penetration test VS Vare shear DCP Dynamic cone penetrometer SYMBOLS AND SOIL DESCRIPTION When the standard penetration test VS Vare shear DCP Dynamic cone penetrometer SYMBOLS AND SOIL DESCRIPTION When the standard penetration test VS Vare shear DCP Dynamic cone penetrometer SYMBOLS AND SOIL DESCRIPTION When the standard penetration test VS Vare shear DCP Dynamic cone penetrometer SYMBOLS AND SOIL DESCRIPTION When the standard penetration test VS Vare shear DCP Dynamic cone penetrometer SYMBOLS AND SOIL DESCRIPTION When the standard penetration test VS Vare shear DCP Dynamic cone penetrometer SYMBOLS AND SOIL DESCRIPTION When the standard penetration test VS Vare shear DCP Dynamic cone penetrometer SYMBOLS AND SOIL DESCRIPTION When the standar																			
FT Fushitude	EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS	N S BH HA A CO V TO	Na Spa H Bad A Had Aud C Cor V-B C Tun	atural e bade ickhoe ind aug iger ncrete Bit igsten	exposu e bucke ger Corer Carbic	re SH SC t RE Nil	H Shoring C Shotcre B Rock B	g N Nonete X Not Bolts y Wat	ne obser measur iter level	erved D Dry L Lo red M Moist M M el W Wet H Hi Wp Plastic limit R Ref flow WI Liquid limit	ow VS loderate S igh F efusal St VSt H	Very Soft VL Soft L Firm MD Stiff D Very Stiff VD Hard VL	Very Loose Loose Medium Den Dense	A Auge B Bulk: nse U Undi: D Distu M Moist Ux Tube	er sample sample sturbed sa urbed samp ture content sample (x	ample ple nt x mm)	S Standard VS Vane sh DCP Dynam penetro FD Field der	d penetration test ear nic cone ometer nsity	SYMBOLS A SOIL DESCI	AND RIPTION
	MADTENIC & ACCOCIATES DIVITO							EXCAVATION	ON LC	OG TO BE READ IN CONJU				RT NOTES A	AND ABE	3REVIA	ATIONS			

							Council					COMME		19.09.12			COMPLET		19.09.1				KEF		BH1	15
PRO		СТ	+							Assessmen		LOGGED		BM/JF			CHECKE		JF				Sheet 1		1	
SIT			Lo)63107 Geo Rd, Mundar		GEOLOG		Sandstone			VEGETAT	_					PROJECT	NO.	P1002863	
EQUI			IMENI	SIONS		d Auger	0.3m depth	<u></u>	<u>ans n</u>	tu, munuai	iiia /	EASTING NORTHI		NA NA			RL SURFA	_	NA North				SLOPE	Т.	5%	
				ON DAT		IIII X C	J.Sm depth				МА	TERIA					ASPECT		NOTUT		SVI		G & TE			
МЕТНОБ	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION	H RESISTANCE	GRAPHIC LOG	CLASSIFICATION	Soi' pe	DE il type, texture, stru article characteristi	ESCRIF ucture, n	PTION OF	F STR. our, pla	ATA sticity, rocks	s, oxidati mponent	on, ss,	CONSISTENCY	DENSITY INDEX			DEPTH (M)	ni Liivo	<u> </u>	31114	<u> </u>	
НА	Nil	N	М					CL		SAI	NDY (CLAY - L	ight l	orown.					\neg	Α (0.05	2863/115/	0.05			_
HA	Nil	N	М	0.15 - 0.3		_ -	P1 . 4	w		EAK, EXTRE	MELY		HERE	 ED SAND	STON	NE -		_	- +	- A	0.2	2863/115/	0.2	_		
										Borehole to																
EC N		ΛΕΝΤ itural e		HOD SU	JPPOI I Sho		WATER N None			MOISTURE D Dry	PENET L Lo	ration w		SISTENCY Very Soft	DENS VL	SITY Very Loos	SAM e A	APLING Auger s	& TES	STING	pp	Pocket pe	netrometer		CLASSIFIC SYMBOLS	ATION AND
S BH	Spa	ade ckhoe		SC	Sho	otcrete ick Bolts	X Not		red N		M Mo	oderate	S	Soft Firm	L I	very Loos Loose Medium De	B I	Augers Bulk sar Undistu	mple		S	Standard Vane she	penetration	test	SOIL DESC	
HA	Har	nd aug	ger			suppor	rt 		V	Np Plastic limit			St :	Stiff	D [Dense	D	Disturb	ed sam	nple		P Dynami	c cone		Y USC	S
		ncrete	Corer				→ Wat			NI Liquid limit			H	Very Stiff Hard	VD \	ery Dense	Ux ⁻	Moistur Tube sa	ample (x mm)		penetror Field dens	sity		N Agric	ultural
TC		gsten		de Bit			→ Wat	er inflo	w				F	-riable			E E	nviron	nental	sample	WS	Water sar	nple			
PT	Pus	sh tube	9		—		YC 4\/4T'	ON 1.)G TO	BE READ IN C	2001 11	INCTION	\\/!\	ACCON4	O A N I N / IA	IC PEDO	אסד אוסדי	EC AN	D 40	BDE\"	ΙΛΤΙΟ	NS				
	—		_		—		ACAVAII	JIN LC	טו טر	DE VEND IN (JUNJU			ACCOME			ווטאו זאל	اA دن	D AB	ארבען	MIN	NO				

PROJECT Geotechnical and Contamination Assessment LogGED BM/JF CHECKED JF SITE Lot 1/DP1021332 and Lot 458/DP1063107 George GEOLOGY Sandstone VEGETATION Trees													12			KEF	BH1	16		
-		<u> </u>	_							-				+	and shr	rubs		Sheet 1 o		
-	JIPME	NT			_	nd Au			ans Rd, Mundamia	EASTING	NA		RL SURFACE	_			——————————————————————————————————————		. 7002003	
EXC				ISIONS		5mm :	X 0.5m depth			NORTHING	NA		ASPECT	North				LOPE	<5%	
L	EX	CA	VAT	ION DA					MA	ATERIAL DA	ATA					SA	MPLING	& TESTI	NG	
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	, , , , , , , , , , , , , , , , , , ,	RESISTANCE	GRAPHIC LOG	CLASSIFICATION	Soil type, texture, structure, r particle characteristics, org	PTION OF STR mottling, colour, pl anics, secondary a ontamination, odo	asticity, rocks, and minor com	oxidation, ponents,	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)				
НА	Nil	N	D	0.2				xx	FILL - Gravelly claye gravels	ey sand, brow inclusion (5-	n, with blu 10%).	e metal			A A A	0.05 0.15 0.2		.15		
НА	Nil	N	М	_ _ 0.5			P	EW	EXTREMELY Orange	/ WEAK SAN and brown m		-								
				0.5					Borehole termina	ated at 0.5m	on sandsto	one.								1 <u>.</u>
E H	N N S S BH Ba HA Ha CC Cc V V-	atural cade ackhoe and au uger encrete Bit	expos e buck uger e Core	ure S S et R N	SUPP(SH Si SC Si RB R	horing hotcre ock B	ete X Not	ne obse measu ter leve	rved D Dry L Lo red M Moist M M I W Wet H Hi Wp Plastic limit R Re low WI Liquid limit	ow VS oderate S gh F efusal St VSt H	Very Soft Soft Firm Stiff	DENSITY VL Very Loose Loose MD Medium De D Dense VD Very Dense	se A Aug B Bulk ense U Und D Dist e M Mois Ux Tube	ING & TE er sample sample isturbed s urbed san et sample conmental	e ample nple ent (x mm)	pr S V: D	p Pocket pene Standard pe S Vane shear ICP Dynamic penetrom D Field densit VS Water sam	cone eter	CLASSIFIC SYMBOLS SOIL DESC	AND CRIPTION
F	PT Pu	ish tub	oe				EXCAVAT	ION LO	OG TO BE READ IN CONJU	JNCTION WITH			ORT NOTES	AND AE	BBRE\	VIATIO	ONS			

CL	IEN ⁻	Т	S	hoalha	ven	City	Council			COMMENCED	19.09.12	COMPLET	ED	19.09	12			REF	TP117
PR	OJE	СТ	G	eotech	nica	al and	l Contar	nina	tion Assessment	LOGGED	BM/JF	CHECKED	•	JF				Sheet 1	
SIT	Έ		Lo	t 1/DP1	021	332 a	and Lot		DP1063107 George	GEOLOGY	Sandstone	VEGETAT	ION	Trees	and shr	ubs		PROJECT N	NO. P1002863
EQU	IPME	NT			Bad	ckhoe		<u>Ev</u>	ans Rd, Mundamia	EASTING	NA	RL SURFA	ACE	NA					
EXC				SIONS	1	m X 1.0r	m X 2.3m			NORTHING	NA	ASPECT		North				SLOPE	5-10%
_	EX	CA	/AT	ON DA					MA	TERIAL DA	TA					SA	MPLIN	G & TES	TING
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)		M PENETRATION H RESISTANCE	GRAPHIC LOG	CLASSIFICATION	Soil type, texture, structure, m particle characteristics, orga	PTION OF STR. nottling, colour, pla anics, secondary a intamination, odou	sticity, rocks, oxidation, nd minor components,	CONSISTENCY	X LONG	DENSILY INDEX	TYPE	DEPTH (M)			
вн	Nil	N	D	0.1			× × ×	SM	ORGANIC SILTY	SAND - Brow	n, dry, rootlets.				Е	0.05	2863/117	7/ 0.05	
вн	Nil	N	D	-				sc	CLAYEY SAND - Ora		noist, fine grained,				В Е	0.2- 0.5 0.3	2863/117 CBR @ 0 2863/117	0.2-0.5m	- - - -
									- — — — — -						– <u>—</u> В	0.6	2863/117		
ВН	Nil	N	D	1.0 - -				CL	SANDY CLAY - Or	ongo/grow/roo	l mottles maist				E B	1.0	2863/117 2863/117		1.0 - - -
	Nii	N		- - -				OL	SANDT CLAT - OR	ange/grey/rec	mones, most.								- - - -
				2.0						Grades to									2.0
					П		P 14	_				T							
вн	Nil	N	D	2.3			, ,	EW	EXTREMELY WEA	AK SANDSTO ginised gravel									
				- - -					Test pit terminated medium	d at 2.3m (bud strong sands									- - - -
				3.0															3 <u>.</u> - -
				- - -															- - - -
- 4.0 - - - - - 4.5																			4.0 - - -
E	<u> </u> QUIPI	L MEN1	/ / ME		UPPO	ORT	WATER		MOISTURE PENET	SISTENCY DENSITY	SAM	I IPLIN	G & TF	STING	Ш			4.5 CLASSIFICATION	
N S B H A C V	Na Sp H Ba A Ha Au C Coi V-E	atural bade ickhoe and au iger ncrete Bit ngster	expos e buck iger e Core	ure S S et R N	H SI C SI B R	horing hotcrete ock Bolts o suppor	N None X Not r S ♥ Wate Wate Wate	neasur er level er outflo	rved D Dry L Lor ed M Moist M Mc W Wet H Hig Wp Plastic limit R Ref ow WI Liquid limit	w VS oderate S gh F fusal St VSt H F	Very Soft VL Very Loss Soft L Loose Firm MD Medium Stiff D Dense Very Stiff VD Very De Hard Friable VD Very De	Donse A / B E Donse U I D I I I I I I I I	Auger Bulk si Undist Disturl Moistu Tube s	sample surbed s bed sai ire con sample nmenta	sample mple ent (x mm) I sample	pp S VS DC FE W	Standard Vane she DP Dynam penetro Field den S Water sa	ic cone meter sity	SYMBOLS AND

							d Contai		tion Assessment	LOGGED	BM/JF		CHECKED	_	.09.12			TP118
PRO		:U I	+-						DP1063107 George	GEOLOGY	Sandstone		VEGETATI		ees and sh	rubs	Sheet 1 PROJECT NO	of 1 D. P1002863
EQUI		NT			_	khoe			ans Rd, Mundamia	EASTING	NA		RL SURFA					
				SIONS		n X 1.0	0m X 1.1m			NORTHING	NA		ASPECT	No	orth		SLOPE	5-10%
П		CA		ON DA		 빙	9	NO.	M.A	ATERIAL D	ATA		≿				MPLING & TEST	ING
МЕТНОВ	SUPPORT	WATER	MOISTURE	DEPTH (M)	L DENETO AT	H RESISTANCE	GRAPHIC LOG	CLASSIFICATION	Soil type, texture, structure, r particle characteristics, orga	PTION OF STF mottling, colour, pl anics, secondary a ontamination, odo	asticity, rocks, or and minor comp	oxidation, ponents,	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)		
ВН	Nil	N	D	0.1	\blacksquare		* * * *	SM	ORGANIC SILTY	SAND - Brov	vn, dry, root	tlets.			E	0.05	2863/118/ 0.05	
вн	Nil	N	D	_ _ _ 				sc	CLAYEY SAND - Ora	ange/yellow, i avels (5-10mr	moist, fine (m, 5%). — — —	grained,			E B	0.3 0.3	2863/118/ 0.3 2863/118/ 0.3	
ВН	Nil	N	D	- -				CL	SANDY CLAY - Or	range/grey/re	d mottles, r	noist.						
_			L.	0.95 1.0		_		ļ.,		Grades to				- —	+ $=$	1.0	2863/118/ 1.0	- — — — _{1.0}
BH —	Nil	N	D	1.1		_	' 9 PI /	EW	EXTREMELY WE	gravels.		r, with 			+ -	1.0	2863/118/ 1.0	
				1.1						graves erminated at ' ak sandstone								2.0
				- - -														
4.0																		4.0
				_														
				4.5						TD 4 TI 2	10107=:::							4.
N S BH H/ A CO V TO	Na Sp H Ba A Ha Au C Cor V-E C Tun	atural o ade ckhoe and au iger ncrete Bit	Core	ure S S et R N	SUPPC SH Sh SC Sh RB Ro Nill No	oring otcrete ck Bo suppe	lts <u>▼</u> Wat ort 	e obse measu er leve er outf	rved D Dry L Lored M Moist M M M M M M M M M M M M M M M M M M M	ow VS oderate S gh F efusal St VSt H F	Very Soft Soft Firm Stiff Very Stiff Hard Friable	DENSITY VL Very Loo: L Loose MD Medium D D Dense VD Very Dens	se A A B B Dense U U D D se M M Ux T E Er	uger sai ulk sam Indisturb isturbed loisture ube san nvironm	ple ped sample d sample content nple (x mm) ental samp	PI S V: D D) FI le W	D Pocket penetrometer Standard penetration test Standard penetration test Varies shear CP Dynamic cone penetrometer D Field density S Water sample DNS	CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION Y USCS N Agricultural

CLI	ENT	Γ	SI	noalhav	/en	City	Counci	1		COMMENCED	19.09.12	COMPL	ETED	19.09.	12		REF	BH120
PRO	JΕ	СТ	G	eotechi	nica	al an	d Contai	mina	ation Assessment	LOGGED	BM/JF	CHECK	ED	JF			Sheet 1 c	
SIT	E		Lo	t 1/DP1	02 ²	1332	and Lot		/DP1063107 George	GEOLOGY	Sandstone	VEGET	ATION	Grass			PROJECT NO	P1002863
EQUI	PMEN	ΝT			На	nd Auge	er	<u>\E</u> \	/ans Rd, Mundamia	EASTING	NA	RL SUR	FACE	NA				
				SIONS			1.6m depth			NORTHING	NA	ASPEC	Т	North			SLOPE	<5%
	EX	CAV	/ATI	ON DA					MA	TERIAL DA	TA					SAMPLIN	IG & TESTI	ING
МЕТНОБ	SUPPORT	WATER	MOISTURE	DEPTH (M)	١.	M PENETRATION H RESISTANCE	GRAPHIC LOG	CLASSIFICATION	Soil type, texture, structure, n particle characteristics, orga	PTION OF STR nottling, colour, pla anics, secondary a antamination, odou	sticity, rocks, oxidation, nd minor components,	CONSISTENCY		DENSITY INDEX	TYPE	DEРТН (M)		
НА	Nil	Z	D	1.0				XX SM	FILL - SILTY SAN sandstone gravels ((brick, stee	ID - Light bro 5-10mm, 5% al), glass and), building waste				A	0.05 2863/12(0.2 2863/12(- - - - - 1 <u>.0</u> - -
EC	UIPA	MENT	/ ME*		UPP	ORT	WATER		Borehole terminat		n silty sand fill.	S	AMPLIN	IG & TE	STING			
HA CC V TC	BH Backhoe bucket									gh F fusal St VSt H	Soft L Loose Firm MD Mediu Stiff D Dense Very Stiff VD Very D Hard	m Dense U Dense M U	Undis	sample	nple ent (x mm)	VS Vane sh DCP Dynan penetri FD Field de	nic cone ometer nsity	SOIL DESCRIPTION Y USCS N Agricultural
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATION										IATIONS								
										MARTENS &	ASSOCIATES PTY LT	D					_	

CLI	ENT	<u> </u>	Sł	oalhav	en	City	Council	<u> </u>			COMMENCED	19.09.12		COMPLETED	19.09	9.12			REF	BH121	
PRO	ΟJΕ	СТ	Ge	eotechr	nica	al and	d Contar	nina	ation	Assessment	LOGGED	BM/JF		CHECKED	JF				Sheet 1 c		
SIT	E		Lo	1/DP1	021	332	and Lot	458/	DP1	063107 George	GEOLOGY	Sandstone		VEGETATIO	NA NA				PROJECT NO	- P1002863	
EQUI		NT			Aug	ger		\Ev	ans	Rd, Mundamia	EASTING	NA		RL SURFACE	E NA						٦
			IMEN	SIONS	_		0.7m depth				NORTHING	NA		ASPECT	North	1			SLOPE	<5%	_
				ON DA						M/	ATERIAL DA			l .			SA		G & TESTI		٦
METHOD	SUPPORT	WATER	MOISTURE	DЕРТН (M)		M PENETRATION H RESISTANCE	GRAPHIC LOG	CLASSIFICATION	So p		PTION OF STR	ATA	dation, nents,	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)		<u> </u>		
НА	Nil	N	D	0.1		<u> </u>		SP	SAN	ND - Light brown, sa	andstone gra	vels (5-50mn	n, 10%).			A		2863/121			
НА	Nil	N	D	- - 0.4			P1	w		WEAK WEAT Light	THERED SAN t brown, grave					A	0.2	2863/121	/0.2		1 1
НА	Nil	N	D	0.6			4 6	MS		WEAK TO MEDIU Lig	IM STRONG ht brown/grey		IE -			A B	0.5 0.5	2863/121 2863/121	/0.5 /0.5		
НА	Nil	N	_	0.7	H		7 7	S		MEDIUM STRONG qua	SANDSTON artzite gravels		own,								
				_							l at 0.7m on s sandstone.	trong									
				1.0														1	1.0		
															1						
															-						
															-2.0						
																	-				
				- -																	-
				_																	-
				_																	-
				_																	
				3.0																3	3.0
				_																	-
				-																	-
				-																	
				-																	
				_																	
				4.0																4	.0
				_																	-
				-																	
Щ				4.5	Щ		<u></u>			MOIOTIUS =	TD 4 T/ 2 · · · · · · · · · · ·	OLOTE: : :::									1.5
N	Na	tural e	/MET xposu	re SH		horing	WATER N None	e obse	rved	D Dry L Lo	ow VS	Very Soft VL	NSITY Very Loos	se A Aug	.ING & T jer sampl	le	pp	Pocket pe	enetrometer	CLASSIFICATION SYMBOLS AND	
S BH	Sp	ade	bucke	SC	C Sh	hotcrete ock Bolt	X Notr		red		oderate S	Soft L		B Bull	sample disturbed		S	Standard Vane she	penetration test	SOIL DESCRIPTION	
HA A		nd aug				o suppo	ort <u>¥</u> Wate			Wp Plastic limit R Re Wl Liquid limit	efusal St	Stiff D		D Dis	turbed sa sture cor	mple		CP Dynam penetro	ic cone	Y USCS	
CC	Cor	ncrete	Corer							ычый шш	H	Hard	very ⊔enS	Ux Tub	e sample	(x mm)		Field den	sity	N Agricultural	
	Tun	gsten	Carbio	le Bit			→ Wate	er inflo	w		F	Friable		E Envi	ronmenta	aı sample	e W	S Water sa	ırıpıe		
PT	Pus	sh tube	9		—				20 ==	NDE DE 45 III 22:	INOTION	1 40001:5:	VINO DEE	ODT NOTE:	ANIE :	DDD=-	// *	NIC .			4
							:AUAVATI(JN L(JG IC	BE READ IN CONJU	JING HON WITH	I ACCOMPAN	TING REP	UKINUIES	AND A	'RRKF/	/IATIC	אוע			4

CL	IEN	Т	S	hoalhav	/en	City	Counci	ı		COMMENCED	19.09.12	COMPLETE	ĒD	19.09.12			REF	BH123
PR	OJE	СТ	G	eotechr	nica	ıl an	d Contai	mina	tion Assessment	LOGGED	BM/JF	CHECKED		JF			Sheet 1	
SIT	Έ		Lc	t 1/DP1	021	332	and Lot		DP1063107 George	GEOLOGY	Sandstone	VEGETATION	ON	NA			PROJECT N	O. P1002863
EQI	IPMEI	NT			Han	nd Auge	er	\ <u>Ev</u>	ans Rd, Mundamia	EASTING	NA	RL SURFAC	CE	NA				
EXC				SIONS		imm X	0.45m depth			NORTHING	NA	ASPECT		North			SLOPE	<5%
_	EX	CA	/AT	ON DA					M A	ATERIAL DA	ATA				S	AMPLIN	IG & TEST	ING
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	L DENETD ATION	M PENELIKALION H RESISTANCE	GRAPHIC LOG	CLASSIFICATION	Soil type, texture, structure, n particle characteristics, orga	PTION OF STR mottling, colour, pla anics, secondary a ontamination, odou	sticity, rocks, oxidation, and minor components,	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)			
НА	Nil	N	D	0.15	Ι			SP	SAND - Li	ight brown/gr	ey, wet.			A		2863/123		
НА	Nil	N	D	_ 			P 7 9	EW	EXTREMELY WEAK SANDSTONE - Gre					A				- - -
				-					Borehole termina	ted at 0.45m	on sandstone.							_
				_														_
				_ 1.0														1.0
				_														
																		_
				_														_
				<u>-</u>														-
				2.0														2.0
																		2.0
				<u>-</u>														-
				_														-
				_														-
				-														
				3.0														3.0
				-														_
				<u>-</u>														-
																		-
4.0																		
				4.0														4.0
				-														-
				– 4.5														-
				THOD SL	UPPO		WATER				SISTENCY DENSITY			& TESTII	NG	<u> </u>		CLASSIFICATION
BH Backhoe bucket RB Rock Bolts V Water level W Wet H High F Firm MD Medium Dense U Undisturbed sample VS Vane shear HA Hand auger Nil No support W Plastic limit R Refusal St Stiff D Dense D Disturbed sample DCP Dynamic cone Y USCS A Auger Water outflow WI Liquid limit VST Very Stiff VD Very Dense M Moisture content penetrometer													SOIL DESCRIPTION Y USCS					
V T	C Cor V-E C Tur T Pu	Bit ngsten	Carbi				→ Wat			F	Hard Friable	E Er	nviron	ample (x m mental sam	iple V	FD Field der WS Water s		N Agricultural
\vdash						E	=XCAVATI	JN LC	OG TO BE READ IN CONJU	INC HON WITH	ACCOMPANYING RE	PURT NOTE	S AN	ID ABBR	∟VIAT	IONS		

	IEN						Counci		tion Accessor	LOGGED	19.09.12		CHECKED		.09.12		REF	TP124
PR SIT	OJE	:CT	-						DP1063107 George	GEOLOGY	BM/JF Sandstone		VEGETATI	JF	ees and sh	rubs	Sheet 1 o	
-	JIPME	NT	L	. I/DF I	_	khoe	ana LUI		vans Rd, Mundamia		NA		RL SURFA	_		ii uu S	PROJECT NO	P1002863
-			DIMEN	SIONS	+)m X 0.8m			NORTHING	NA		ASPECT	_	orth		SLOPE	5-10%
	EX	CA	/AT	ON DA					MA	ATERIAL D	ATA					SA	MPLING & TESTI	NG
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	J. DENETD ATION	# RESISTANCE	GRAPHIC LOG	CLASSIFICATION	Soil type, texture, structure, r particle characteristics, org	PTION OF STE mottling, colour, pl janics, secondary ontamination, odo	asticity, rocks, and minor con	oxidation, nponents,	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)		
s	Nil	N	D	- -				SC	CLAYEY SAND - Ora	ange/yellow, avels (5-10mi	moist, fine n, 5%).	grained,			E	0.05	2863/124/ 0.05	
s	Nil	N	D	0.25 				EW	EXTREMELY W	— — — /EATHERED	— — –	_		- —	E	0.3	2863/124/ 0.3	· — — — - ;
N Natural exposure SH Shoring N None observed D Dry L Low VS Very Soft VL Very Loose A Auger sample pp Pocket penetrometer SY S Spade SC Shotcrete X Not measured M Moist M Moderate S Soft L Loose B Bulk sample S Standard penetration test SC													1 <u>1</u>					
N S B	I Na Sp H Ba IA Ha	atural bade ickhoe and au	expos buck	THOD S ure S S et R	H Sh C Sh B Ro	oring otcrete ock Bol	N None X Not Its \(\frac{\text{T}}{2} \) Wat	ne obse measu ter leve	rved D Dry L Lo red M Moist M M I W Wet H Hi Wp Plastic limit R Re	ow VS loderate S igh F efusal St	Very Soft Soft Firm Stiff	VL Very Loo	se A A B B Dense U L	uger sar ulk samp ndisturb	nple ole ed sample	pr S V	p Pocket penetrometer Standard penetration test S Vane shear CP Dynamic cone	CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION Y USCS
A C V T	HA Hand auger Nil No support Wp Plastic limit R Refusal St Stiff D Dense D Disturbed sample DCP Dynamic cone Y USCS A Auger Water outflow WI Liquid limit VSt Very Stiff VD Very Dense M Moisture content penetrometer CC Concrete Corer V V-Bit Water inflow F F Friable F Environmental sample WS Water sample TC Tungsten Carbide Bit PT Push tube																	
\vdash						- 1	EXCAVATI	ON LO	OG TO BE READ IN CONJU	JNC HON WITI	1 ACCOMP	ANYING REP	UKI NOTE	S AND	ABBRE	VIATI	UNS	

CLI	EN	ſ	Sh	oalhav	en City	Counci			COMMENCED	19.09.12	co	MPLETED	19.09.12			REF	TP125
PR	IJΕ	СТ	Ge	otechr	ical an	d Contai	ninati	ion Assessment	LOGGED	BM/JF	СН	IECKED	JF			Sheet 1 of	1
SIT	E		Lot	1/DP1	021332	and Lot		P1063107 George	GEOLOGY	Sandstone	VE	GETATION	Trees and	shrubs		PROJECT NO.	P1002863
EQUI	PMEN	NT			Spade		<u> Eva</u>	ns Rd, Mundamia	EASTING	NA	RL	SURFACE	NA				
EXC	VAT	ION D	IMENS	SIONS	3.0m X 1.0	m X 0.6m			NORTHING	NA	AS	PECT	North			SLOPE	5-10%
	EX	CAV	ATI	ON DA				MA	TERIAL DA	ATA				S	AMPLIN	G & TESTII	NG
МЕТНОБ	SUPPORT	WATER	MOISTURE	DEPTH (M)	L PENETRATION H RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIF Soil type, texture, structure, n particle characteristics, orga fill, co	PTION OF STR nottling, colour, pla anics, secondary a ntamination, odou	sticity, rocks, oxida	tion, nts,	CONSISTENCY	DENSITY INDEX	DEPTH (M)			
S	Nil	N .	D	0.05	 	x x >	SM	ORGANIC SILTY	SAND - Brow	n, dry, rootlets	i. / -			A 0.05	2863/12	5/ 0.05	
s	Nil	Ν	D	- - - 0.4			sc	CLAYEY SAND - Ora	nge/yellow, r vels (5-10mn	noist, fine grainn, 5%).	ned,		,	A 0.3	2863/129 CBR 128	5/ 0.3 + DUP3 5 0.1-0.4	- -
															1.0		
				- 15													-
N S BH H A CO V TO	Na Sp I Ba Ha Au Cor V-B Tun	itural e ade ckhoe nd auq ger ncrete Bit	Corer Carbid	re SH SC : RE Nil	3 Rock Bol I No suppo	lts <u>▼</u> Wat ort 	e observe measured er level er outflov er inflow	ed D Dry L Lo d M Moist M Mc W Wet H Hig Wp Plastic limit R Re w WI Liquid limit	w VS oderate S yh F fusal St VSt H F	Soft L Firm MD Stiff D Very Stiff VD Hard Friable	Very Loose Loose Medium Dense Dense Very Dense	A Auger B Bulk s U Undis D Distur M Moistr Ux Tube E Enviro	ample turbed sam bed sample ure content sample (x n nmental sai	ple \ e [nm) F mple \	S Standard /S Vane she DCP Dynam penetro FD Field der WS Water sa	ic cone ometer osity	4.5 CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION Y USCS N Agricultural
—						LACAVAIR	JIN LUC	O TO DE IVEND IN CONJU		ACCOIVIPAINTI	NEPUKI	INOIESA	"4D WDDI	\∟ V IA I	IOINO		

CLI	EN	Γ	S	hoalha	ven Cit	y Counc	i		COMMENCED	19.09.12	COMPLETED	19.0	09.12			REF	TP126	Ç
PR	OJE	СТ	G	eotech	nical a	nd Conta	mina	ation Assessment	LOGGED	BM/JF	CHECKED	JF				Sheet 1		
SIT	E		Lo	t 1/DP1	021332	2 and Lot		/DP1063107 George	GEOLOGY	Sandstone	VEGETATION	I Tre	es and sh	rubs		PROJECT N	O . P1002863	
EQU	IPME	NT			Backhoe		/E	vans Rd, Mundamia	EASTING	NA	RL SURFACE	. NA						
EXC				ISIONS		.0m X 2.5m			NORTHING	NA	ASPECT	Nor	th			SLOPE	5-10%	
Щ	EX	CA	/AT	ION DA			1_	M A	ATERIAL DA	NTA			+	SA	MPLIN	G & TEST	TING	
МЕТНОD	SUPPORT	WATER	MOISTURE	DEPTH (M)	L PENETRATION H RESISTANCE	GRAPHIC LOG	CLASSIFICATION	Soil type, texture, structure, n particle characteristics, orga	PTION OF STR mottling, colour, pla anics, secondary a antamination, odou	sticity, rocks, oxidation, and minor components,	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)				
вн	Nil	N	D	-			XX	FILL - Gravelly/c moist, gravels (5-20					Е	0.25	2863/12		layer at 0.8m.	- - - -
вн	Nil	N	D	1.0			SC	CLAYEY SAND - Ora	ange/yellow, r avels (5-10mn				E B	0.9	2863/12	6/ 0.9		1.0
ВН	Nil	N	D				sc		/ SAND - Ora 5-20mm, 30-	nge/brown, moist, 40%).								-
вн	Nil	N	D	2.0			EW	coarse grained sa	andstone with				В	2.0	2863/12 2863/12			2.0
BH Nil N D EXTREMELY WEAK SANDSTONE - Grey, coarse grained sandstone with conglomerate rounded quartz.																		3.0
N S BH A C V T (Na Sp H Ba A Ha C Coo V-E C Tur	atural o ade ckhoe and au ager ncrete Bit	expos buck ger Core	ure S S et R N	UPPORT H Shoring C Shotore B Rock B il No sup	ete X Not polts \(\frac{\psi}{\psi} \) Wa \(\frac{\psi}{\psi} \) Wa	ne obse measu ter leve ter out	erved D Dry L Lo red M Moist M Mo el W Wet H Hig Wp Plastic limit R Re flow WI Liquid limit	ow VS oderate S gh F efusal St VSt H F	SISTENCY	ose A Aug B Bulk Dense U Und D Dist se M Moi: Ux Tub E Envi	er samplisturbe curbed c sture of e samp ronmer	e d sample sample ontent ile (x mm) ntal sampl	PF S VS DC FC e W	Standard S Vane sho CP Dynam penetro D Field der S Water sa	ic cone ometer osity	CLASSIFICATI SYMBOLS ANI SOIL DESCRIF Y USCS N Agricultur	D PTION

CL	IEN	Г	S	hoalhav	en City	Counci			COMMENCED	19.09.12	COMPLETE	19.09	9.12			REF	TP127
_	OJE	СТ	_					tion Assessment	LOGGED	BM/JF	CHECKED	JF				Sheet 1 of	
SIT			Lo	t 1/DP1		and Lot		DP1063107 George	GEOLOGY	Sandstone	VEGETATIO	_	s and sh	rubs		PROJECT NO.	P1002863
_	IPME				Backhoe		/EV	ans Rd, Mundamia	EASTING	NA	RL SURFAC	_				0.005	5.400/
EXC				ISIONS	3.0m X 1.0	m X 1.4m		M	NORTHING	NA	ASPECT	Norti	n 	9.4	MDIIN	SLOPE	5-10% NG
\vdash						-	z	IVIZ	TI LINIAL DA	NIA .				- J	WIT LIN	O & ILSIII	10
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	L PENETRATION H RESISTANCE	GRAPHIC LOG	CLASSIFICATION	Soil type, texture, structure, n particle characteristics, orga	PTION OF STR nottling, colour, planics, secondary a ontamination, odo	asticity, rocks, oxidation, and minor components,	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)			
вн	Nil	N	D	0.1		* * * *	SM	ORGANIC SILTY	SAND - Brow	n, dry, rootlets.			Е	0.05	2863/12	7/ 0.05	
вн	Nil	N	D	0.4			sc	CLAYEY SAND - Ora	ange/yellow, ravels (5-10mr	noist, fine grained, n, 5%).			E B	0.3	2863/12 2863/12	7/ 0.3 7/ 0.3	
вн	Nil	N	D	- - - - 1.0			SC	,	/ SAND - Ora 5-20mm, 30- Grades to	nge/brown, moist, 40%).							1 <u>u</u>
ВН	Nil	N	D	1.1 - -	+ - -	P 9	EW	EXTREMELY W coarse grained sa	— — — 'EAK SANDS				E B	1.2	2863/12 2863/12	7/ 1.2 7/ 1.2	· — — — - ·
E	QUIPT	MENT	/ME		UPPORT	WATER		Test pit terminated weak to med	d at 1.4m (bu		SAMPI	LING & T	ESTING				2_ 4_ CLASSIFICATION 4.
N S B H A C	N Natural exposure SH Shoring N None observed D Dry L Low VS Very Soft VL Very Loose A Auger sample S Standard penetration test SYMBOLS AND S Spade S C Shotcrete X Not measured M Moist M Moderate S Soft L Loose B Bulk sample S Standard penetration test S																
۲	T Pu	sh tub	e		E	XCAVATION	ON LC	OG TO BE READ IN CONJU	JNCTION WITH	I ACCOMPANYING REF	PORT NOTES	AND A	BBRE	VIATIO	ONS		
\vdash													-				

CL	IEN	Т	S	hoalhav	/en	City	Council	l		COMMENCED	19.09.12	COMPLETE	ED	19.09.12			REF	TP128
PR	OJE	СТ	G	eotech	nica	l and	d Contar	nina	tion Assessment	LOGGED	BM/JF	CHECKED		JF			Sheet 1	
SIT	Έ		Lo	t 1/DP1	021	332 a	and Lot		DP1063107 George	GEOLOGY	Sandstone	VEGETATION	ОИ	Trees and s	hrubs		PROJECT N	O. P1002863
EQU	IPME	NT			Bac	khoe		\ <u>Ev</u>	ans Rd, Mundamia	EASTING	NA	RL SURFAC	CE I	NA				
EXC				SIONS		n X 1.0ı	m X 1.3m			NORTHING	NA	ASPECT		North			SLOPE	5-10%
	EX	CAV	/AT	ON DA					MA	TERIAL DA	TA .			_	SA	MPLIN	G & TES	TING
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	J. CITA GTONGO.	H RESISTANCE	GRAPHIC LOG	CLASSIFICATION	Soil type, texture, structure, n particle characteristics, orga	PTION OF STR. nottling, colour, pla anics, secondary a antamination, odou	sticity, rocks, oxidation, nd minor components,	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)			
вн	Nil	N	D	0.1			× × ×	SM	ORGANIC SILTY	SAND - Brow	n, dry, rootlets.			Е	0.05	2863/12	8/ 0.05	
F			Ħ	0.1	Ħ				- — — — — -			T = T	_	- 	0.2-	2863/12	8/ 0.2-0.3	
ВН	Nil	N	D	- -				sc	CLAYEY SAND - Ora minor gra	inge/yellow, n ivels (5-10mm	noist, fine grained, n, 5%).			E B	0.3 0.3 0.2- 0.4		8/ 0.3 0.2-0.4m 8/ 0.2-0.4	- - -
ВН	Nil	N	D	0.5				CL	SANDY CLAY - Or	ange/grey/red	I mottles, moist.			В	1.0	2863/12	8/ 1.0	- - - - 1 <u>.0</u>
\vdash					\dagger	- -	h , 4		EXTREMELY WEA		NF - Grev with	+ - +		- + -	-			
ВН	Nil	N	D	1.3			(,4 ,	EW		ginised gravel								-
					UPPC		WATER			FRATION CONS	SISTENCY DENSITY			s & TESTIN	G			2.0 2.0 3.0 4.0 4.0 CLASSIFICATION
N S B	Na Sp	atural e ade ckhoe	expos	ure S S	H Sh C Sh		N None X Not i		rved D Dry L Lo red M Moist M Mo	w VS oderate S	Very Soft VL Very Loc Soft L Loose Firm MD Medium	ose A Ai B Bi	uger s ulk sa	ample	p _l S	Pocket po Standard S Vane sho	enetrometer I penetration te ear	SYMBOLS AND
H A C V T	A Ha Au C Cor V-E	ind au iger ncrete Bit igsten	ger Core Carbi	N		suppo	rt <u>▼</u> → Wat	er outfl er inflo	Wp Plastic limit R Re ow Wl Liquid limit	fusal St	Stiff D Dense Very Stiff VD Very Den Hard Friable	D Di ise M Mi Ux Tu E En	isturb oistur ube sa ivironi	ed sample e content ample (x mn mental samp	n) Fi ble W	CP Dynam penetro D Field der /S Water sa	nic cone ometer nsity	Y USCS N Agricultural

						Council			COMMENCED	19.09.12		COMPLETED		12			KEF	BH129	9	
PRO		СТ	+					tion Assessment	LOGGED	BM/JF		CHECKED	JF				Sheet 1	of 1		
SIT	E		Lot	: 1/DP1	021332	and Lot		DP1063107 George	GEOLOGY	Sandstone		VEGETATION	Trees	and shr	ubs		PROJECT N	O. P1002863		
EQUI					Hand Auge		F	vans Rd, Mundamia	EASTING	NA		RL SURFACE								
			IMENS			0.7m depth			NORTHING	NA		ASPECT	North				SLOPE	<5%		
	EXC	CAV	ATI	ON DA				M.A	TERIAL DA	ATA					SA	MPLING	3 & TES1	TING		
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	L PENETRATION H RESISTANCE	GRAPHIC LOG	CLASSIFICATION	Soil type, texture, structure, n particle characteristics, orga	PTION OF STR nottling, colour, planics, secondary a intamination, odor	asticity, rocks, oxidation and minor components,	n,	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)					
НА	Nil	N	D	0.1		* * * * * * * * * * * * * * * * * * * *	SM	TOP SOIL - SILTY SAM	ND - Light bro	own, minor organi	ics.			A	0.05	2863/129/	0.05			
HA	Nil	N	D	_ _ 		* * * * * * * * * * * * * * * * * * *	SM	SILTY SAND - B	Brown, with m	inor organics.				A	0.25	2863/129/0	0.25		-	
НА	Nil	N	D	- - 0.7			SP	GRAVELLY SAND Ligh	- Gravels (5- t brown, mois										-	
				-		33. 3. 42			erminated at ravely sand.	0.7m on									-	
				1.0 -															1 <u>.0</u>	
				- - -															-	
									2_											
				- - -																
				- - -															-	
				- - - 3.0															- - 3.0	
				- -															-	
				- -															-	
				-															- - -	
				<u>4.0</u> - -															4.0	
				- - <u>4</u> .5															- 4. <u>5</u>	
N S BH A C V TC	Na Spa Hai Au Au Cor V-B Tun	tural e ade ckhoe nd aug ger ncrete sit	Corer	re SH SC t RE Nil	JPPORT I Shoring C Shotcrete Rock Bol I No suppo	lts <u>▼</u> Wate ort <u></u> Wate → Wate	e obse measur er leve er outfl er inflo	rved D Dry L Lo red M Moist M Mo red W Wet H Hig Wp Plastic limit R Re low WI Liquid limit	w VS oderate S gh F fusal St VSt H F	Soft L Lor Firm MD Me Stiff D Dei Very Stiff VD Ver Hard Friable	ery Loose oose edium De ense ry Dense	e A Aug B Bulk ense U Und D Dist M Mois Ux Tube E Envir	NG & TE er sample sample isturbed s urbed san sture cont e sample onmental	ample nple ent (x mm) sample	pp S VS DC FD WS	Vane shea CP Dynamic penetron Field dens S Water san	penetration test ar c cone neter ity	CLASSIFICAT SYMBOLS AN SOIL DESCRI Y USCS N Agricultu	ID IPTION	
<u> </u>						=vcava1[JN L(OG TO BE READ IN CONJU	INCTION WITE	I ACCOMPANYING	KEPU	IN I NOTES	MIND AE	ort/	MATIC	ONO				

CLIEN		+-			Council			COMMENCED	19.09.12	COMPLETED	19.09	9.12		REF	BH130
PROJE	ECT	Ge	eotechr	ical and	d Contar	nina	tion Assessment	LOGGED	BM/JF	CHECKED	JF			Sheet 1 of	r 1
SITE		Lo	1/DP1	021332	and Lot		DP1063107 George	GEOLOGY	Sandstone	VEGETATIO	Tree:	s and shr	ubs	PROJECT NO.	P1002863
EQUIPME	NT			Hand Auge	er	<u>LEV</u>	ans Rd, Mundamia	EASTING	NA	RL SURFACE	NA				
EXCAVA	ION E	DIMEN	SIONS	Ø70mm X	0.6m depth			NORTHING	NA	ASPECT	North	h		SLOPE	<5%
EX	CA	/ATI	ON DA				M	ATERIAL DA	ATA				SAMPLI	NG & TESTII	NG
METHOD	WATER	MOISTURE	DEPTH (M)	L PENETRATION H RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRI Soil type, texture, structure, particle characteristics, org fill, c	PTION OF STR mottling, colour, pla ganics, secondary a ontamination, odou	asticity, rocks, oxidation.	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)		
HA Nil	N	D.	0.05		× × ×	SM	ORGANIC SILTY	SAND - Brow	n, dry, rootlets.	 		_E	0.05 2863/13	80/0.05	
HA Nil	N	D	- - - 0.5			SC	CLAYEY SAND - Ori	ange/yellow, r avels (5-10mn	noist, fine grained, n, 5%).			E	0.25 2863/13	30/0.25	- - -
HA Nil	N		0.6			SP	GRAVELLY SAND								
			- - - - - - - - - - - - - - - - - - -				Borehole termi	nated at 0.6m gravely sand.							- 1 <u>.0</u> - - - - - - 2.0
			- 33.0 44.0 												- 3.0 - - - - - - 4.0 - - - - - - - - - - - - - - - - - - -
S S _I BH Ba HA Ha	atural o bade ackhoe and au uger increte Bit ngsten	exposu e bucke iger e Corer i Carbio	HOD SU re SH SC t RE Nil	3 Rock Bolt No suppo	ts <u>▼</u> Wate ort <u></u> Wate	e obser measure er level er outfle er inflov	rved D Dry L Lored M Moist M M I W Wet H H Wp Plastic limit R R low WI Liquid limit	ow VS loderate S igh F efusal St VSt H F	SISTENCY	oose A Aug B Bull n Dense U Und D Dis ense M Moi Ux Tub E Envi	er sample s sample listurbed turbed sa sture cor e sample ronment	I sample ample ntent e (x mm) al sample	pp Pocket S Standa VS Vane s DCP Dyna penet FD Field de WS Water s	mic cone rometer ensity	CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION Y USCS N Agricultural

CL	IEN	Γ	S	hoalhav	en City	Counci	1		COMMENCED	19.09.12	COMPLETE	D 19.09	9.12			REF	TP131
PR	OJE	СТ	G	eotechi	nical and	l Conta	mina	tion Assessment	LOGGED	BM/JF	CHECKED	JF				Sheet 1 c	_
SIT	Έ		Lc	t 1/DP1	021332 a	and Lot		DP1063107 George	GEOLOGY	Sandstone	VEGETATIO	N Tree	s and sh	rubs		PROJECT NO	- P1002863
EQL	IPME	ΝT			Backhoe		\ <u>Ev</u>	ans Rd, Mundamia	EASTING	NA	RL SURFAC	E NA					
EXC				ISIONS	3.0m X 1.0r	n X 1.3m			NORTHING	NA	ASPECT	Norti	h			SLOPE	5-10%
_	EX	CAV	/AT	ION DA			1_1	M.A	TERIAL DA	ATA				SA	MPLIN	IG & TESTI	NG
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION H RESISTANCE	GRAPHIC LOG	CLASSIFICATION	Soil type, texture, structure, n particle characteristics, orga	PTION OF STR nottling, colour, planics, secondary a nntamination, odor	asticity, rocks, oxidation, and minor components,	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)			
BH	Nil	N	D	0.05		× × >	SM	ORGANIC SILTY	SAND - Brow	n, dry, rootlets.			_A_	0.05	2863/13	1 <u>/ 0.05_+ DUP4</u>	
вн	Nil	N	D	_ _ _ 			sc	CLAYEY SAND - Ora	=	noist, fine grained,			A	0.25	2863/13	1/ 0.25	
ВН	Nil	N	D	- - - -			SP	GRAVELLY SAND Ligh	- Gravels (5-t t brown, mois				В	0.5	2863/13	1/ 0.5	
				1.0 1.05					Grades to								1 <u>.0</u>
вн	Nil	N	D	1.3		P	EW	EXTREMELY Light grey,		operties,			В	1.2	2863/13	1/ 1.2	- — — — .
								Test pit terminated	at 1.3m on v	veak sandstone.							
				_ _ _ _ _ _ 2.0													2.1
				-													
				-													
				-													
				-													
				-													
				-													
				-													
				-													
				3.0													3.0
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				_													
				_													
				_													
				-													
				-													
				-													
		F															
				4.0													4.0
				-													
				_ <u>4</u> .5									1				4.
N S B H	EQUIPMENT / METHOD SUPPORT WATER MOISTURE PENETRATION CONSISTENCY DENSITY SAMPLING & TESTING Natural exposure Sh Shoring Not measured Sh Shoring Sh Shoring Sh Shoring Not measured Sh Shoring Sh Shoring Sh																
V T	V-E C Tun	Bit gsten	Carb	ide Bit		→ Wat	er inflo	w		Friable		/ironment			/S Water sa		, ignositurui
ピ	T Pus	sn tub	е		E	XCAVATI	ON LO	OG TO BE READ IN CONJU	INCTION WITH	I ACCOMPANYING RE	PORT NOTES	S AND A	BBRE	VIATIO	ONS		
\vdash												$\overline{}$					

CLI	EN		Sł	noalha	vei	1 City	Council	ı		COMMENCED	19.09.12	co	MPLETED	19.09.12			REF	BH132
PR	OJE	СТ	G	eotech	nic	al an	d Contar	ninati	ion Assessment	LOGGED	BM/JF	СН	ECKED	JF			Sheet 1 of	
SIT	E		Lo	t 1/DP	102	1332	and Lot	458/D	P1063107 George	GEOLOGY	Sandstone	VE	GETATION	Trees and	shrubs		PROJECT NO.	P1002863
EQU		NT			Н	and Auge	er	<u> Eva</u>	ans Rd, Mundamia	EASTING	NA	RL	SURFACE	NA			•	
			IMEN	SIONS	-		0.5m depth			NORTHING	NA		PECT	North			SLOPE	<5%
				ON DA	_		1		M.A	TERIAL DA	TA				S	AMPLIN	G & TESTI	
МЕТНОБ	SUPPORT	WATER	MOISTURE	DEPTH (M)		M PENETRATION R RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRI Soil type, texture, structure, r particle characteristics, org	PTION OF STR	ATA sticity, rocks, oxidation,	,	CONSISTENCY	DENSITY INDEX	DEPTH (M)		<u> </u>	
НА	Nil	N	D		\top			xx	FILL - Sand, with	gravels (5-50	mm, 30-40%),				A 0.05	2863/132	2/0.05	
HA	Nil	N	D .	0.1	+	-		sc	bı	own/orange.		_			-	+-		
				0.2	+	-		-	CLAYEY SAND - Ora	ange/yellow, r	noist, fine grained	d,	-+ -	-+	A 0.2	2863/132		
НА	Nil	N	D	- - 0.5				SP	SAND, WITH GRAVE	evels (5-10mm		n.						- -
				- 1.0 - 1.0 					Borehole termin	nated at 0.5m	(refusal) on							
																		- 4 <u>.0</u> - - - - - 4. <u>5</u>
			/ MET			PORT	WATER				SISTENCY DENSITY			IG & TEST		n Doolest -	enetromete-	CLASSIFICATION
N S	Sp	ade	exposu	5	SC S	Shoring Shotcrete		measured	d M Moist M M	oderate S	Very Soft VL Ve Soft L Loc	ose	A Auger B Bulks	ample	5	Standard	enetrometer d penetration test	SYMBOLS AND SOIL DESCRIPTION
BH HA	A Ha	nd au	bucke ger			Rock Bol No suppo	lts <u>▼</u> Wat	er level	W Wet H Hi Wp Plastic limit R Re	efusal St	Firm MD Me Stiff D Der	dium Dense	U Undis D Distur	turbed sam bed sample	iple \ e [/S Vane sho OCP Dynam	ear	Y USCS
Α	Au	ger	Corer					er outflov		VSt	Very Stiff VD Very Hard		M Moist	ure content sample (x n		penetro D Field der	ometer	
V	V-E	Bit					→ Wat	er inflow			Hard Friable			sampie (x n nmental sai		VS Water sa		N Agricultural
		gsten sh tub	Carbio e	te Bit				_							_			
							EXCAVATION	ON LOC	G TO BE READ IN CONJU	JNCTION WITH	ACCOMPANYING	REPORT	NOTES A	ND ARRE	REVIAT	IONS		
												51(1	1.5.20					

\vdash	LIEN		_				Counci			COMMENCED	19.09.12		COMPLETED	19.09.	.12		F	REF	BH1	33
-	ROJE	СТ							tion Assessment	LOGGED	BM/JF		CHECKED	JF -				Sheet 1 o		
_	TE UIPME	NT	LO	t 1/DP1		332 a			DP1063107 George ans Rd, Mundamia 🌶	GEOLOGY EASTING	Sandstone NA		/EGETATION		and shr	rubs	Р	ROJECT NO.	- P1002863	
-			DIMEN	SIONS			ited rig).85m depth			NORTHING	NA NA		ASPECT	NA North			SL	LOPE	<5%	
۳				ION DA					MA	ATERIAL DA		1.		1		SA	MPLING			
METHOD		WATER	MOISTURE	DEPTH (M)	PENETRATION	H RESISTANCE	GRAPHIC LOG	CLASSIFICATION		PTION OF STR	ATA	on, s,	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)				
V	Nil	N	D	0.05	+-	+1-	××	SM_	TOP SOIL - SILTY	SAND - Dark	brown, organics	s /		- —	_A	0.05	2863/133/0.	.05		
v	Nil	N	D	-				SP	GRAVELY	SAND - Darl	s brown.				Α	0.3	2863/133/0.	3		
v	Nil	N	D	0.6				SP	GRAVELY SAND - Li			vel,			В В	0.5	2863/133/0.	.5		
٧	Nil	N	D	0.85			P1 7	w	WEAK WEAT	ΓHERED SAN	IDSTONE.									-
				1.0 - - - - - - - - - - - - -						al at 0.85m or										1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0
1 3 1 1	S S _I BH Ba HA Ha	atural o bade ackhoe and au uger increte Bit ngsten	exposi e bucki iger e Core i Carbi	ure S S et R N	UPPOR H Sho C Sho B Roo lil No	oring otcrete ck Bolts	s $\nabla \!$	ne obser measure ter level ter outfle	ved D Dry L Lo ed M Moist M M W Wet H Hi Wp Plastic limit R Re ow WI Liquid limit	ow VS oderate S gh F efusal St VSt H	Soft L L Firm MD M Stiff D D	ITY /ery Loose oose ledium Den ense ery Dense	B Bulk s nse U Undis	r sample sample sturbed s irbed sar ture cont sample	sample mple tent (x mm)	pp S VS DO	D Pocket pene Standard pe S Vane shear CP Dynamic of penetrome D Field density S Water samp	cone eter	Y USG	S AND SCRIPTION
F						Е	XCAVATI	ON LC	OG TO BE READ IN CONJU	JNCTION WITH	I ACCOMPANYIN	G REPOF	RT NOTES A	AND AE	BBRE\	VIATIO	ONS			

							d Conta		tion Associant	LOGGED	19.09.12		CHECKED	JF	7.12		KEI		ΓΡ13 ·	6
PRO		:U1	_						tion Assessment DP1063107 George	GEOLOGY	BM/JF Sandstone		VEGETATION	_	s and shi	rubs	Sheet PROJE	1 of 'CT NO. F		
EQUI		NT				khoe			ans Rd, Mundamia	EASTING	NA		RL SURFACE						.002000	
_				SIONS		m X 1.0	0m X 0.6m			NORTHING	NA		ASPECT	North	1		SLOPE	5-1		
\vdash	EX	CA	/ATI	ON DA				T T	M.A	ATERIAL DA	ATA	Т	T			SA	MPLING & T	ESTING	i	
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)		R PENETRATION R RESISTANCE	GRAPHIC LOG	CLASSIFICATION	Soil type, texture, structure, re particle characteristics, orga	PTION OF STR mottling, colour, pla anics, secondary a ontamination, odor	asticity, rocks, and minor com	oxidation, ponents,	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)				
ВН	Nil	N	D	-				XX	FILL - SILT` gravels	Y SAND - Lig s (5-10mm, 1	ht brown, 0%).				В	0.05	2863/136/ 0.05 2863/136/ 0.5			-
				0.6 1.0					Test pit termina	ated at 0.6m o	on silty san	d.								1.6 1.6 2.6
N S BH HA A CO V TO	Na Sp H Ba A Ha Au C Cor V-B C Tun	atural o ade ckhoe and au iger ncrete Bit	Core	ure S S et R N	B Ro	noring notcret ock Bo o supp	lts <u>▼</u> Wa ort 	ne obser measure ter level ter outflow ter inflow	ved D Dry L Lo ed M Moist M M W Wet H Hiq Wp Plastic limit R Re ow WI Liquid limit	ow VS oderate S gh F efusal St VSt H F	Very Soft Soft Firm Stiff Very Stiff Hard Friable	DENSITY VL Very Loos L Loose MD Medium Do D Dense VD Very Dense	B Bulk ense U Und D Dist e M Mois Ux Tub E Envir	er sample s sample listurbed urbed sa sture con e sample ronmenta	sample sample ample atent e (x mm) al sample	PF S VS DC FE e W	Pocket penetromet Standard penetratis Standard penetratis CP Dynamic cone penetrometer D Field density S Water sample DNS	ter Son test S	CLASSIFICA SYMBOLS A SOIL DESCR Y USCS N Agricult	ND RIPTION

-	EN		_				/ Counc			COMMENCED	19.09.12		OMPLETED	19.09.	.12		RE	F	TP13	37
-	OJE	СТ	_						tion Assessment DP1063107 George	LOGGED	BM/JF Sandstone		HECKED	JF	and shr		Sheet		1	
SIT	E IPMEI	uT.	LO	t I/DP1		ckhoe	and Lo		vans Rd, Mundamia	GEOLOGY EASTING	NA		EGETATION RL SURFACE	NA NA	and shi	rubs	PROJ	ECT NO.	P1002863	
-			DIMEN	ISIONS	_		0m X 1.2m	_		NORTHING	NA NA		SPECT	North			SLOPE		5-10%	
	EX	CAV	/AT	ION DA	TA				M	ATERIAL DA	TA					SA	MPLING &	TESTIN	NG	
МЕТНОБ	SUPPORT	WATER	MOISTURE	DEРТН (M)	1	M PENETRATION H RESISTANCE	GRAPHIC LOG	CLASSIFICATION	Soil type, texture, structure, particle characteristics, or	IPTION OF STR mottling, colour, pla ganics, secondary a contamination, odor	asticity, rocks, oxidati	ion, ts,	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)				
ВН	Nil	N	D	_				XX	FILL - Sand, with mir	nor clay, grave light brown.	ls (5-20mm, 10)%),			Α	0.15	2863/137/ 0.15			
BH	Nil	N	D	0.3	\perp	_	×××	sc					- # -		A	0.35	2863/137/ 0.35			
ВН	Nil	N	D	0.7				sc	SILTY SAND - Brow CLAYEY SAND - Or minor gr		noist, fine grain				B A	0.5 0.5	2863/137/ 0.5 2863/137/ 0.5			
ВН	Nil	N	D	- - 1.0				SP	GRAVELLY SAND Lig	- Gravels (5- ht brown, mois Grades to) -								1 <u>.(</u>
BH	Nil	N	D	1.1	\forall	-	P 9	EW	EXTREMELY WE	AK SANDST			- + -		- —	-				
ВН	NII	N		1.2 - - - - - - - - - - - - -				EW	sandy clay properties Test pit terminate	s, sandstone g	ravels and cobl	bles.								2.0 2.0 3.0
N S Bl H A C V	Na Sp H Ba A Ha Au C Cor V-E	itural e ade ckhoe nd au ger ncrete gsten	exposi e bucki ger Core Carbi	ure S S et R N	C S	horing hotcret ock Bo o supp	olts <u>V</u> Wa nort <u>V</u> Wa D Wa	ne obse measu iter leve iter outf	red D Dry L L red M Moist M N H W Wet H H Wp Plastic limit R R low WI Liquid limit	ow VS floderate S igh F efusal St VSt H F	Soft L Firm MD Stiff D Very Stiff VD Very Stiff Friable	Very Loose Loose Medium Dens Dense Very Dense	B Bulk s se U Undis D Distu M Moist Ux Tube E Enviro	r sample sample sturbed s rbed sar ure cont sample onmental	sample mple tent (x mm) I sample	pp S VS DC FD e WS	Pocket penetrom Standard penetra Vane shear PP Dynamic cone penetrometer Field density S Water sample		CLASSIFIC SYMBOLS SOIL DESC Y USC N Agric	AND RIPTION

	IEN		_		ven City			tion Accessor	LOGGED	19.09.12		HECKED	19.09.1	12		REF	
SI	OJE	:CT	_					DP1063107 George	GEOLOGY	BM/JF Sandstone		EGETATION	JF Grass			Sheet	1 of 1 F NO . P1002863
-	JIPME	NT		,טו	Truck mour			ans Rd, Mundamia	EASTING	NA		SURFACE	_			i KOJEC	F 1002003
-	CAVA	ΓΙΟΝ [SIONS		1.6m depth			NORTHING	NA		SPECT	North			SLOPE	<5%
L	EX	CA	/AT	ON DA				MA	ATERIAL D	ATA			\Box		SA	MPLING & TE	STING
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	L PENETRATION H RESISTANCE	GRAPHIC LOG	CLASSIFICATION	Soil type, texture, structure, r particle characteristics, org	PTION OF STR mottling, colour, pl janics, secondary a ontamination, odo	asticity, rocks, oxi	dation, nents,	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)		
٧	Nil	N	D	0.1			xx	FILL - Organ	nics silt, with (gravel, dry.				E	0.05	2863/138/0.05	
v 	Nil	N	D				xx	FILL - Gravelly/c (5-20m	layey sand, a m, 10-20%), i	ngular grave moist.	ls			E	_	2863/138/ 0.5	
V	Nil	N	D	1.0 - - -		P 9	EW	EXTREMELY WEAI properties, coarse gra	K SANDSTOI ained, rounde	NE - Gravely d quartzite g	sand ravels.			В	1.4	2863/138/ 1.0 2863/138/ 1.4	1
E	I N		/ /ME*	re S	SUPPORT SUPPOR	WATER N Nor	ne obse	MOISTURE PENE rved D Dry L Lo	TRATION CON		ENSITY Very Loose	SAMPLII A Auge		STING		Pocket penetrometer Standard penetration	
F C V	IA Ha L Au CC Co ' V-I	and au uger increte Bit ngsten	Core		RB Rock Bolt Nil No suppo			Wp Plastic limit R Re low WI Liquid limit	efusal St VSt H	Stiff D	D Medium Dens Dense Very Dense		sample (nple ent x mm)	DC FD	S Vane shear CP Dynamic cone penetrometer O Field density S Water sample	Y USCS N Agricultural
۲	ı Pl	ioi i i ili	ric .		E	XCAVATI	ION LO	OG TO BE READ IN CONJU	JNCTION WITH	H ACCOMPAN	YING REPOR	T NOTES A	AND AB	BREV	'IATIC	DNS	
			_							ASSOCIATES							

Attachment C - Laboratory Analytical Certificates 9



57 Herbert St Artarmon NSW 2064

email: artarmon@ghd.com.au web: www.ghd.com.au/ghdgeotechnics

Tel: (02) 9462 4860 Fax:(02) 9462 4710

Report No: SYD1212245

Issue No: 1

Material Test Report

Client: Martens Consulting Engineers

Unit 6 / 37 Leighton Place Hornsby NSW 2077

Project: 2116124 P1002863



This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO IEC 17025 Laboratory Accreditation No. 679

B

D.P Brooke (Sydney Laboratory Manager)

Date of Issue: 16/10/2012

THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULL.

Sample Details

Sample ID SYD12-15022

Client Sample ID

Date Sampled 24/09/2012

Specification

Location P1002863

Sampled By Sampled by client

Boring No. 101 Depth 0.25m Soil Description CLAY

Test Results

Description	Method	Result Limits
Sample History	AS 1289.1.1	Oven-dried
Preparation	AS 1289.1.1	Dry Sieved
Linear Shrinkage (%)	AS 1289.3.4.1	N/A
Mould Length (mm)		0
Crumbling		No
Curling		No
Liquid Limit (%)	AS 1289.3.1.1	65
Method		Four Point
Plastic Limit (%)	AS 1289.3.2.1	25
Plasticity Index (%)	AS 1289.3.3.1	40

Comments

57 Herbert St Artarmon NSW 2064

email: artarmon@ghd.com.au web: www.ghd.com.au/ghdgeotechnics

Tel: (02) 9462 4860 Fax:(02) 9462 4710

Report No: SYD1212251

Issue No: 1

Material Test Report

Client: Martens Consulting Engineers

Unit 6 / 37 Leighton Place Hornsby NSW 2077

Project: 2116124 P1002863



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D.P Brooke (Sydney Laboratory Manager)

Date of Issue: 16/10/2012

THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULL.

Sample Details

Sample ID SYD12-15028

Client Sample ID

Date Sampled 24/09/2012

Specification

Location P1002863

Sampled By Sampled by client

Boring No. 118
Depth 1.0m
Soil Description CLAY: grey

Test Results

Description	Method	Result Limits
Emerson Class Number	AS 1289.3.8.1	4
Soil Description		CLAY: Grey
Type of Water		Distilled
Temperature of Water (°C)		21

Comments

57 Herbert St Artarmon NSW 2064

email: artarmon@ghd.com.au web: www.ghd.com.au/ghdgeotechnics

Tel: (02) 9462 4860 Fax:(02) 9462 4710

Report No: SYD1212252

Issue No: 1

Material Test Report

Client: Martens Consulting Engineers

Unit 6 / 37 Leighton Place Hornsby NSW 2077

Project: 2116124 P1002863



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B----

D.P Brooke (Sydney Laboratory Manager)

Date of Issue: 16/10/2012

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Sample Details

Sample ID SYD12-15029

Client Sample ID

Date Sampled 24/09/2012

Specification

Location P1002863

Sampled By Sampled by client

Boring No. 128 **Depth** 0.2-0.3m

Soil Description SAND: light brown with clay

Test Results

Description	Method	Result Limits
Emerson Class Number	AS 1289.3.8.1	4
Soil Description		SAND: Light Brown
Type of Water		Distilled
Temperature of Water (°C)		21

Comments

57 Herbert St Artarmon NSW 2064

email: artarmon@ghd.com.au

web: www.ghd.com.au/ghdgeotechnics

Tel: (02) 9462 4860 Fax:(02) 9462 4710

Report No: SYD1212241

Issue No: 1

Material Test Report

Client: Martens Consulting Engineers

Unit 6 / 37 Leighton Place Hornsby NSW 2077

Project: 2116124 P1002863



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B-1

D.P Brooke (Sydney Laboratory Manager)

Date of Issue: 16/10/2012

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Sample Details

Sample ID SYD12-15018

Client Sample ID

Date Sampled 24/09/2012

Specification

Location P1002863

Sampled By Sampled by client

Boring No. CBR 110

Depth

Soil Description Sandy CLAY / Clayey SAND trace gravel

Test Results

Description	Method	Result	Limits
Standard Maximum Dry Density (t/m³)	AS 1289.5.1.1	1.83	
Standard Optimum Moisture Content (%)		17.5	
Oversize Sieve (mm)		-19.0	
Oversize Material (%)		0	
CBR At 2.5	AS 1289.6.1.1	14	
CBR At 5.0		12	
Laboratory Moisture Ratio		99	
Laboratory Density Ratio		99	
Moisture Content Top 30mm (%)		18.9	
Moisture Content of Remaining Depth (%)		17.4	
Swell (%)		0.1	
Dry Density After Soaking (t/m³)		1.815	
Oversize Material		Excluded	
Oversize Material (%)		3.1	
Surcharge Mass (g)		4.5	
Compactive Effort		Standard	
Period of Soaking (Days)		4	

Comments

57 Herbert St Artarmon NSW 2064

email: artarmon@ghd.com.au

web: www.ghd.com.au/ghdgeotechnics Tel: (02) 9462 4860

Tel: (02) 9462 4860 Fax:(02) 9462 4710

Report No: SYD1212242

Issue No: 1

Material Test Report

Client: Martens Consulting Engineers

Unit 6 / 37 Leighton Place Hornsby NSW 2077

Project: 2116124 P1002863



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B-1

D.P Brooke (Sydney Laboratory Manager)

Date of Issue: 16/10/2012

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Sample Details

Sample ID SYD12-15019

Client Sample ID

Date Sampled 24/09/2012

Specification

Location P1002863

Sampled By Sampled by client

Boring No. CBR 117

Depth

Soil Description CLAY

Test Results

Description	Method	Result	Limits
Standard Maximum Dry Density (t/m³)	AS 1289.5.1.1	1.89	
Standard Optimum Moisture Content (%)		13.0	
Oversize Sieve (mm)		-19.0	
Oversize Material (%)		0	
CBR At 2.5	AS 1289.6.1.1	4.0	
CBR At 5.0		4.5	
Laboratory Moisture Ratio		101	
Laboratory Density Ratio		98	
Moisture Content Top 30mm (%)		14.6	
Moisture Content of Remaining Depth (%)		14.5	
Swell (%)		0.0	
Dry Density After Soaking (t/m³)		1.847	
Oversize Material		Replaced	
Oversize Material (%)		0.0	
Surcharge Mass (g)		4.5	
Compactive Effort		Standard	
Period of Soaking (Days)		4	

Comments

57 Herbert St Artarmon NSW 2064

email: artarmon@ghd.com.au web: www.ghd.com.au/ghdgeotechnics

Tel: (02) 9462 4860 Fax:(02) 9462 4710

Report No: SYD1212248

Issue No: 1

Material Test Report

Client: Martens Consulting Engineers

Unit 6 / 37 Leighton Place Hornsby NSW 2077

Project: 2116124 P1002863



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B-1

D.P Brooke (Sydney Laboratory Manager)

Date of Issue: 16/10/2012

THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULL.

Sample Details

Sample ID SYD12-15025

Client Sample ID

Date Sampled 24/09/2012

Specification

Location P1002863

Sampled By Sampled by client

Boring No. 103 Depth 0.4m

Soil Description CLAY: brown

Test Results

Description	Method	Result Limits
Emerson Class Number	AS 1289.3.8.1	4
Soil Description		CLAY: Brown
Type of Water		Distilled
Temperature of Water (°C)		21

Comments

57 Herbert St Artarmon NSW 2064

email: artarmon@ghd.com.au web: www.ghd.com.au/ghdgeotechnics

Tel: (02) 9462 4860 Fax:(02) 9462 4710

Report No: SYD1212240

Issue No: 1

Material Test Report

Client: Martens Consulting Engineers

Unit 6 / 37 Leighton Place Hornsby NSW 2077

Project: 2116124 P1002863



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B-1

D.P Brooke (Sydney Laboratory Manager)

Date of Issue: 16/10/2012

THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULL.

Sample Details

Sample ID SYD12-15017

Client Sample ID

Date Sampled 24/09/2012

Specification

Location P1002863

Sampled By Sampled by client

Boring No. CBR 106

Depth

Soil Description CLAY

Test Results

Description	Method	Result	Limits
Standard Maximum Dry Density (t/m³)	AS 1289.5.1.1	1.67	
Standard Optimum Moisture Content (%)		18.0	
Oversize Sieve (mm)		-19.0	
Oversize Material (%)		0	
CBR At 2.5	AS 1289.6.1.1	2.0	
CBR At 5.0		2.0	
Laboratory Moisture Ratio		99	
Laboratory Density Ratio		99	
Moisture Content Top 30mm (%)		25.1	
Moisture Content of Remaining Depth (%)		24.2	
Swell (%)		3.8	
Dry Density After Soaking (t/m³)		1.590	
Oversize Material		Excluded	
Oversize Material (%)		0.0	
Surcharge Mass (g)		4.5	
Compactive Effort		Standard	
Period of Soaking (Days)		4	

Comments

57 Herbert St Artarmon NSW 2064

email: artarmon@ghd.com.au web: www.ghd.com.au/ghdgeotechnics

Tel: (02) 9462 4860 Fax:(02) 9462 4710

Report No: SYD1212243

Issue No: 1

Material Test Report

Client: Martens Consulting Engineers

Unit 6 / 37 Leighton Place Hornsby NSW 2077

Project: 2116124 P1002863



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B-1

D.P Brooke (Sydney Laboratory Manager)

Date of Issue: 16/10/2012

THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULL.

Sample Details

Sample ID SYD12-15020

Client Sample ID

Date Sampled 24/09/2012

Specification

Location P1002863

Sampled By Sampled by client

Boring No. CBR 125

Depth

Soil Description Sandy CLAY

Test Results

Description	Method	Result	Limits
Standard Maximum Dry Density (t/m³)	AS 1289.5.1.1	1.83	
Standard Optimum Moisture Content (%)		13.5	
Oversize Sieve (mm)		-19.0	
Oversize Material (%)		0	
CBR At 2.5	AS 1289.6.1.1	11	
CBR At 5.0		13	
Laboratory Moisture Ratio		97	
Laboratory Density Ratio		98	
Moisture Content Top 30mm (%)		15.9	
Moisture Content of Remaining Depth (%)		14.9	
Swell (%)		0.0	
Dry Density After Soaking (t/m³)		1.797	
Oversize Material		Excluded	
Oversize Material (%)		0.0	
Surcharge Mass (g)		4.5	
Compactive Effort		Standard	
Period of Soaking (Days)		4	

Comments

57 Herbert St Artarmon NSW 2064

email: artarmon@ghd.com.au web: www.ghd.com.au/ghdgeotechnics

Tel: (02) 9462 4860 Fax:(02) 9462 4710

Report No: SYD1212246

Issue No: 1

Material Test Report

Client: Martens Consulting Engineers

Unit 6 / 37 Leighton Place Hornsby NSW 2077

Project: 2116124 P1002863



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B-1

D.P Brooke (Sydney Laboratory Manager)

Date of Issue: 16/10/2012

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Sample Details

Sample ID SYD12-15023

Client Sample ID

Date Sampled 24/09/2012

Specification

Location P1002863

Sampled By Sampled by client

Boring No. 106 Depth 0.4m Soil Description CLAY

Test Results

Description	Method	Result Limits
Sample History	AS 1289.1.1	Oven-dried
Preparation	AS 1289.1.1	Dry Sieved
Linear Shrinkage (%)	AS 1289.3.4.1	N/A
Mould Length (mm)		0
Crumbling		No
Curling		No
Liquid Limit (%)	AS 1289.3.1.1	65
Method		Four Point
Plastic Limit (%)	AS 1289.3.2.1	25
Plasticity Index (%)	AS 1289.3.3.1	40

Comments

57 Herbert St Artarmon NSW 2064

email: artarmon@ghd.com.au

web: www.ghd.com.au/ghdgeotechnics Tel: (02) 9462 4860

Fax:(02) 9462 4710

Report No: SYD1212244

Issue No: 1

Material Test Report

Client: Martens Consulting Engineers

Unit 6 / 37 Leighton Place Hornsby NSW 2077

Project: 2116124 P1002863



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B-1

D.P Brooke (Sydney Laboratory Manager)

Date of Issue: 16/10/2012

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Sample Details

Sample ID SYD12-15021

Client Sample ID

Date Sampled 24/09/2012

Specification

Location P1002863

Sampled By Sampled by client

Boring No. CBR 128

Depth

Soil Description Sandy CLAY

Test Results

Description	Method	Result	Limits
Standard Maximum Dry Density (t/m³)	AS 1289.5.1.1	1.95	
Standard Optimum Moisture Content (%)		11.5	
Oversize Sieve (mm)		-19.0	
Oversize Material (%)		0	
CBR At 2.5	AS 1289.6.1.1	8	
CBR At 5.0		11	
Laboratory Moisture Ratio		99	
Laboratory Density Ratio		97	
Moisture Content Top 30mm (%)		14.0	
Moisture Content of Remaining Depth (%)		13.6	
Swell (%)		0.1	
Dry Density After Soaking (t/m³)		1.885	
Oversize Material		Excluded	
Oversize Material (%)		0.0	
Surcharge Mass (g)		4.5	
Compactive Effort		Standard	
Period of Soaking (Days)		4	

Comments

57 Herbert St Artarmon NSW 2064

email: artarmon@ghd.com.au web: www.ghd.com.au/ghdgeotechnics

Tel: (02) 9462 4860 Fax:(02) 9462 4710

Report No: SYD1212250

Issue No: 1

Material Test Report

Client: Martens Consulting Engineers

Unit 6 / 37 Leighton Place Hornsby NSW 2077

Project: 2116124 P1002863



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B-1

D.P Brooke (Sydney Laboratory Manager)

Date of Issue: 16/10/2012

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Sample Details

Sample ID SYD12-15027

Client Sample ID

Date Sampled24/09/2012Specification26.5 MaxLocationP1002863Sampled BySampled by client

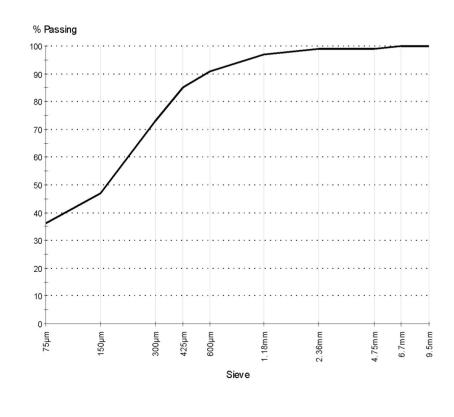
Boring No. 118 Depth 0.3m

Soil Description Clayey SAND : yellow brown

Other Test Results

Description	Method	Result	Limits
Emerson Class Number	AS 1289.3.8.1	4	
Soil Description	clay	ey SAND	
Type of Water		Distilled	
Temperature of Water (°C)		21	

Particle Size Distribution



Method: AS 1289.3.6.1 Drying by: Oven

Note: Sample Washed

Sieve Size	% Passing	Limits
9.5mm	100	
6.7mm	100	
4.75mm	99	
2.36mm	99	
1.18mm	97	
600µm	91	
425µm	85	
300µm	73	
150µm	47	
75µm	36	

Comments

57 Herbert St Artarmon NSW 2064

email: artarmon@ghd.com.au web: www.ghd.com.au/ghdgeotechnics

Tel: (02) 9462 4860 Fax:(02) 9462 4710

Report No: SYD1212247

Issue No: 1

Material Test Report

Client: Martens Consulting Engineers

Unit 6 / 37 Leighton Place Hornsby NSW 2077

Project: 2116124 P1002863



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B-1

D.P Brooke (Sydney Laboratory Manager)

Date of Issue: 16/10/2012

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Sample Details

Sample ID SYD12-15024

Client Sample ID

Date Sampled 24/09/2012

Specification

Location P1002863

Sampled By Sampled by client

Boring No. 109 **Depth** 0.05m

Soil Description CLAY: brown

Test Results

Description	Method	Result Limits
Emerson Class Number	AS 1289.3.8.1	8
Soil Description		CLAY: Brown
Type of Water		Distilled
Temperature of Water (°C)		21

Comments

57 Herbert St Artarmon NSW 2064

email: artarmon@ghd.com.au web: www.ghd.com.au/ghdgeotechnics

Tel: (02) 9462 4860 Fax:(02) 9462 4710

Report No: SYD1212249

Issue No: 1

Material Test Report

Client: Martens Consulting Engineers

Unit 6 / 37 Leighton Place Hornsby NSW 2077

Project: 2116124 P1002863



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D.P Brooke (Sydney Laboratory Manager)

Date of Issue: 16/10/2012

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Sample Details

Sample ID SYD12-15026

Client Sample ID

Date Sampled 24/09/2012 **Specification** 26.5 Max Location P1002863 Sampled By Sampled by client

Boring No. 117 Depth 1.0m

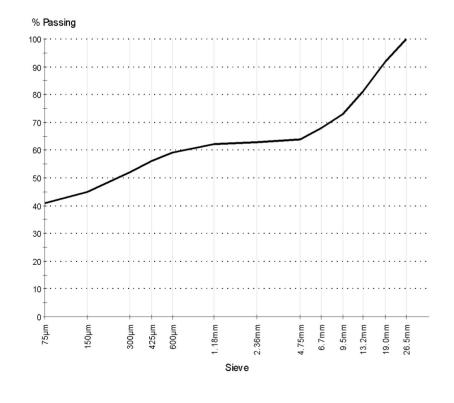
Soil Description Clayey SAND with gravel (see

Description

Other Test Results

Method Result Limits

Particle Size Distribution



Method: AS 1289.3.6.1

Drying by:

Sample Washed Note:

Sieve Size	% Passing
26.5mm	100
19.0mm	92
13.2mm	81
9.5mm	73
6.7mm	68
4.75mm	64
2.36mm	63
1.18mm	62
600µm	59
425µm	56
300µm	52
150µm	45
75µm	41

Insufficient sample mass to comply with minimum mass requirements. Gravel portion may be over represented due to small sample mass

Limits



Envirolab Services Pty Ltd

ABN 37 112 535 645 12 Ashley St Chatswood NSW 2067 ph 02 9910 6200 fax 02 9910 6201 enquiries@envirolabservices.com.au www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 79298

Client:

Martens & Associates Pty Ltd 6/37 Leighton Place

Hornsby NSW 2077

Attention: Ben McGiffin

Sample log in details:

Your Reference: 2863-soil and material sampling-Mura

No. of samples: 50 Soils, 3 Materials

Date samples received / completed instructions received 24/09/2012, 25/09/1224/09/2012, 25/09/12

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date: 3/10/12 / 3/10/12

Date of Preliminary Report: Not issued

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Results Approved By:

Nick Sarlamis
Inorganics Supervisor

Alex MacLean Chemist

Paul Ching Approved Signatory



vTRH&BTEX in Soil						
Our Reference:	UNITS	79298-1	79298-2	79298-3	79298-4	79298-5
Your Reference		2863/132	2863/131	2863/Dup4	2863/129	2863/128
Depth		0.05	0.05	-	0.05	0.05
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date analysed	-	29/09/2012	29/09/2012	29/09/2012	29/09/2012	29/09/2012
vTRHC6 - C9	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	87	99	99	100	99
vTRH & BTEX in Soil Our Reference:	UNITS	79298-6	79298-7	79298-8	79298-9	79298-11
Your Reference	UNITS	79298-6 2863/130	79298-7 2863/134	79298-8 2863/133	79298-9 2863/118	2863/117
Depth		0.05	2003/134	0.05	0.05	0.3
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date analysed	-	29/09/2012	29/09/2012	29/09/2012	29/09/2012	29/09/2012
vTRHC6 - C9	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	99	100	99	93	109
	<u> </u>		<u> </u>		<u> </u>	<u> </u>
vTRH&BTEX in Soil	LINITTO	70000 10	70000 4 4	70000 45	70000 40	70000 10
Our Reference: Your Reference	UNITS	79298-13 2863/SS119	79298-14	79298-15 2863/116	79298-16 2863/103	79298-19 2863/125
Depth		2003/33119	2863/SS122 -	0.15	0.25	0.3
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date analysed	-	29/09/2012	29/09/2012	29/09/2012	29/09/2012	29/09/2012
vTRHC6 - C9	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	105	95	81	101	100
Surrogate adas militorotoliterile	/0	100		J 01	101	100

Envirolab Reference: 79298 Revision No: R 01

vTRH&BTEX in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS	79298-20 2863/Dup3 - 19/09/2012 Soil	79298-21 2863/101 0.05 19/09/2012 Soil	79298-22 2863/107 0.05 19/09/2012 Soil	79298-23 2863/121 0.05 19/09/2012 Soil	79298-24 2863/137 0.15 19/09/2012 Soil
Date extracted	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date analysed	-	29/09/2012	29/09/2012	29/09/2012	29/09/2012	29/09/2012
vTRHC6 - C9	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	105	99	103	105	124
vTRH&BTEX in Soil Our Reference: Your Reference Depth Date Sampled	UNITS	79298-25 2863/102 1.5 19/09/2012	79298-26 2863/Dup2 - 19/09/2012	79298-27 2863/103 1.2 19/09/2012	79298-28 2863/SS114 - 19/09/2012	79298-29 2863/105 0.2 19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date analysed	-	29/09/2012	29/09/2012	29/09/2012	29/09/2012	29/09/2012
vTRHC6 - C9	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	102	96	96	101	107
vTRH&BTEXin Soil Our Reference: Your Reference Depth Date Sampled	UNITS	79298-31 2863/108 1.0 19/09/2012	79298-32 2863/136 0.2 19/09/2012	79298-33 2863/123 0.1 19/09/2012	79298-34 2863/120 0.2 19/09/2012	79298-35 2863/138 0.5 19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	_	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date analysed	_	29/09/2012	29/09/2012	29/09/2012	29/09/2012	29/09/2012
vTRHC6 - C9	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	107	111	108	104	117
Sarrogato add Tillidolotoldollo		L	L	1		l

vTRH & BTEX in Soil						
Our Reference:	UNITS	79298-36	79298-37	79298-38	79298-39	79298-40
Your Reference		2863/116	2863/111	2863/112	2863/113	2863/104
Depth		0.05	0.25	0.5	0.4	0.3
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date analysed	-	29/09/2012	29/09/2012	29/09/2012	29/09/2012	29/09/2012
vTRHC6 - C9	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	96	107	104	110	108

vTRH&BTEX in Soil						
Our Reference:	UNITS	79298-46	79298-47	79298-48	79298-49	79298-51
Your Reference		MA Blank 1	MA Spike 1	MA Blank 2	MA Spike 2	2863/126
Depth		-	-	-	-	0.25
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date analysed	-	29/09/2012	29/09/2012	29/09/2012	29/09/2012	29/09/2012
vTRHC6 - C9	mg/kg	<25	[NA]	<25	[NA]	<25
Benzene	mg/kg	<0.2	101%	<0.2	107%	<0.2
Toluene	mg/kg	<0.5	101%	<0.5	107%	<0.5
Ethylbenzene	mg/kg	<1	102%	<1	106%	<1
m+p-xylene	mg/kg	<2	101%	<2	105%	<2
o-Xylene	mg/kg	<1	101%	<1	106%	<1
Surrogate aaa-Trifluorotoluene	%	109	103	103	104	114

sTRH in Soil (C10-C36)						
Our Reference:	UNITS	79298-1	79298-2	79298-3	79298-4	79298-5
Your Reference		2863/132	2863/131	2863/Dup4	2863/129	2863/128
Depth		0.05	0.05	-	0.05	0.05
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date analysed	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
TRHC 10 - C14	mg/kg	<50	<50	<50	<50	<50
TRHC 15 - C28	mg/kg	110	<100	<100	<100	<100
TRHC29 - C36	mg/kg	140	<100	110	120	<100
Surrogate o-Terphenyl	%	89	86	84	88	86
Surrogate 0-Telphenyi	70	05	00	04	00	00
sTRH in Soil (C10-C36)						
Our Reference:	UNITS	79298-6	79298-7	79298-8	79298-9	79298-11
Your Reference		2863/130	2863/134	2863/133	2863/118	2863/117
Depth		0.05	-	0.05	0.05	0.3
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date analysed	_	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRHC15 - C28	mg/kg	<100	<100	<100	<100	<100
TRHC29 - C36		<100	150	150	<100	<100
	mg/kg %	83	92		86	86
Surrogate o-Terphenyl	70	03	92	88	00	00
sTRH in Soil (C10-C36)						
Our Reference:	UNITS	79298-13	79298-14	79298-15	79298-16	79298-19
Your Reference		2863/SS119	2863/SS122	2863/116	2863/103	2863/125
Depth		-	-	0.15	0.25	0.3
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date analysed	_	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
TRHC10 - C14	mg/kg	<50	<50	<50	<50	<50
TRHC 15 - C28	mg/kg	<100	<100	<100	<100	<100
		<100	<100	<100	<100	<100
TRHC29 - C36	mg/kg					
Surrogate o-Terphenyl	%	86	83	76	80	81
sTRH in Soil (C10-C36)						
Our Reference:	UNITS	79298-20	79298-21	79298-22	79298-23	79298-24
Your Reference		2863/Dup3	2863/101	2863/107	2863/121	2863/137
Depth		-	0.05	0.05	0.05	0.15
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date extracted		i .	l		07/00/0040	07/00/0040
	_	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date analysed	- ma/ka		27/09/2012 <50	27/09/2012 <50		
Date analysed TRHC10 - C14	- mg/kg ma/ka	<50	<50	<50	<50	<50
Date analysed TRHC10 - C14 TRHC15 - C28	mg/kg	<50 <100	<50 <100	<50 <100	<50 <100	<50 <100
Date analysed TRHC10 - C14		<50	<50	<50	<50	<50

	Client Refere	nce: 2863	-soil and mate	erial sampling	-Mura	
sTRH in Soil (C10-C36) Our Reference: Your Reference Depth Date Sampled	UNITS	79298-25 2863/102 1.5 19/09/2012	79298-26 2863/Dup2 - 19/09/2012	79298-27 2863/103 1.2 19/09/2012	79298-28 2863/SS114 - 19/09/2012	79298-29 2863/105 0.2 19/09/2012
Type of sample Date extracted	-	Soil 27/09/2012	Soil 27/09/2012	Soil 27/09/2012	Soil 27/09/2012	Soil 27/09/2012
Date analysed TRHC10 - C14	- mg/kg	27/09/2012 <50	27/09/2012 <50	27/09/2012 <50	27/09/2012 <50	27/09/2012 <50
TRHC15 - C28 TRHC29 - C36 Surrogate o-Terphenyl	mg/kg mg/kg %	<100 180 83	<100 240 82	130 110 85	<100 <100 85	<100 100 67
sTRH in Soil (C10-C36)						
Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS	79298-31 2863/108 1.0 19/09/2012 Soil	79298-32 2863/136 0.2 19/09/2012 Soil	79298-33 2863/123 0.1 19/09/2012 Soil	79298-34 2863/120 0.2 19/09/2012 Soil	79298-35 2863/138 0.5 19/09/2012 Soil
Date extracted Date analysed	-	27/09/2012 27/09/2012	27/09/2012 27/09/2012	27/09/2012 27/09/2012	27/09/2012 27/09/2012	27/09/2012 27/09/2012
TRHC 10 - C14 TRHC 15 - C28 TRHC 29 - C36	mg/kg mg/kg mg/kg	<50 <100 <100	<50 <100 <100	<50 <100 <100	<50 <100 <100	<50 <100 <100
Surrogate o-Terphenyl	%	66	77	75	65	79
sTRHin Soil (C10-C36) Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS	79298-36 2863/116 0.05 19/09/2012 Soil	79298-37 2863/111 0.25 19/09/2012 Soil	79298-38 2863/112 0.5 19/09/2012 Soil	79298-39 2863/113 0.4 19/09/2012 Soil	79298-40 2863/104 0.3 19/09/2012 Soil
Date extracted Date analysed	-	27/09/2012 27/09/2012	27/09/2012 27/09/2012	27/09/2012 27/09/2012	27/09/2012 27/09/2012	27/09/2012 27/09/2012
TRHC 10 - C14 TRHC 15 - C28 TRHC 29 - C36	mg/kg mg/kg mg/kg	<50 <100 610	<50 <100 <100	<50 <100 <100	<50 <100 <100	<50 <100 120
Surrogate o-Terphenyl	%	72	72	71	72	67
sTRH in Soil (C10-C36) Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS	79298-51 2863/126 0.25 19/09/2012 Soil				
Date extracted		27/09/2012	1			

STREETITSOII(C10-C30)		
Our Reference:	UNITS	79298-51
Your Reference		2863/126
Depth		0.25
Date Sampled		19/09/2012
Type of sample		Soil
Date extracted	-	27/09/2012
Date analysed	-	27/09/2012
TRHC 10 - C14	mg/kg	<50
TRHC 15 - C28	mg/kg	<100
TRHC29 - C36	mg/kg	<100
Surrogate o-Terphenyl	%	81

PAHs in Soil						
Our Reference:	UNITS	79298-1	79298-2	79298-3	79298-4	79298-5
Your Reference		2863/132	2863/131	2863/Dup4	2863/129	2863/128
Depth		0.05	0.05	-	0.05	0.05
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date analysed	-	29/09/2012	29/09/2012	29/09/2012	29/09/2012	29/09/2012
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d ₁₄	%	91	95	97	95	98
3 , 1 ,						
PAHs in Soil						
Our Reference:	UNITS	79298-6	79298-7	79298-8	79298-9	79298-11
Our Reference: Your Reference		2863/130	79298-7 2863/134	2863/133	2863/118	2863/117
Our Reference: Your Reference Depth	UNITS	2863/130 0.05	2863/134	2863/133 0.05	2863/118 0.05	2863/117 0.3
Our Reference: Your Reference		2863/130		2863/133	2863/118	2863/117
Our Reference: Your Reference Depth Date Sampled Type of sample		2863/130 0.05 19/09/2012 Soil	2863/134 - 19/09/2012 Soil	2863/133 0.05 19/09/2012 Soil	2863/118 0.05 19/09/2012 Soil	2863/117 0.3 19/09/2012 Soil
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted		2863/130 0.05 19/09/2012 Soil 27/09/2012	2863/134 - 19/09/2012 Soil 27/09/2012	2863/133 0.05 19/09/2012 Soil 27/09/2012	2863/118 0.05 19/09/2012 Soil 27/09/2012	2863/117 0.3 19/09/2012 Soil 27/09/2012
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed	-	2863/130 0.05 19/09/2012 Soil 27/09/2012 29/09/2012	2863/134 - 19/09/2012 Soil 27/09/2012 29/09/2012	2863/133 0.05 19/09/2012 Soil 27/09/2012 29/09/2012	2863/118 0.05 19/09/2012 Soil 27/09/2012 29/09/2012	2863/117 0.3 19/09/2012 Soil 27/09/2012 29/09/2012
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene		2863/130 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1	2863/134 - 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1	2863/133 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1	2863/118 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1	2863/117 0.3 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene	- - - mg/kg mg/kg	2863/130 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1	2863/134 - 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1	2863/133 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1	2863/118 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1	2863/117 0.3 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene	- - - mg/kg mg/kg mg/kg	2863/130 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1	2863/134 - 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1	2863/133 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1	2863/118 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1	2863/117 0.3 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Fluorene		2863/130 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1	2863/134 - 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1	2863/133 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1	2863/118 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1	2863/117 0.3 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene		2863/130 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1	2863/134 - 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1	2863/133 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1	2863/118 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1	2863/117 0.3 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene		2863/130 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/134 - 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/133 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1	2863/118 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/117 0.3 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene	- mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	2863/130 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/134 - 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/133 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/118 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/117 0.3 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene		2863/130 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/134 - 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/133 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/118 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/117 0.3 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene	- mg/kg	2863/130 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/134 - 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/133 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/118 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/117 0.3 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene		2863/130 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/134 - 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/133 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/118 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/117 0.3 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b+k)fluoranthene	mg/kg	2863/130 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/134 - 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/133 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/118 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/117 0.3 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b+k)fluoranthene Benzo(a)pyrene		2863/130 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/134 - 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/133 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/118 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/117 0.3 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b+k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-c,d)pyrene	mg/kg	2863/130 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/134 - 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/133 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/118 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/117 0.3 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b+k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-c,d)pyrene Dibenzo(a,h)anthracene	mg/kg	2863/130 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/134 - 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/133 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/118 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/117 0.3 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b+k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-c,d)pyrene	mg/kg	2863/130 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/134 - 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/133 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/118 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/117 0.3 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1

PAHs in Soil						
Our Reference:	UNITS	79298-13	79298-14	79298-15	79298-16	79298-19
Your Reference		2863/SS119	2863/SS122	2863/116	2863/103	2863/125
Depth		-	-	0.15	0.25	0.3
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date analysed	-	29/09/2012	29/09/2012	29/09/2012	29/09/2012	29/09/2012
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene		<0.1	<0.1	<0.1	<0.1	<0.1
	mg/kg					
Surrogate p-Terphenyl-d ₁₄	%	99	80	84	87	90
PAHs in Soil						
PAHs in Soil Our Reference:	UNITS	79298-20	79298-21	79298-22	79298-23	79298-24
	UNITS	79298-20 2863/Dup3	79298-21 2863/101	79298-22 2863/107	79298-23 2863/121	79298-24 2863/137
Our Reference: Your Reference Depth						
Our Reference: Your Reference Depth Date Sampled		2863/Dup3 - 19/09/2012	2863/101 0.05 19/09/2012	2863/107 0.05 19/09/2012	2863/121 0.05 19/09/2012	2863/137 0.15 19/09/2012
Our Reference: Your Reference Depth		2863/Dup3 -	2863/101 0.05	2863/107 0.05	2863/121 0.05	2863/137 0.15
Our Reference: Your Reference Depth Date Sampled		2863/Dup3 - 19/09/2012	2863/101 0.05 19/09/2012	2863/107 0.05 19/09/2012	2863/121 0.05 19/09/2012	2863/137 0.15 19/09/2012
Our Reference: Your Reference Depth Date Sampled Type of sample		2863/Dup3 - 19/09/2012 Soil	2863/101 0.05 19/09/2012 Soil	2863/107 0.05 19/09/2012 Soil	2863/121 0.05 19/09/2012 Soil	2863/137 0.15 19/09/2012 Soil
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted		2863/Dup3 - 19/09/2012 Soil 27/09/2012	2863/101 0.05 19/09/2012 Soil 27/09/2012	2863/107 0.05 19/09/2012 Soil 27/09/2012	2863/121 0.05 19/09/2012 Soil 27/09/2012	2863/137 0.15 19/09/2012 Soil 27/09/2012
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed		2863/Dup3 - 19/09/2012 Soil 27/09/2012 29/09/2012	2863/101 0.05 19/09/2012 Soil 27/09/2012 29/09/2012	2863/107 0.05 19/09/2012 Soil 27/09/2012 29/09/2012	2863/121 0.05 19/09/2012 Soil 27/09/2012 29/09/2012	2863/137 0.15 19/09/2012 Soil 27/09/2012 29/09/2012
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene		2863/Dup3 - 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1	2863/101 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1	2863/107 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1	2863/121 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1	2863/137 0.15 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene	- - - mg/kg mg/kg	2863/Dup3 - 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1	2863/101 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1	2863/107 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1	2863/121 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1	2863/137 0.15 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene	- - - mg/kg mg/kg mg/kg	2863/Dup3 - 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1	2863/101 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1	2863/107 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1	2863/121 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1	2863/137 0.15 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene	mg/kg mg/kg mg/kg mg/kg mg/kg	2863/Dup3 - 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1	2863/101 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1	2863/107 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1	2863/121 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1	2863/137 0.15 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene	- mg/kg mg/kg mg/kg mg/kg mg/kg	2863/Dup3 - 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1	2863/101 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 0.1	2863/107 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1	2863/121 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1	2863/137 0.15 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	2863/Dup3 - 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/101 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1	2863/107 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/121 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1	2863/137 0.15 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene	- mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	2863/Dup3 - 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/101 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 0.1 <0.1	2863/107 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/121 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/137 0.15 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene	- mg/kg	2863/Dup3 - 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/101 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 0.4 0.4	2863/107 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/121 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/137 0.15 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene		2863/Dup3 - 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/101 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 0.4 0.4 0.2 0.2	2863/107 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/121 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/137 0.15 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b+k)fluoranthene	mg/kg	2863/Dup3 - 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/101 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 0.4 0.4 0.2 0.2 0.3	2863/107 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/121 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/137 0.15 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b+k)fluoranthene Benzo(a)pyrene		2863/Dup3 - 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/101 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 0.4 0.4 0.2 0.2 0.3 0.27	2863/107 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/121 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/137 0.15 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b+k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-c,d)pyrene	mg/kg	2863/Dup3 - 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/101 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 0.1 <0.1 0.4 0.4 0.2 0.2 0.3 0.27 0.1	2863/107 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/121 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/137 0.15 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Fluoranthene Benzo(a)anthracene Chrysene Benzo(b+k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-c,d)pyrene Dibenzo(a,h)anthracene	mg/kg	2863/Dup3 - 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/101 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 0.4 0.4 0.2 0.2 0.3 0.27 0.1 <0.1 <0.1	2863/107 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/121 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/137 0.15 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b+k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-c,d)pyrene	mg/kg	2863/Dup3 - 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/101 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 0.1 <0.1 0.4 0.4 0.2 0.2 0.3 0.27 0.1	2863/107 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/121 0.05 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/137 0.15 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1

PAHs in Soil						
Our Reference:	UNITS	79298-25	79298-26	79298-27	79298-28	79298-29
Your Reference		2863/102	2863/Dup2	2863/103	2863/SS114	2863/105
Depth Date Committee		1.5	-	1.2	-	0.2
Date Sampled Type of sample		19/09/2012 Soil	19/09/2012 Soil	19/09/2012 Soil	19/09/2012 Soil	19/09/2012 Soil
Date extracted	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date analysed	-	29/09/2012	29/09/2012	29/09/2012	29/09/2012	29/09/2012
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	0.5	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	0.4	<0.1	<0.1
Phenanthrene	mg/kg	0.2	0.2	7.6	<0.1	0.3
Anthracene	mg/kg	<0.1	<0.1	1.9	<0.1	<0.1
Fluoranthene	mg/kg	0.3	0.5	11	<0.1	0.6
Pyrene	mg/kg	0.3	0.5	8.7	<0.1	0.7
Benzo(a)anthracene	mg/kg	0.1	0.2	4.2	<0.1	0.3
Chrysene	mg/kg	0.2	0.2	3.5	<0.1	0.4
Benzo(b+k)fluoranthene	mg/kg	0.4	0.5	6.1	<0.2	0.8
Benzo(a)pyrene	mg/kg	0.27	0.38	4.7	<0.05	0.48
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	0.2	2.1	<0.1	0.3
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	0.4	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.1	0.2	1.4	<0.1	0.2
Surrogate p-Terphenyl-d14	%	91	92	93	94	77
_						
PAHs in Soil	LINITTO	70200 24	70200 22	70200 22	70200 24	70200 25
Our Reference:	UNITS	79298-31 2863/108	79298-32 2863/136	79298-33 2863/123	79298-34 2863/120	79298-35 2863/138
Our Reference: Your Reference	UNITS	79298-31 2863/108 1.0	79298-32 2863/136 0.2	79298-33 2863/123 0.1	2863/120	79298-35 2863/138 0.5
Our Reference:	UNITS	2863/108	2863/136	2863/123		2863/138
Our Reference: Your Reference Depth	UNITS	2863/108 1.0	2863/136 0.2	2863/123 0.1	2863/120 0.2	2863/138 0.5
Our Reference: Your Reference Depth Date Sampled	UNITS	2863/108 1.0 19/09/2012	2863/136 0.2 19/09/2012	2863/123 0.1 19/09/2012	2863/120 0.2 19/09/2012	2863/138 0.5 19/09/2012
Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS	2863/108 1.0 19/09/2012 Soil	2863/136 0.2 19/09/2012 Soil	2863/123 0.1 19/09/2012 Soil	2863/120 0.2 19/09/2012 Soil	2863/138 0.5 19/09/2012 Soil
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted	UNITS	2863/108 1.0 19/09/2012 Soil 27/09/2012	2863/136 0.2 19/09/2012 Soil 27/09/2012	2863/123 0.1 19/09/2012 Soil 27/09/2012	2863/120 0.2 19/09/2012 Soil 27/09/2012	2863/138 0.5 19/09/2012 Soil 27/09/2012
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed		2863/108 1.0 19/09/2012 Soil 27/09/2012 29/09/2012	2863/136 0.2 19/09/2012 Soil 27/09/2012 29/09/2012	2863/123 0.1 19/09/2012 Soil 27/09/2012 29/09/2012	2863/120 0.2 19/09/2012 Soil 27/09/2012 29/09/2012	2863/138 0.5 19/09/2012 Soil 27/09/2012 29/09/2012
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene		2863/108 1.0 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1	2863/136 0.2 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1	2863/123 0.1 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1	2863/120 0.2 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1	2863/138 0.5 19/09/2012 Soil 27/09/2012 29/09/2012 0.2
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene	- - - mg/kg mg/kg	2863/108 1.0 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 0.1	2863/136 0.2 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1	2863/123 0.1 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1	2863/120 0.2 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1	2863/138 0.5 19/09/2012 Soil 27/09/2012 29/09/2012 0.2 0.5
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene	- - - mg/kg mg/kg mg/kg	2863/108 1.0 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 0.1 <0.1	2863/136 0.2 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1	2863/123 0.1 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1	2863/120 0.2 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1	2863/138 0.5 19/09/2012 Soil 27/09/2012 29/09/2012 0.2 0.5 0.1
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene	mg/kg mg/kg mg/kg mg/kg	2863/108 1.0 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 0.1 <0.1	2863/136 0.2 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1	2863/123 0.1 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1	2863/120 0.2 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1	2863/138 0.5 19/09/2012 Soil 27/09/2012 29/09/2012 0.2 0.5 0.1 0.4
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene	- mg/kg mg/kg mg/kg mg/kg mg/kg	2863/108 1.0 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 0.1 <0.1 <0.1 <0.1	2863/136 0.2 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1	2863/123 0.1 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1	2863/120 0.2 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1	2863/138 0.5 19/09/2012 Soil 27/09/2012 29/09/2012 0.2 0.5 0.1 0.4 4.9
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene		2863/108 1.0 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 0.1 <0.1 <0.1 <0.1 <0.1	2863/136 0.2 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1	2863/123 0.1 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1	2863/120 0.2 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1	2863/138 0.5 19/09/2012 Soil 27/09/2012 29/09/2012 0.2 0.5 0.1 0.4 4.9 0.8
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene	- mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg	2863/108 1.0 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/136 0.2 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/123 0.1 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/120 0.2 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/138 0.5 19/09/2012 Soil 27/09/2012 29/09/2012 0.2 0.5 0.1 0.4 4.9 0.8 4.0
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene		2863/108 1.0 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.2	2863/136 0.2 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/123 0.1 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/120 0.2 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/138 0.5 19/09/2012 Soil 27/09/2012 29/09/2012 0.2 0.5 0.1 0.4 4.9 0.8 4.0 4.1
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene	- mg/kg	2863/108 1.0 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/136 0.2 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/123 0.1 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/120 0.2 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 0.1 0.1 0.1 <0.1	2863/138 0.5 19/09/2012 Soil 27/09/2012 29/09/2012 0.2 0.5 0.1 0.4 4.9 0.8 4.0 4.1 1.7
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene		2863/108 1.0 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 0.2 0.2 0.1	2863/136 0.2 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/123 0.1 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/120 0.2 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 0.1 0.1 0.1 <0.1 <	2863/138 0.5 19/09/2012 Soil 27/09/2012 29/09/2012 0.2 0.5 0.1 0.4 4.9 0.8 4.0 4.1 1.7 1.6
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b+k)fluoranthene	mg/kg	2863/108 1.0 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 0.2 0.2 0.4	2863/136 0.2 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/123 0.1 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/120 0.2 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 0.1 0.1 <0.1 <	2863/138 0.5 19/09/2012 Soil 27/09/2012 29/09/2012 0.2 0.5 0.1 0.4 4.9 0.8 4.0 4.1 1.7 1.6 2.3
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b+k)fluoranthene Benzo(a)pyrene		2863/108 1.0 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 0.1 <0.1 <0.1 <0.1 <0.1 0.2 0.2 0.1 0.2 0.4 0.37	2863/136 0.2 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/123 0.1 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/120 0.2 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 0.1 0.1 0.1 <0.1 <	2863/138 0.5 19/09/2012 Soil 27/09/2012 29/09/2012 0.2 0.5 0.1 0.4 4.9 0.8 4.0 4.1 1.7 1.6 2.3 2.0
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b+k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-c,d)pyrene	mg/kg	2863/108 1.0 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 0.1 <0.1 <0.1 <0.1 <0.1 0.2 0.2 0.1 0.2 0.4 0.37 0.2	2863/136 0.2 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/123 0.1 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/120 0.2 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 0.1 0.1 <0.1 <	2863/138 0.5 19/09/2012 Soil 27/09/2012 29/09/2012 0.2 0.5 0.1 0.4 4.9 0.8 4.0 4.1 1.7 1.6 2.3 2.0 0.9
Our Reference: Your Reference Depth Date Sampled Type of sample Date extracted Date analysed Naphthalene Acenaphthylene Acenaphthene Fluorene Phenanthrene Anthracene Fluoranthene Fluoranthene Benzo(a)anthracene Chrysene Benzo(b+k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-c,d)pyrene Dibenzo(a,h)anthracene	mg/kg	2863/108 1.0 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 0.1 <0.1 <0.1 <0.1 <0.1 0.2 0.2 0.1 0.2 0.4 0.37 0.2 <0.1	2863/136 0.2 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/123 0.1 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1 <0.1	2863/120 0.2 19/09/2012 Soil 27/09/2012 29/09/2012 <0.1 <0.1 <0.1 <0.1 <0.1 0.1 0.1 <0.1 <	2863/138 0.5 19/09/2012 Soil 27/09/2012 29/09/2012 0.2 0.5 0.1 0.4 4.9 0.8 4.0 4.1 1.7 1.6 2.3 2.0 0.9 0.1

PAHs in Soil						
Our Reference:	UNITS	79298-36	79298-37	79298-38	79298-39	79298-40
Your Reference		2863/116	2863/111	2863/112	2863/113	2863/104
Depth		0.05	0.25	0.5	0.4	0.3
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date analysed	-	29/09/2012	29/09/2012	29/09/2012	29/09/2012	29/09/2012
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.3
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.3
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	0.3
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	0.22
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d14	%	80	82	82	81	71

PAHs in Soil		
Our Reference:	UNITS	79298-51
Your Reference		2863/126
Depth		0.25
Date Sampled		19/09/2012
Type of sample		Soil
Date extracted	-	27/09/2012
Date analysed	-	29/09/2012
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Surrogate p-Terphenyl-d ₁₄	%	61

Organochlorine Pesticides in soil						
Our Reference:	UNITS	79298-7	79298-8	79298-16	79298-25	79298-26
Your Reference		2863/134	2863/133	2863/103	2863/102	2863/Dup2
Depth		-	0.05	0.25	1.5	-
Date Sampled		19/09/2012	19/09/2012 Soil	19/09/2012 Soil	19/09/2012 Soil	19/09/2012
Type of sample		Soil	5011	5011	5011	Soil
Date extracted	-	27/9/2012	27/9/2012	27/9/2012	27/9/2012	27/9/2012
Date analysed	-	29/9/2012	29/9/2012	29/9/2012	29/9/2012	29/9/2012
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	90	102	91	90	91

Organochlorine Pesticides in soil						
Our Reference:	UNITS	79298-27	79298-28	79298-29	79298-31	79298-32
Your Reference		2863/103	2863/SS114	2863/105	2863/108	2863/136
Depth		1.2	-	0.2	1.0	0.2
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/9/2012	27/9/2012	27/9/2012	27/9/2012	27/9/2012
Date analysed	-	29/9/2012	29/9/2012	29/9/2012	29/9/2012	29/9/2012
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	90	98	78	81	85

Organochlorine Pesticides in soil						
Our Reference:	UNITS	79298-33	79298-34	79298-35	79298-36	79298-37
Your Reference		2863/123	2863/120	2863/138	2863/116	2863/111
Depth		0.1	0.2	0.5	0.05	0.25
Date Sampled		19/09/2012 Soil	19/09/2012 Soil	19/09/2012 Soil	19/09/2012 Soil	19/09/2012
Type of sample		5011	5011	5011	5011	Soil
Date extracted	-	27/9/2012	27/9/2012	27/9/2012	27/9/2012	27/9/2012
Date analysed	-	29/9/2012	29/9/2012	29/9/2012	29/9/2012	29/9/2012
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	84	73	63	74	85

Organochlorine Pesticides in soil				
Our Reference:	UNITS	79298-38	79298-39	79298-40
Your Reference		2863/112	2863/113	2863/104
Depth		0.5	0.4	0.3
Date Sampled		19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil
Date extracted	-	27/9/2012	27/9/2012	27/9/2012
Date analysed	-	29/9/2012	29/9/2012	29/9/2012
HCB	mg/kg	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	81	89	81

Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS	79298-7 2863/134 - 19/09/2012 Soil	79298-8 2863/133 0.05 19/09/2012 Soil	79298-16 2863/103 0.25 19/09/2012 Soil	79298-25 2863/102 1.5 19/09/2012 Soil	79298-26 2863/Dup2 - 19/09/2012 Soil
Date extracted	-	27/9/2012	27/9/2012	27/9/2012	27/9/2012	27/9/2012
Date analysed	-	29/9/2012	29/9/2012	29/9/2012	29/9/2012	29/9/2012
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	90	102	91	90	91
			ı			
Organophosphorus Pesticides						
Our Reference:	UNITS	79298-27	79298-28	79298-29	79298-31	79298-32
Your Reference		2863/103	2863/SS114	2863/105	2863/108	2863/136
Depth		1.2	-	0.2	1.0	0.2
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/9/2012	27/9/2012	27/9/2012	27/9/2012	27/9/2012
Date analysed	-	29/9/2012	29/9/2012	29/9/2012	29/9/2012	29/9/2012
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
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Envirolab Reference: 79298 Revision No: R 01

Fenitrothion

Bromophos-ethyl

Ethion

Surrogate TCMX

mg/kg

mg/kg

mg/kg

%

<0.1

<0.1

<0.1

90

<0.1

<0.1

<0.1

98

< 0.1

<0.1

<0.1

78

<0.1

<0.1

<0.1

81

<0.1

<0.1

<0.1

85

Organophosphorus Pesticides

Organophosphorus Pesticides						
Our Reference:	UNITS	79298-33	79298-34	79298-35	79298-36	79298-37
Your Reference		2863/123	2863/120	2863/138	2863/116	2863/111
Depth		0.1	0.2	0.5	0.05	0.25
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/9/2012	27/9/2012	27/9/2012	27/9/2012	27/9/2012
Date analysed	-	29/9/2012	29/9/2012	29/9/2012	29/9/2012	29/9/2012
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	84	73	63	74	85

One and a selection of the selection of				
Organophosphorus Pesticides				
Our Reference:	UNITS	79298-38	79298-39	79298-40
Your Reference		2863/112	2863/113	2863/104
Depth		0.5	0.4	0.3
Date Sampled		19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil
Date extracted	-	27/9/2012	27/9/2012	27/9/2012
Date analysed	-	29/9/2012	29/9/2012	29/9/2012
Diazinon	mg/kg	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	81	89	81

PCBs in Soil						
Our Reference:	UNITS	79298-7	79298-8	79298-16	79298-25	79298-26
Your Reference	014113	2863/134	2863/133	2863/103	2863/102	2863/Dup2
Depth		2003/134	0.05	0.25	1.5	2003/Dup2
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/9/2012	27/9/2012	27/9/2012	27/9/2012	27/9/2012
Date analysed	-	29/9/2012	29/9/2012	29/9/2012	29/9/2012	29/9/2012
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	90	102	91	90	91
Sarrogato Tollyin	,,	- 55	1 .02	<u> </u>	1 33	<u> </u>
PCBs in Soil						
Our Reference:	UNITS	79298-27	79298-28	79298-29	79298-31	79298-32
Your Reference		2863/103	2863/SS114	2863/105	2863/108	2863/136
Depth		1.2	-	0.2	1.0	0.2
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/9/2012	27/9/2012	27/9/2012	27/9/2012	27/9/2012
Date analysed	-	29/9/2012	29/9/2012	29/9/2012	29/9/2012	29/9/2012
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
		<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg					
Surrogate TCLMX	%	90	98	78	81	85
PCBs in Soil						
Our Reference:	UNITS	79298-33	79298-34	79298-35	79298-36	79298-37
Your Reference		2863/123	2863/120	2863/138	2863/116	2863/111
Depth		0.1	0.2	0.5	0.05	0.25
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/9/2012	27/9/2012	27/9/2012	27/9/2012	27/9/2012
Date analysed	_	29/9/2012	29/9/2012	29/9/2012	29/9/2012	29/9/2012
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1242		<0.1	<0.1	<0.1	<0.1	<0.1
	mg/kg					
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	84	73	63	74	85

PCBs in Soil				
Our Reference:	UNITS	79298-38	79298-39	79298-40
Your Reference		2863/112	2863/113	2863/104
Depth		0.5	0.4	0.3
Date Sampled		19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil
Date extracted	-	27/9/2012	27/9/2012	27/9/2012
Date analysed	-	29/9/2012	29/9/2012	29/9/2012
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1
Surrogate TCLMX	%	81	89	81

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Acid Extractable metals in soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS	79298-1 2863/132 0.05 19/09/2012 Soil	79298-2 2863/131 0.05 19/09/2012 Soil	79298-3 2863/Dup4 - 19/09/2012 Soil	79298-4 2863/129 0.05 19/09/2012 Soil	79298-5 2863/128 0.05 19/09/2012 Soil
Type of sample		5011	5011	5011	5011	5011
Date digested	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date analysed	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	12	12	19	3	19
Copper	mg/kg	1	<1	<1	<1	<1
Lead	mg/kg	6	5	6	4	6
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	2	1	1	<1	1
Zinc	mg/kg	5	3	3	2	4
Acid Extractable metals in soil Our Reference: Your Reference Depth	UNITS	79298-6 2863/130 0.05	79298-7 2863/134 -	79298-8 2863/133 0.05	79298-9 2863/118 0.05	79298-11 2863/117 0.3
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date analysed	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	9	9	9	12	16
Copper	mg/kg	<1	<1	1	<1	<1
Lead	mg/kg	6	4	8	5	4
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	<1	<1	2	2	2
Zinc	mg/kg	2	2	6	2	2
Acid Extractable metals in soil Our Reference: Your Reference Depth	UNITS	79298-12 2863/117 1.0 19/09/2012	79298-13 2863/SS119 - 19/09/2012	79298-14 2863/SS122 -	79298-15 2863/116 0.15	79298-16 2863/103 0.25 19/09/2012
Date Sampled Type of sample		19/09/2012 Soil	19/09/2012 Soil	19/09/2012 Soil	19/09/2012 Soil	19/09/2012 Soil
Date digested	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date analysed	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Arsenic	mg/kg	[NA]	5	<4	<4	7
Cadmium	mg/kg	[NA]	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	[NA]	8	11	39	21
Copper	mg/kg	[NA]	2	2	1	26
Lead	mg/kg	[NA]	8	9	7	14
Marcon	, and an /1 can	TA LA T	.0.4	.0.4	.0.4	.0.4

<0.1

1

58

[NA]

[NA]

[NA]

<0.1

2

64

<0.1

3

5

Envirolab Reference: 79298 Revision No: R 01 mg/kg

mg/kg

mg/kg

Mercury

Nickel

Zinc

<0.1

8

41

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Acid Extractable metals in soil Our Reference: Your Reference Depth Date Sampled	UNITS	79298-12 2863/117 1.0 19/09/2012	79298-13 2863/SS119 - 19/09/2012	79298-14 2863/SS122 - 19/09/2012	79298-15 2863/116 0.15 19/09/2012	79298-16 2863/103 0.25 19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Magnesium	mg/kg	220	[NA]	[NA]	[NA]	[NA]
Acid Extractable metals in soil Our Reference: Your Reference Depth Date Sampled	UNITS	79298-17 2863/103 0.4 19/09/2012	79298-18 2863/125 0.05 19/09/2012	79298-19 2863/125 0.3 19/09/2012	79298-20 2863/Dup3 - 19/09/2012	79298-21 2863/101 0.05 19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested Date analysed	- -	27/09/2012 27/09/2012	27/09/2012 27/09/2012	27/09/2012 27/09/2012	27/09/2012 27/09/2012	27/09/2012 27/09/2012
Arsenic	mg/kg	[NA]	[NA]	<4	6	8
Cadmium	mg/kg	[NA]	[NA]	<0.5	<0.5	<0.5
Chromium	mg/kg	[NA]	[NA]	16	20	24
Copper	mg/kg	[NA]	[NA]	<1	38	11
Lead	mg/kg	[NA]	[NA]	4	33	48
Mercury	mg/kg	[NA]	[NA]	<0.1	<0.1	<0.1
Nickel	mg/kg	[NA]	[NA]	2	8	5
Zinc	mg/kg	[NA]	[NA]	1	52	47
Magnesium	mg/kg	2,400	200	[NA]	[NA]	[NA]
Acid Extractable metals in soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS	79298-22 2863/107 0.05 19/09/2012 Soil	79298-23 2863/121 0.05 19/09/2012 Soil	79298-24 2863/137 0.15 19/09/2012 Soil	79298-25 2863/102 1.5 19/09/2012 Soil	79298-26 2863/Dup2 - 19/09/2012 Soil
Date digested	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date analysed	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Arsenic	mg/kg	<4	9	<4	6	7
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	17	24	25	21	19
Copper	mg/kg	<1	3	<1	40	38
Lead	mg/kg	6	9	6	170	170
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	<1	<1	1	7	7
Zinc	mg/kg	4	3	1	200	190

Acid Extractable metals in soil						
Our Reference:	UNITS	79298-27	79298-28	79298-29	79298-31	79298-32
Your Reference		2863/103	2863/SS114	2863/105	2863/108	2863/136
Depth		1.2	-	0.2	1.0	0.2
Date Sampled Type of sample		19/09/2012 Soil	19/09/2012 Soil	19/09/2012 Soil	19/09/2012 Soil	19/09/2012 Soil
Date digested	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date analysed	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Arsenic	mg/kg	6	5	7	8	<4
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	16	8	23	19	15
Copper	mg/kg	19	5	63	22	<1
Lead	mg/kg	43	17	310	21	4
Mercury	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Nickel	mg/kg	5	5	5	4	<1
Zinc	mg/kg	200	310	130	26	1
Acid Extractable metals in soil	_					
Our Reference:	UNITS	79298-33	79298-34	79298-35	79298-36	79298-37
Your Reference Depth		2863/123 0.1	2863/120 0.2	2863/138 0.5	2863/116 0.05	2863/111 0.25
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date analysed	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Arsenic	mg/kg	<4	9	9	<4	5
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	3	30	32	21	23
Copper	mg/kg	<1	14	20	3	44
Lead	mg/kg	5	67	33	6	10
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	<1	4	2	3	2
Zinc	mg/kg	3	81	18	10	13
	3 3					
Acid Extractable metals in soil						
Our Reference:	UNITS	79298-38	79298-39	79298-40	79298-42	79298-51
Your Reference		2863/112	2863/113	2863/104	2863/118	2863/126
Depth Date Sampled		0.5 19/09/2012	0.4 19/09/2012	0.3 19/09/2012	0.3	0.25 19/09/2012
Type of sample		19/09/2012 Soil	Soil	Soil	19/09/2012 Soil	Soil
Date digested	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date analysed	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Arsenic	mg/kg	5	6	7	[NA]	<4
Cadmium	mg/kg	<0.5	<0.5	<0.5	[NA]	<0.5
Chromium	mg/kg	9	17	22	[NA]	37
Copper	mg/kg	8	29	29	[NA]	<1
Lead	mg/kg	15	36	91	[NA]	5
Mercury	mg/kg	<0.1	<0.1	<0.1	[NA]	<0.1
Nickel	mg/kg	4	6	6	[NA]	<1
Zinc	mg/kg	72	57	130	[NA]	_1

mg/kg

23

57

130

[NA]

Zinc

<1

Acid Extractable metals in soil						
Our Reference:	UNITS	79298-38	79298-39	79298-40	79298-42	79298-51
Your Reference		2863/112	2863/113	2863/104	2863/118	2863/126
Depth		0.5	0.4	0.3	0.3	0.25
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Magnesium	mg/kg	[NA]	[NA]	[NA]	180	[NA]

Acid Extractable metals in soil		
Our Reference:	UNITS	79298-54
	UNITS	
Your Reference		2863/132 -
		Triplicate
Depth		0.05
Date Sampled		19/09/2012
Type of sample		Soil
Date digested	-	27/09/2012
Date analysed	-	27/09/2012
Arsenic	mg/kg	<4
Cadmium	mg/kg	<0.5
Chromium	mg/kg	15
Copper	mg/kg	<1
Lead	mg/kg	6
Mercury	mg/kg	<0.1
Nickel	mg/kg	2
Zinc	mg/kg	5
Magnesium	mg/kg	220

T IDI O		T				
Total Phenolics in Soil	LINUTTO	70000 7	70000 0	70000 10	70000 05	70000 00
Our Reference:	UNITS	79298-7	79298-8	79298-16	79298-25	79298-26
Your Reference		2863/134	2863/133	2863/103	2863/102	2863/Dup2
Depth		-	0.05	0.25	1.5	-
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date analysed	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5
Total Phenolics in Soil		I	I			
Our Reference:	UNITS	79298-27	79298-28	79298-29	79298-31	79298-32
Your Reference		2863/103	2863/SS114	2863/105	2863/108	2863/136
Depth		1.2	2003/00114	0.2	1.0	0.2
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date analysed	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5
Total Phenolics in Soil		T	T			
Our Reference:	UNITS	79298-33	79298-34	79298-35	79298-36	79298-37
Your Reference	ONITS	2863/123	2863/120	2863/138	2863/116	2863/111
Depth		0.1	0.2	0.5	0.05	0.25
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		19/09/2012 Soil	19/09/2012 Soil	19/09/2012 Soil	19/09/2012 Soil	19/09/2012 Soil
Date extracted	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date analysed	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5
Total Phenolics in Soil]	
Our Reference:	UNITS	79298-38	79298-39	79298-40		
Your Reference		2863/112	2863/113	2863/104		
Depth		0.5	0.4	0.3		
Date Sampled]	19/09/2012	19/09/2012	19/09/2012		
Type of sample		Soil	Soil	Soil		
Date extracted	_	27/09/2012	27/09/2012	27/09/2012		
Date analysed	_	27/09/2012	27/09/2012	27/09/2012		
Total Phenolics (as Phenol)	ma/ka	<5	<5	<5		
Total Friendics (as Priend)	mg/kg	<2	<2	<0	1	

Moisture Our Reference Dur Reference Dur Reference Depth Our Sampled Soil Soil Dete Sampled Determined Determi			T	T	T	T	
Your Reference Depth 2863/132 on 0.05 2863/129 on 0.05 0.05 on 0.05 <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>							
Depth Dept		UNITS					
Date Sampled 19/08/2012 1					2863/Dup4		
Type of sample	·				-		
Date prepared - 27/09/2012 27/09/2	·						
Date analysed - 27/09/2012 27/09/201	Type of sample		Soil	Soil	Soil	Soil	Soil
Moisture	Date prepared	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Moisture UNITS 79298-6 79298-7 79298-8 79298-9 79298-9 79298-11 Your Reference 2863/130 2863/134 2863/133 2863/13 2863/13 2863/13 2863/13 2863/13 2863/13 2863/13 2863/13 2863/13 2863/13 2863/13 2863/13 2863/13 2863/13 2863/13 2863/13 2863/13 2863/11 0.05	Date analysed	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Our Reference: UNITS 7928-6 7928-7 79298-8 7928-9 7928-9 7928-9 7928-9 7928-9 7928-9 7928-9 7928-9 7928-9 7928-9 7928-11 Your Reference 2863/130 2863/134 2863/133 2863/133 2863/131 2863/131 2863/134 2863/132 2863/131 2863/134 2863/134 2863/134 2863/132 2863/134 <td>Moisture</td> <td>%</td> <td>18</td> <td>7.7</td> <td>7.8</td> <td>7.0</td> <td>9.5</td>	Moisture	%	18	7.7	7.8	7.0	9.5
Our Reference: UNITS 7928-6 7928-7 79298-8 7928-9 7928-9 7928-9 7928-9 7928-9 7928-9 7928-9 7928-9 7928-9 7928-9 7928-11 Your Reference 2863/130 2863/134 2863/133 2863/133 2863/131 2863/131 2863/134 2863/132 2863/131 2863/134 2863/134 2863/134 2863/132 2863/134 <td></td> <td>T</td> <td>T</td> <td>T</td> <td>T</td> <td>T</td> <td></td>		T	T	T	T	T	
Your Reference Depth 2863/130 2863/134 2863/133 2863/118 2863/117 Depth 0.06 - 0.06 - 0.06 0.06 0.03 Date Sampled 1909/2012 1909/2012 1909/2012 1909/2012 1909/2012 1909/2012 2909/2012 2709/2012 290/2012							
Depth		UNITS					
Date Sample				2863/134			
Type of sample	1			-			
Date prepared - 27/09/2012 2863/16 2863/103 Depth	•						
Date analysed -	Type of sample		Soil	Soil	Soil	Soil	Soil
Moisture % 13 7.1 17 11 9.1 Moisture Our Reference: UNITS 79298-12 79298-13 79298-14 79298-15 79298-16 Your Reference: 2663/117 2863/SS119 2863/SS122 2863/116 2863/103 Depth 1.0 - - 0.15 0.25 Date Sample 19/09/2012 19/09/2012 19/09/2012 19/09/2012 19/09/2012 19/09/2012 19/09/2012 19/09/2012 27/09/2	Date prepared	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Moisture UNITS 79298-12 2863/117 2863/SS119 2863/SS122 2863/116 2863/103 0.15 0.25 Pour Reference ————————————————————————————————————	Date analysed	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Our Reference: UNITS 79298-12 2863/117 2863/SS119 2863/SS122 2863/116 2863/103 0.25 79298-16 2863/I16 2863/I1	Moisture	%	13	7.1	17	11	9.1
Our Reference: UNITS 79298-12 2863/117 2863/SS119 2863/SS122 2863/116 2863/103 0.25 79298-16 2863/I16 2863/I1		T	1	1	Т	T	T
Your Reference Depth 2863/117 2863/SS119 2863/SS122 2863/116 2863/103 0.25 Date Sampled Type of sample 19/09/2012 19/09/2012 19/09/2012 19/09/2012 19/09/2012 19/09/2012 19/09/2012 19/09/2012 19/09/2012 19/09/2012 19/09/2012 19/09/2012 27/09/2012 2863/103 2863/103 2863/125 2863/103 2863/103 2863/103 2863/103 2863/103 2863/103 2863/103 2863/103 2863/103 2863/103 2863/103 2863/103 2863/103 2863/103 2863/103 2863/103 2863/103 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>							
Depth		UNITS					
Date Sampled Type of sample 19/09/2012 Soil 27/09/2012 Soil 28/09/2012 Soil <t< td=""><td></td><td></td><td></td><td>2863/SS119</td><td>2863/SS122</td><td></td><td></td></t<>				2863/SS119	2863/SS122		
Type of sample Soil 27/09/2012 27/09/2012 27/09/2012 27/09/2012 27/09/2012 27/09/2012 27/09/2012 27/09/2012 27/09/2012 27/09/2012 27/09/2012 27/09/2012 29/09/2012 3 2 9.7 24 Moisture UNITS 79298-17 79298-18 79298-19 79298-20 79298-21 79298-21 79298-21 79298-21 79298-21 79298-21 2863/101 0.05 0.3 - 0.05 <t< td=""><td>1</td><td></td><td></td><td>-</td><td>-</td><td></td><td></td></t<>	1			-	-		
Date prepared -	· ·						
Date analysed -	Type of sample		Soil	Soil	Soil	Soil	Soil
Moisture % 13 17 25 9.7 24 Moisture Our Reference: Your Reference UNITS 79298-17 2863/103 79298-18 2863/125 79298-19 2863/125 79298-20 2863/125 79298-20 2863/103 79298-21 2863/105 2863/125 2863/125 2863/Dup3 2863/101 2863/105 2863/101 2863/Dup3 2863/101 2863/Dup3 2863/101 0.05 2863/102 0.05 2863/102 0.05 2863/102 0.05 2863/102 19/09/2012 27/09/2012 19/09/2012 27/09/2012 27/09/2012 27/09/2012 27/09/2012 27/09/2012 27/09/2012 27/09/2012 27/09/2012 27/09/2012 27/09/2012 27/09/2012 27/09/2012 27/09/2012 27/09/2012 27/09/2012 19/09/2012 2863/Dup3 2863/	Date prepared	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Moisture UNITS 79298-17 79298-18 79298-19 79298-20 79298-21 Your Reference 2863/103 2863/125 2863/125 2863/125 2863/125 2863/1093 2863/101 Depth 0.4 0.05 0.3 - 0.05 Date Sampled 19/09/2012 19/09/2012 19/09/2012 19/09/2012 19/09/2012 19/09/2012 19/09/2012 19/09/2012 19/09/2012 27/09/2012 <td>Date analysed</td> <td>-</td> <td>27/09/2012</td> <td>27/09/2012</td> <td>27/09/2012</td> <td>27/09/2012</td> <td>27/09/2012</td>	Date analysed	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Our Reference: UNITS 79298-17 79298-18 79298-19 79298-20 79298-21 Your Reference	Moisture	%	13	17	25	9.7	24
Our Reference: UNITS 79298-17 79298-18 79298-19 79298-20 79298-21 Your Reference		T	T	T	T	T	T
Your Reference Depth 2863/103 2863/125 2863/125 2863/125 2863/103 2863/101 Depth 0.4 0.05 0.3 - 0.05 Date Sampled Type of sample 19/09/2012 19/09/2012 19/09/2012 19/09/2012 19/09/2012 19/09/2012 19/09/2012 19/09/2012 19/09/2012 27/09/2012 2863/107 2863/107 2863/107 2863/107 2863/107 2863/107 2863/107 2863/107 2863/107 2863/102 2863/102 2863/102 2863/102 2863/102 2863/102 2863/102 19/09/2012 19/09/2012 19/09/2012 19/09/2012 19/09/2012 19/09/2012 19/09/2012 <t< td=""><td></td><td></td><td></td><td>70000 10</td><td></td><td></td><td></td></t<>				70000 10			
Depth Date Sampled Type of sample							
Date Sampled Type of sample 19/09/2012 Soil 27/09/2012 Soil <t< td=""><td></td><td></td><td></td><td></td><td></td><td>2863/Dup3</td><td></td></t<>						2863/Dup3	
Type of sample Soil 27/09/2012 27/09/201	·					40/00/05:5	
Date prepared - 27/09/2012 27/09/							
Date analysed Moisture - 27/09/2012 27/0			2011				SOII
Moisture % 14 9.0 7.8 19 15 Moisture Our Reference: Your Reference Depth UNITS 79298-22 2863/107 79298-23 2863/121 79298-24 2863/121 79298-25 2863/102 79298-26 2863/Dup2 2863/Dup2 2863/Dup2 0.05 2863/137 0.05 2863/102 0.15 2863/Dup2 1.5 -		-		27/09/2012	27/09/2012		27/09/2012
Moisture UNITS 79298-22 79298-23 79298-24 79298-25 79298-26 Your Reference	Date analysed	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Our Reference: UNITS 79298-22 79298-23 79298-24 79298-25 79298-26 Your Reference	Moisture	%	14	9.0	7.8	19	15
Our Reference: UNITS 79298-22 79298-23 79298-24 79298-25 79298-26 Your Reference	Moioturo						
Your Reference		LINITO	70209-22	70208-22	70208-24	70208-25	70208-26
Depth Date Sampled Type of sample		UNITS					
Date Sampled Type of sample 19/09/2012 Soil 20/09/2012 Soil <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td>2003/Dup2</td></t<>							2003/Dup2
Type of sample Soil	-						10/00/2012
Date prepared - 27/09/2012 27/09/2012 27/09/2012 27/09/2012 27/09/2012 27/09/2012 Date analysed - 27/09/2012 27/09/2012 27/09/2012 27/09/2012 27/09/2012	· ·						
Date analysed - 27/09/2012 27/09/2012 27/09/2012 27/09/2012 27/09/2012							
		-					
Moisture		-					
	Moisture	%	8.5	17	5.2	28	29

	T	T	T		T	
Moisture Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS	79298-27 2863/103 1.2 19/09/2012 Soil	79298-28 2863/SS114 - 19/09/2012 Soil	79298-29 2863/105 0.2 19/09/2012 Soil	79298-31 2863/108 1.0 19/09/2012 Soil	79298-32 2863/136 0.2 19/09/2012 Soil
Date prepared	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date analysed	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Moisture	%	18	31	23	23	4.9
		Т	T		Т	
Moisture Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS	79298-33 2863/123 0.1 19/09/2012 Soil	79298-34 2863/120 0.2 19/09/2012 Soil	79298-35 2863/138 0.5 19/09/2012 Soil	79298-36 2863/116 0.05 19/09/2012 Soil	79298-37 2863/111 0.25 19/09/2012 Soil
Date prepared	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date analysed	_	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Moisture	%	15	7.5	9.7	15	9.1
Wolotare	70	10	7.0	0.1	10	0.1
Moisture Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS	79298-38 2863/112 0.5 19/09/2012 Soil	79298-39 2863/113 0.4 19/09/2012 Soil	79298-40 2863/104 0.3 19/09/2012 Soil	79298-42 2863/118 0.3 19/09/2012 Soil	79298-46 MA Blank 1 - 19/09/2012 Soil
Date prepared	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Date analysed	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
Moisture	%	28	16	18	10	19
Moisture Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS	79298-48 MA Blank 2 - 19/09/2012 Soil	79298-51 2863/126 0.25 19/09/2012 Soil	-	-	-
Date prepared	_	27/09/2012	27/09/2012			
Date prepared Date analysed	_	27/09/2012	27/09/2012			
•	0/	17				
Moisture	%	17	6.8			

Asbestos ID - soils						
Our Reference:	UNITS	79298-1	79298-2	79298-3	79298-4	79298-5
Your Reference		2863/132	2863/131	2863/Dup4	2863/129	2863/128
Depth		0.05	0.05	- -	0.05	0.05
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	02/10/2012	02/10/2012	02/10/2012	02/10/2012	02/10/2012
Sample mass tested	g	Approx 40g				
Sample Description	-	Brown	Brown	Brown	Brown	Brown
		coarse-	coarse-	coarse-	coarse-	coarse-
		grained soil				
Asbestos ID in soil	-	No asbestos				
		detected at				
		reporting limit of 0.1g/kg				
Trace Analysis	_	No respirable				
Trace Analysis		fibres	fibres	fibres	fibres	fibres
		detected	detected	detected	detected	detected
Asbestos ID - soils						
Our Reference:	UNITS	79298-6	79298-7	79298-8	79298-16	79298-25
Your Reference		2863/130	2863/134	2863/133	2863/103	2863/102
Depth		0.05	-	0.05	0.25	1.5
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	02/10/2012	02/10/2012	02/10/2012	02/10/2012	02/10/2012
Sample mass tested	g	Approx 40g				
Sample Description	-	Brown	Brown	Brown fine-	Brown	Brown fine-
		coarse-	coarse-	grained	coarse-	grained
		grained soil	grained sandy soil	clayey soil	grained soil	clayey soil
Asbestos ID in soil	_	No asbestos				
		detected at				
		reporting limit	reporting limit	reporting limit	reportinglimit	reporting limit
		of 0.1g/kg				
Trace Analysis	-	No respirable				
		fibres	fibres	fibres	fibres	fibres
		detected	detected	detected	detected	detected

	1	I	I	I	I	
Asbestos ID - soils						
Our Reference:	UNITS	79298-26	79298-27	79298-28	79298-29	79298-31
Your Reference		2863/Dup2	2863/103	2863/SS114	2863/105	2863/108
Depth		-	1.2	-	0.2	1.0
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	02/10/2012	02/10/2012	02/10/2012	02/10/2012	02/10/2012
Sample mass tested	g	Approx 40g				
Sample Description	-	Brown fine-	Brown fine-	Brown	Brown fine-	Brown
		grained	grained	coarse-	grained soil	coarse-
		clayey soil	clayey soil	grained soil		grained
						clayey soil
Asbestos ID in soil	-	No asbestos				
		detected at				
		reporting limit of 0.1g/kg				
Trace Analysis	-	No respirable fibres				
		detected	detected	detected	detected	detected
		detected	detected	detected	detected	detected
Asbestos ID - soils						
Our Reference:	UNITS	79298-32	79298-33	79298-34	79298-35	79298-36
Your Reference		2863/136	2863/123	2863/120	2863/138	2863/116
Depth		0.2	0.1	0.2	0.5	0.05
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	02/10/2012	02/10/2012	02/10/2012	02/10/2012	02/10/2012
Sample mass tested	g	Approx 40g				
Sample Description	_	Brown	Beige coarse-	Brown fine-	Brown	Brown fine-
Campio Description		coarse-	grained soil	grained	coarse-	grained soil &
		grained soil		clayey soil	grained soil	organic
						debris
Asbestos ID in soil	-	No asbestos				
		detected at				
		reporting limit				
		of 0.1g/kg				
Trace Analysis	-	No respirable				
		fibres	fibres	fibres	fibres	fibres
		detected	detected	detected	detected	detected

Asbestos ID - soils						
Our Reference:	UNITS	79298-37	79298-38	79298-39	79298-40	79298-51
Your Reference		2863/111	2863/112	2863/113	2863/104	2863/126
Depth		0.25	0.5	0.4	0.3	0.25
Date Sampled Type of sample		19/09/2012 Soil	19/09/2012 Soil	19/09/2012 Soil	19/09/2012 Soil	19/09/2012 Soil
Date analysed	-	02/10/2012	02/10/2012	02/10/2012	02/10/2012	02/10/2012
Sample mass tested	g	Approx 40g				
Sample Description	-	Brown coarse- grained soil	Brown fine- grained clayey soil	Brown fine- grained clayey soil	Brown fine- grained clayey soil	Mustard coarse- grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg				
Trace Analysis	-	No respirable fibres detected				

Asbestos ID - materials				
Our Reference:	UNITS	79298-43	79298-44	79298-45
Your Reference		2863/ASB101	2863/ASB102	2863/ASB103
Depth		-	-	-
Date Sampled		19/09/2012	19/09/2012	19/09/2012
Type of sample		Material	Material	Material
Date analysed	-	28/09/2012	28/09/2012	28/09/2012
Mass / Dimension of Sample	-	106x82x4mm	80x69x4mm	135x55x4mm
Sample Description	-	Grey compressed fibre cement material	Grey compressed fibre cement material	Grey compressed fibre cement material
Asbestos ID in materials	-	Chrysotile asbestos detected	Chrysotile asbestos detected	Chrysotile asbestos detected

ESP/CEC					
Our Reference:	UNITS	79298-12	79298-17	79298-18	79298-42
Your Reference		2863/117	2863/103	2863/125	2863/118
Depth		1.0	0.4	0.05	0.3
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil
Exchangeable Ca	meq/100g	<0.1	5.2	0.4	<0.1
Exchangeable K	meq/100g	<0.1	0.5	0.1	<0.1
Exchangeable Mg	meq/100g	1.5	6.7	0.81	0.80
Exchangeable Na	meq/100g	<0.1	<0.1	<0.1	<0.1
Cation Exchange Capacity	meq/100g	1.7	12	1.4	<1.0
ESP	%	5.8	<1.0	6.9	6.1

Miscellaneous Inorg - soil					
Our Reference:	UNITS	79298-12	79298-17	79298-18	79298-42
Your Reference		2863/117	2863/103	2863/125	2863/118
Depth		1.0	0.4	0.05	0.3
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	28/09/2012	28/09/2012	28/09/2012	28/09/2012
Date analysed	-	28/09/2012	28/09/2012	28/09/2012	28/09/2012
pH 1:5 soil:water	pH Units	4.8	5.5	4.8	5.3
Electrical Conductivity 1:5 soil:water	μS/cm	29	51	40	18
Chloride, Cl 1:5 soil:water	mg/kg	40	49	45	28
Sulphate, SO4 1:5 soil:water	mg/kg	32	53	24	21

	1	T	T		T	
sPOCAS field test						
Our Reference:	UNITS	79298-4	79298-7	79298-8	79298-10	79298-11
Your Reference		2863/129	2863/134	2863/133	2863/117	2863/117
Depth		0.05	-	0.05	0.05	0.3
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
pHF (field pH test)*	pH Units	4.5	4.7	5.2	5.1	5.7
pHFox (field peroxide test)*	pH Units	2.0	2.7	1.9	2.6	3.7
Reaction Rate*	-	Moderate	Moderate	Moderate	Moderate	Moderate
				T		Г
sPOCAS field test						
Our Reference:	UNITS	79298-12	79298-17	79298-18	79298-28	79298-29
Your Reference		2863/117	2863/103	2863/125	2863/SS114	2863/105
Depth		1.0	0.4	0.05	-	0.2
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
pHF (field pH test)*	pH Units	5.2	5.4	4.7	6.9	5.0
pHFox (field peroxide test)*	pH Units	4.0	3.7	2.1	3.8	2.9
Reaction Rate*	-	Slight	Moderate	Slight	High	Moderate
sPOCAS field test						
Our Reference:	UNITS	79298-30	79298-33	79298-41	79298-52	79298-53
Your Reference	ONITO	2863/105	2863/123	2863/115	2863/129	2863/128
Depth		0.6	0.1	0.05	0.2	0.05
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
pHF (field pH test)*	pHUnits	4.8	5.3	4.9	5.5	5.7
pHFox (field peroxide test)*	pH Units	3.0	3.3	3.4	3.5	3.7
Reaction Rate*	-	Slight	Slight	Moderate	Moderate	Moderate

Method ID	Methodology Summary						
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS.						
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.						
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.						
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.						
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.						
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.						
Metals-020 ICP- AES	Determination of various metals by ICP-AES.						
Metals-021 CV- AAS	Determination of Mercury by Cold Vapour AAS.						
Inorg-030	Total Phenolics - determined colorimetrically following disitillation, based upon APHA 22nd ED 5530 D.						
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 4 hours.						
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.						
Metals-009	Determination of exchangeable cations and cation exchange capacity in soil based on Rayment and Lyons 2011.						
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA 22nd ED, 4500-H+.						
Inorg-002	Conductivity and Salinity - measured using a conductivity cell and dedicated meter, in accordance with APHA 22nd ED 2510 and Rayment & Lyons.						
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA 22nd ED, 4110 -B.						
Inorg-063	pH- measured using pH meter and electrode. Soil is oxidised with Hydrogen Peroxide or extracted with water. Based on section H, Acid Sulfate Soils Laboratory Methods Guidelines, Version 2.1 - June 2004. To ensure accurate results these tests are recommended to be done in the field as pH may change with time thus these results may not be representative of true field conditions.						

2863-soil and material sampling-Mura **Client Reference:** PQL QUALITYCONTROL UNITS **METHOD** Blank Duplicate **Duplicate results** Spike Sm# Spike % Sm# Recovery vTRH&BTEX in Soil Base II Duplicate II % RPD 27/09/2 79298-1 27/09/2012 | 27/09/2012 LCS-4 Date extracted 27/09/2012 012 29/09/2 Date analysed 79298-1 29/09/2012 | 29/09/2012 LCS-4 29/09/2012 012 vTRHC6 - C9 25 Org-016 <25 79298-1 <25||<25 LCS-4 114% mg/kg Benzene 0.2 Org-016 <0.2 79298-1 <0.2||<0.2 LCS-4 118% mg/kg 79298-1 LCS-4 Toluene 0.5 Org-016 < 0.5 <0.5||<0.5 114% mg/kg Ethylbenzene mg/kg 1 Org-016 79298-1 <1||<1 LCS-4 112% <1 m+p-xylene 2 Org-016 79298-1 <2||<2 LCS-4 113% mg/kg <2 LCS-4 105% o-Xylene Org-016 79298-1 mg/kg 1 <1 <1||<1 % Org-016 100 79298-1 87 || 101 || RPD: 15 LCS-4 107% Surrogate aaa-Trifluorotoluene QUALITYCONTROL **UNITS** PQL METHOD Blank Duplicate **Duplicate results** Spike Sm# Spike % Sm# Recovery sTRH in Soil (C10-C36) Base II Duplicate II % RPD Date extracted 27/09/2 79298-1 27/09/2012 | 27/09/2012 LCS-4 27/09/2012 012 27/09/2 Date analysed 79298-1 27/09/2012 | 27/09/2012 LCS-4 27/09/2012 012 TRHC₁₀ - C₁₄ mg/kg 50 Org-003 <50 79298-1 <50||<50 LCS-4 91% Org-003 79298-1 LCS-4 108% TRHC₁₅ - C₂₈ mg/kg 100 <100 110||<100 TRHC29 - C36 mg/kg 100 Org-003 <100 79298-1 140 || 100 || RPD: 33 LCS-4 92% Surrogate o-Terphenyl % Org-003 72 79298-1 89 | 85 | RPD: 5 LCS-4 93% QUALITYCONTROL UNITS PQL Blank METHOD **Duplicate Duplicate results** Spike Sm# Spike % Sm# Recovery PAHs in Soil Base II Duplicate II % RPD Date extracted 27/09/2 79298-1 27/09/2012 || 27/09/2012 LCS-4 27/09/2012 012 28/09/2 29/09/2012 | 29/09/2012 LCS-4 28/09/2012 Date analysed 79298-1 012 Naphthalene Org-012 79298-1 LCS-4 113% mg/kg 0.1 < 0.1 <0.1 || <0.1 subset Org-012 Acenaphthylene mg/kg 0.1 <0.1 79298-1 <0.1||<0.1 [NR] [NR] subset Org-012 Acenaphthene 0.1 <0.1 79298-1 <0.1||<0.1 [NR] [NR] mg/kg subset Org-012 LCS-4 117% Fluorene < 0.1 79298-1 <0.1||<0.1 mg/kg 0.1 subset Org-012 Phenanthrene mg/kg 0.1 <0.1 79298-1 <0.1||<0.1 LCS-4 100% subset Anthracene 0.1 Org-012 79298-1 [NR] [NR] mg/kg < 0.1 <0.1||<0.1 subset LCS-4 Fluoranthene Org-012 79298-1 100% mg/kg 0.1 < 0.1 <0.1||<0.1 subset Org-012 <0.1 79298-1 <0.1||<0.1 LCS-4 114% Pyrene mg/kg 0.1 subset Benzo(a)anthracene Org-012 79298-1 [NR] [NR] mg/kg 0.1 < 0.1 <0.1 || <0.1 subset LCS-4 Org-012 <0.1 79298-1 110% Chrysene mg/kg 0.1 <0.1||<0.1 subset

Client Reference: 2863-soil and material sampling-Mura										
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery		
PAHs in Soil						Base II Duplicate II %RPD				
Benzo(b+k)fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	79298-1	<0.2 <0.2	[NR]	[NR]		
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	79298-1	<0.05 <0.05	LCS-4	120%		
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	79298-1	<0.1 <0.1	[NR]	[NR]		
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	79298-1	<0.1 <0.1	[NR]	[NR]		
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	79298-1	<0.1 <0.1	[NR]	[NR]		
Surrogate p-Terphenyl- d ₁₄	%		Org-012 subset	78	79298-1	91 101 RPD: 10	LCS-4	81%		
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate	Duplicate results	Spike Sm#	Spike %		
Organochlorine Pesticides in soil					Sm#	Base II Duplicate II %RPD		Recovery		
Date extracted	-			27/9/20	79298-31	27/9/2012 27/9/2012	LCS-5	27/9/2012		
				12						
Date analysed	-			29/9/20 12	79298-31	29/9/2012 29/9/2012	LCS-5	29/9/2012		
HCB	mg/kg	0.1	Org-005	<0.1	79298-31	<0.1 <0.1	[NR]	[NR]		
alpha-BHC	mg/kg	0.1	Org-005	<0.1	79298-31	<0.1 <0.1	LCS-5	109%		
gamma-BHC	mg/kg	0.1	Org-005	<0.1	79298-31	<0.1 <0.1	[NR]	[NR]		
beta-BHC	mg/kg	0.1	Org-005	<0.1	79298-31	<0.1 <0.1	LCS-5	123%		
Heptachlor	mg/kg	0.1	Org-005	<0.1	79298-31	<0.1 <0.1	LCS-5	108%		
delta-BHC	mg/kg	0.1	Org-005	<0.1	79298-31	<0.1 <0.1	[NR]	[NR]		
Aldrin	mg/kg	0.1	Org-005	<0.1	79298-31	<0.1 <0.1	LCS-5	119%		
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	79298-31	<0.1 <0.1	LCS-5	108%		
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	79298-31	<0.1 <0.1	[NR]	[NR]		
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	79298-31	<0.1 <0.1	[NR]	[NR]		
Endosulfan I	mg/kg	0.1	Org-005	<0.1	79298-31	<0.1 <0.1	[NR]	[NR]		
pp-DDE	mg/kg	0.1	Org-005	<0.1	79298-31	<0.1 <0.1	LCS-5	109%		
Dieldrin	mg/kg	0.1	Org-005	<0.1	79298-31	<0.1 <0.1	LCS-5	111%		
Endrin	mg/kg	0.1	Org-005	<0.1	79298-31	<0.1 <0.1	LCS-5	103%		
pp-DDD	mg/kg	0.1	Org-005	<0.1	79298-31	<0.1 <0.1	LCS-5	120%		
Endosulfan II	mg/kg	0.1	Org-005	<0.1	79298-31	<0.1 <0.1	[NR]	[NR]		
pp-DDT	mg/kg	0.1	Org-005	<0.1	79298-31	<0.1 <0.1	[NR]	[NR]		
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	79298-31	<0.1 <0.1	[NR]	[NR]		
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	79298-31	<0.1 <0.1	LCS-5	97%		
Methoxychlor	mg/kg	0.1	Org-005	<0.1	79298-31	<0.1 <0.1	[NR]	[NR]		
Surrogate TCMX	%		Org-005	94	79298-31	81 83 RPD: 2	LCS-5	61%		

Client Reference: 2863-soil and material sampling-Mura QUALITYCONTROL UNITS PQL **METHOD** Blank Duplicate **Duplicate results** Spike Sm# Spike % Sm# Recovery Organophosphorus Base II Duplicate II % RPD **Pesticides** Date extracted 27/9/20 79298-31 27/9/2012 | 27/9/2012 LCS-5 27/9/2012 12 Date analysed 29/9/20 79298-31 29/9/2012 | 29/9/2012 LCS-5 29/9/2012 12 Diazinon mg/kg 0.1 Org-008 <0.1 79298-31 <0.1||<0.1 [NR] [NR] Dimethoate 0.1 Org-008 <0.1 79298-31 <0.1 || <0.1 [NR] [NR] mg/kg Org-008 Chlorpyriphos-methyl 0.1 <0.1 79298-31 <0.1 || <0.1 [NR] [NR] mg/kg Ronnel 0.1 Org-008 <0.1 79298-31 <0.1||<0.1 [NR] [NR] mg/kg Chlorpyriphos 0.1 Org-008 <0.1 79298-31 <0.1||<0.1 LCS-5 99% mg/kg LCS-5 Fenitrothion 0.1 Org-008 <0.1 79298-31 <0.1||<0.1 93% mg/kg Bromophos-ethyl 0.1 Org-008 <0.1 79298-31 <0.1||<0.1 [NR] [NR] mg/kg **Ethion** 0.1 Org-008 <0.1 79298-31 <0.1||<0.1 LCS-5 98% mg/kg LCS-5 % Org-008 94 79298-31 81 | 83 | RPD: 2 60% Surrogate TCMX QUALITYCONTROL UNITS PQL **METHOD** Blank **Duplicate Duplicate results** Spike Sm# Spike % Sm# Recovery PCBs in Soil Base II Duplicate II % RPD 27/9/20 79298-31 27/9/2012 | 27/9/2012 LCS-5 Date extracted 27/9/2012 12 29/9/20 79298-31 29/9/2012 | 29/9/2012 LCS-5 29/9/2012 Date analysed 12 Arochlor 1016 mg/kg 0.1 Org-006 <0.1 79298-31 <0.1 || <0.1 [NR] [NR] Arochlor 1221 mg/kg 0.1 Org-006 <0.1 79298-31 <0.1 || <0.1 [NR] [NR] Arochlor 1232 mg/kg 0.1 Org-006 <0.1 79298-31 <0.1||<0.1 [NR] [NR] Arochlor 1242 mg/kg 0.1 Org-006 <0.1 79298-31 <0.1||<0.1 [NR] [NR] Arochlor 1248 mg/kg 0.1 Org-006 < 0.1 79298-31 <0.1 || <0.1 [NR] [NR] Arochlor 1254 mg/kg 0.1 Org-006 <0.1 79298-31 <0.1||<0.1 LCS-5 103% Arochlor 1260 mg/kg 0.1 Org-006 <0.1 79298-31 <0.1||<0.1 [NR] [NR] % Org-006 94 79298-31 81 || 83 || RPD: 2 LCS-5 60% Surrogate TCLMX UNITS PQL Blank QUALITYCONTROL METHOD **Duplicate Duplicate results** Spike Sm# Spike % Sm# Recovery Acid Extractable metals Base II Duplicate II % RPD in soil 27/09/2 27/09/2012 | 27/09/2012 LCS-1 27/09/2012 **Date digested** 79298-1 012 27/09/2 LCS-1 Date analysed 79298-1 27/09/2012 | 27/09/2012 27/09/2012 012 Metals-020 LCS-1 Arsenic 4 79298-1 <4||5 94% mg/kg <4 **ICP-AES** Cadmium mg/kg 0.5 Metals-020 <0.5 79298-1 <0.5||<0.5 LCS-1 94% **ICP-AES** Chromium mg/kg 1 Metals-020 <1 79298-1 12||29||RPD:83 LCS-1 97% **ICP-AES** Metals-020 LCS-1 79298-1 95% Copper mg/kg 1 <1 1 || <1 **ICP-AES** Lead Metals-020 79298-1 6||9||RPD:40 LCS-1 95% mg/kg 1 <1 **ICP-AES** Metals-021 79298-1 LCS-1 101% Mercury mg/kg 0.1 < 0.1 <0.1||<0.1 CV-AAS

Client Reference: 2863-soil and material sampling-Mura PQL QUALITYCONTROL UNITS METHOD Blank Duplicate **Duplicate results** Spike Sm# Spike % Sm# Recovery Acid Extractable metals Base II Duplicate II % RPD in soil Nickel Metals-020 79298-1 2||2||RPD:0 LCS-1 95% mg/kg 1 <1 **ICP-AES** Zinc Metals-020 79298-1 5||4||RPD:22 LCS-1 98% mg/kg 1 <1 ICP-AES Metals-020 LCS-1 Magnesium mg/kg 5 <5 [NT] [NT] 93% **ICP-AES** QUALITYCONTROL **UNITS** PQL METHOD Blank Duplicate **Duplicate results** Spike % Spike Sm# Recovery Sm# Total Phenolics in Soil Base II Duplicate II % RPD 27/09/2 79298-7 27/09/2012 || 27/09/2012 LCS-1 27/09/2012 Date extracted 012 27/09/2 79298-7 27/09/2012 || 27/09/2012 LCS-1 27/09/2012 Date analysed 012 Total Phenolics (as 5 Inorg-030 79298-7 <5||<5 LCS-1 81% mg/kg <5 Phenol) QUALITYCONTROL UNITS PQL METHOD Blank Moisture Date prepared [NT] Date analysed [NT] Moisture % Inorg-008 [NT] 0.1 UNITS QUALITYCONTROL PQL METHOD Blank Asbestos ID - soils Date analysed [NT] QUALITYCONTROL UNITS PQL METHOD Blank Asbestos ID - materials Date analysed [NT] UNITS PQL QUALITYCONTROL METHOD Blank Duplicate **Duplicate results** Spike Sm# Spike % Sm# Recovery ESP/CEC Base II Duplicate II % RPD Exchangeable Ca meq/100 0.1 Metals-009 <0.1 79298-12 <0.1||<0.1 LCS-1 100% Exchangeable K meq/100 Metals-009 79298-12 LCS-1 0.1 <0.1 <0.1||<0.1 99% Exchangeable Mg Metals-009 1.5 || 1.5 || RPD: 0 LCS-1 meq/100 0.1 <0.1 79298-12 96% g Exchangeable Na meq/100 0.1 Metals-009 79298-12 LCS-1 99% <0.1 <0.1||<0.1 g Cation Exchange meq/100 Metals-009 1.7 || 1.7 || RPD: 0 [NR] [NR] 1 <1.0 79298-12 Capacity g

Metals-009

<1.0

79298-12

5.8 | | 5.6 | | RPD: 4

Envirolab Reference: 79298 Revision No: R 01

%

1

ESP

[NR]

[NR]

Client Reference: 2863-soil and material sampling-Mura PQL QUALITYCONTROL UNITS METHOD Blank Duplicate **Duplicate results** Spike Sm# Spike % Sm# Recovery Base II Duplicate II % RPD Miscellaneous Inorg - soil 28/09/2 [NT] LCS-1 28/09/2012 Date prepared [NT] 012 28/09/2 Date analysed [NT] [NT] LCS-1 28/09/2012 012 pH 1:5 soil:water pH Units Inorg-001 [NT] [NT] [NT] LCS-1 102% 106% **Electrical Conductivity** µS/cm 1 Inorg-002 [NT] [NT] LCS-1 <1 1:5 soil:water Chloride, CI 1:5 LCS-1 116% mg/kg 2 Inorg-081 <2 [NT] [NT] soil:water Sulphate, SO41:5 2 Inorg-081 <2 [NT] [NT] LCS-1 119% mg/kg soil:water QUALITYCONTROL UNITS PQL METHOD Blank sPOCAS field test pH Units Inorg-063 [NT] pHF (field pH test)* pH Units pHFox (field peroxide Inorg-063 [NT] test)3 QUALITYCONTROL **UNITS** Dup. Sm# Duplicate Spike Sm# Spike % Recovery vTRH & BTEX in Soil Base + Duplicate + %RPD Date extracted 79298-11 27/09/2012 | 27/09/2012 LCS-5 27/09/2012 79298-11 29/09/2012 | 29/09/2012 LCS-5 29/09/2012 Date analysed vTRHC6 - C9 mg/kg 79298-11 <25||<25 LCS-5 113% Benzene 79298-11 LCS-5 121% mg/kg <0.2||<0.2 Toluene 79298-11 <0.5||<0.5 LCS-5 117% mg/kg Ethylbenzene mg/kg 79298-11 <1||<1 LCS-5 107% LCS-5 109% m+p-xylene mg/kg 79298-11 <2||<2 o-Xylene LCS-5 mg/kg 79298-11 <1||<1 100% LCS-5 79298-11 109 | 102 | RPD: 7 112% % Surrogate aaa-Trifluorotoluene QUALITYCONTROL UNITS Dup. Sm# Spike Sm# Spike % Recovery **Duplicate** sTRH in Soil (C10-C36) Base + Duplicate + %RPD Date extracted 79298-11 27/09/2012 | 27/09/2012 LCS-5 27/09/2012 Date analysed 79298-11 27/09/2012 | 27/09/2012 LCS-5 27/09/2012 79298-11 <50||<50 LCS-5 88% TRHC₁₀ - C₁₄ mg/kg TRHC₁₅ - C₂₈ mg/kg 79298-11 <100 || <100 LCS-5 102% <100 || <100 TRHC29 - C36 mg/kg 79298-11 LCS-5 89% Surrogate o-Terphenyl % 79298-11 86 | 85 | RPD: 1 LCS-5 76% QUALITYCONTROL **UNITS** Dup. Sm# **Duplicate** Spike Sm# Spike % Recovery PAHs in Soil Base + Duplicate + %RPD Date extracted 79298-11 27/09/2012 | 27/09/2012 LCS-5 27/09/2012 LCS-5 29/09/2012 | 29/09/2012 28/09/2012 Date analysed 79298-11 LCS-5 Naphthalene mg/kg 79298-11 <0.1||<0.1 105% Acenaphthylene 79298-11 <0.1||<0.1 [NR] [NR] mg/kg

Envirolab Reference: 79298 Revision No: R 01

mg/kg

mg/kg

79298-11

79298-11

<0.1||<0.1

<0.1||<0.1

[NR]

LCS-5

Acenaphthene

Fluorene

[NR]

108%

	Client Reference: 2863-soil and mat				naterial sampling-Mura			
QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base+Duplicate+%RPD	Spike Sm#	Spike % Recovery			
Phenanthrene	mg/kg	79298-11	<0.1 <0.1	LCS-5	91%			
Anthracene	mg/kg	79298-11	<0.1 <0.1	[NR]	[NR]			
Fluoranthene	mg/kg	79298-11	<0.1 <0.1	LCS-5	92%			
		79298-11		LCS-5	104%			
Pyrene	mg/kg		<0.1 <0.1					
Benzo(a)anthracene	mg/kg	79298-11	<0.1 <0.1	[NR]	[NR]			
Chrysene	mg/kg	79298-11	<0.1 <0.1	LCS-5	100%			
Benzo(b+k)fluoranthene	mg/kg	79298-11	<0.2 <0.2	[NR]	[NR]			
Benzo(a)pyrene	mg/kg	79298-11	<0.05 <0.05	LCS-5	115%			
Indeno(1,2,3-c,d)pyrene	mg/kg	79298-11	<0.1 <0.1	[NR]	[NR]			
Dibenzo(a,h)anthracene	mg/kg	79298-11	<0.1 <0.1	[NR]	[NR]			
Benzo(g,h,i)perylene	mg/kg	79298-11	<0.1 <0.1	[NR]	[NR]			
Surrogate p-Terphenyl- d ₁₄	%	79298-11	93 93 RPD:0	LCS-5	60%			
QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery			
Date extracted	-	[NT]	[NT]	79298-32	27/9/2012			
Date analysed	-	[NT]	[NT]	79298-32	29/9/2012			
HCB	mg/kg	[NT]	[NT]	[NR]	[NR]			
alpha-BHC	mg/kg	[NT]	[NT]	79298-32	110%			
gamma-BHC	mg/kg	[NT]	[NT]	[NR]	[NR]			
beta-BHC	mg/kg	[NT]	[NT]	79298-32	78%			
Heptachlor	mg/kg	[NT]	[NT]	79298-32	97%			
delta-BHC	mg/kg	[NT]	[NT]	[NR]	[NR]			
Aldrin	mg/kg	[NT]	[NT]	79298-32	119%			
Heptachlor Epoxide	mg/kg	[NT]	[NT]	79298-32	108%			
gamma-Chlordane	mg/kg	[NT]	[NT]	[NR]	[NR]			
alpha-chlordane	mg/kg	[NT]	[NT]	[NR]	[NR]			
Endosulfan I	mg/kg	[NT]	[NT]	[NR]	[NR]			
pp-DDE	mg/kg	[NT]	[NT]	79298-32	107%			
Dieldrin	mg/kg	[NT]	[NT]	79298-32	68%			
Endrin	mg/kg	[NT]	[NT]	79298-32	98%			
pp-DDD	mg/kg	[NT]	[NT]	79298-32	102%			
Endosulfan II	mg/kg	[NT]	. <i>,</i> [NT]	[NR]	[NR]			
pp-DDT	mg/kg	[NT]	. <i>,</i> [NT]	[NR]	[NR]			
Endrin Aldehyde	mg/kg	[NT]	[NT]	[NR]	[NR]			
Endosulfan Sulphate	mg/kg	[NT]	[NT]	79298-32	95%			
Methoxychlor	mg/kg	[NT]	[NT]	[NR]	[NR]			
Surrogate TCMX	%	[NT]	[NT]	79298-32	87%			

	Client Reference: 2863-soil and mat				nd material sampling-Mura			
QUALITYCONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery			
Date extracted	-	[NT]	[NT]	79298-32	27/9/2012			
Date analysed	_	[NT]	[NT]	79298-32	29/9/2012			
Diazinon	mg/kg	[NT]	[NT]	[NR]	[NR]			
Dimethoate	mg/kg	[NT]	[NT]	[NR]	[NR]			
Chlorpyriphos-methyl	mg/kg	[NT]	[NT]	[NR]	[NR]			
Ronnel	mg/kg	[NT]	[NT]	[NR]	[NR]			
Chlorpyriphos	mg/kg	[NT]	[NT]	79298-32	106%			
Fenitrothion	mg/kg	[NT]	[NT]	79298-32	95%			
Bromophos-ethyl	mg/kg	[NT]	[NT]	[NR]	[NR]			
Ethion	mg/kg	[NT]	[NT]	79298-32	106%			
Surrogate TCMX	%	[NT]	[NT]	79298-32	94%			
QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery			
Date extracted	-	[NT]	[NT]	79298-32	27/9/2012			
Date analysed	_	[NT]	[NT]	79298-32	29/9/2012			
Arochlor 1016	mg/kg	[NT]	[NT]	[NR]	[NR]			
Arochlor 1221	mg/kg	[NT]	[NT]	[NR]	[NR]			
Arochlor 1232	mg/kg	[NT]	[NT]	[NR]	[NR]			
Arochlor 1242	mg/kg	[NT]	[NT]	[NR]	[NR]			
Arochlor 1248	mg/kg	[NT]	[NT]	[NR]	[NR]			
Arochlor 1254	mg/kg	[NT]	[NT]	79298-32	102%			
Arochlor 1260	mg/kg	[NT]	[NT]	[NR]	[NR]			
Surrogate TCLMX	%	[NT]	[NT]	79298-32	93%			
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup.Sm#	Duplicate Base+Duplicate+%RPD	Spike Sm#	Spike % Recovery			
Date digested	-	79298-11	27/09/2012 27/09/2012	LCS-2	27/09/2012			
Date analysed	-	79298-11	27/09/2012 27/09/2012	LCS-2	27/09/2012			
Arsenic	mg/kg	79298-11	<4 <4	LCS-2	94%			
Cadmium	mg/kg	79298-11	<0.5 <0.5	LCS-2	95%			
Chromium	mg/kg	79298-11	16 19 RPD:17	LCS-2	97%			
Copper	mg/kg	79298-11	<1 <1	LCS-2	96%			
Lead	mg/kg	79298-11	4 4 RPD:0	LCS-2	95%			
Mercury	mg/kg	79298-11	<0.1 <0.1	LCS-2	99%			
Nickel	mg/kg	79298-11	2 2 RPD:0	LCS-2	95%			
Zinc	mg/kg	79298-11	2 2 RPD:0	LCS-2	95%			
Magnesium	mg/kg	[NT]	[NT]	LCS-2	94%			

		Client Reference	e: 2863-soil and mat	eriai sampiing-wit	ıra
QUALITY CONTROL Total Phenolics in Soil	UNITS	Dup. Sm#	Duplicate Base+Duplicate+%RPD	Spike Sm#	Spike % Recovery
Date extracted	-	79298-33	27/09/2012 27/09/2012	79298-8	27/09/2012
Date analysed	-	79298-33	27/09/2012 27/09/2012	79298-8	27/09/2012
Total Phenolics (as Phenol)	mg/kg	79298-33	 <5 <5	79298-8	8%
QUALITYCONTROL	UNITS	Dup. Sm#	Duplicate	Spike Sm#	Spike % Recovery
Miscellaneous Inorg - soil		·	Base + Duplicate + %RPD		
Date prepared	-	[NT]	[NT]	79298-2	28/09/2012
Date analysed	-	[NT]	[NT]	79298-2	28/09/2012
pH 1:5 soil:water	pH Units	[NT]	[NT]	79298-2	102%
Electrical Conductivity 1:5 soil:water	μS/cm	[NT]	[NT]	79298-2	106%
Chloride, Cl 1:5 soil:water	mg/kg	[NT]	[NT]	79298-2	116%
Sulphate, SO41:5 soil:water	mg/kg	[NT]	[NT]	79298-2	119%
QUALITY CONTROL vTRH & BTEX in Soil	UNITS	Dup. Sm#	Duplicate Base+Duplicate+%RPD	Spike Sm#	Spike % Recovery
Date extracted	-	79298-21	27/09/2012 27/09/2012	79298-2	27/09/2012
Date analysed	-	79298-21	29/09/2012 29/09/2012	79298-2	28/09/2012
vTRHC6 - C9	mg/kg	79298-21	<25 <25	79298-2	98%
Benzene	mg/kg	79298-21	<0.2 <0.2	79298-2	103%
Toluene	mg/kg	79298-21	<0.5 <0.5	79298-2	99%
Ethylbenzene	mg/kg	79298-21	<1 <1	79298-2	95%
m+p-xylene	mg/kg	79298-21	<2 <2	79298-2	96%
o-Xylene	mg/kg	79298-21	<1 <1	79298-2	89%
Surrogate aaa- Trifluorotoluene	%	79298-21	99 102 RPD:3	79298-2	99%
QUALITYCONTROL	UNITS	Dup. Sm#	Duplicate	Spike Sm#	Spike % Recovery
sTRH in Soil (C10-C36)			Base + Duplicate + %RPD		
Date extracted	-	79298-21	27/09/2012 27/09/2012	79298-2	27/09/2012
Date analysed	-	79298-21	27/09/2012 27/09/2012	79298-2	27/09/2012
TRHC10 - C14	mg/kg	79298-21	<50 <50	79298-2	94%
TRHC15 - C28	mg/kg	79298-21	<100 <100	79298-2	119%
TRHC29 - C36	mg/kg	79298-21	<100 <100	79298-2	111%
Surrogate o-Terphenyl	%	79298-21	83 84 RPD: 1	79298-2	102%
QUALITYCONTROL	UNITS	Dup. Sm#	Duplicate	Spike Sm#	Spike % Recovery
PAHs in Soil			Base + Duplicate + %RPD		
Date extracted	-	79298-21	27/09/2012 27/09/2012	79298-2	27/09/2012
Date analysed	-	79298-21	29/09/2012 29/09/2012	79298-2	29/09/2012
Naphthalene	mg/kg	79298-21	<0.1 <0.1	79298-2	102%
Acenaphthylene	mg/kg	79298-21	<0.1 <0.1	[NR]	[NR]
Acenaphthene	mg/kg	79298-21	<0.1 <0.1	[NR]	[NR]
Fluorene	mg/kg	79298-21	<0.1 <0.1	79298-2	114%
Phenanthrene	mg/kg	79298-21	0.1 0.1 RPD: 0	79298-2	92%

	Client Reference: 2863-soil and mate				terial sampling-Mura		
QUALITYCONTROL	UNITS	Dup. Sm#	Duplicate	Spike Sm#	Spike % Recovery		
PAHs in Soil			Base + Duplicate + %RPD				
Anthracene	mg/kg	79298-21	<0.1 <0.1	[NR]	[NR]		
Fluoranthene	mg/kg	79298-21	0.4 0.3 RPD:29	79298-2	93%		
Pyrene	mg/kg	79298-21	0.4 0.3 RPD:29	79298-2	105%		
Benzo(a)anthracene	mg/kg	79298-21	0.2 0.1 RPD:67	[NR]	[NR]		
Chrysene	mg/kg	79298-21	0.2 0.2 RPD:0	79298-2	100%		
Benzo(b+k)fluoranthene	mg/kg	79298-21	0.3 0.3 RPD:0	[NR]	[NR]		
Benzo(a)pyrene	mg/kg	79298-21	0.27 0.22 RPD: 20	79298-2	120%		
Indeno(1,2,3-c,d)pyrene	mg/kg	79298-21	0.1 0.1 RPD: 0	[NR]	[NR]		
Dibenzo(a,h)anthracene	mg/kg	79298-21	<0.1 <0.1	[NR]	[NR]		
Benzo(g,h,i)perylene	mg/kg	79298-21	0.1 0.1 RPD: 0	[NR]	[NR]		
Surrogate p-Terphenyl- d ₁₄	%	79298-21	93 105 RPD:12	79298-2	99%		
QUALITYCONTROL	UNITS	Dup. Sm#	Duplicate	Spike Sm#	Spike % Recovery		
Acid Extractable metals in soil			Base + Duplicate + %RPD				
Date digested	-	79298-21	27/09/2012 27/09/2012	LCS-3	27/09/2012		
Date analysed	-	79298-21	27/09/2012 27/09/2012	LCS-3	27/09/2012		
Arsenic	mg/kg	79298-21	8 8 RPD:0	LCS-3	101%		
Cadmium	mg/kg	79298-21	<0.5 <0.5	LCS-3	99%		
Chromium	mg/kg	79298-21	24 23 RPD:4	LCS-3	104%		
Copper	mg/kg	79298-21	11 11 RPD: 0	LCS-3	101%		
Lead	mg/kg	79298-21	48 47 RPD:2	LCS-3	101%		
Mercury	mg/kg	79298-21	<0.1 <0.1	LCS-3	104%		
Nickel	mg/kg	79298-21	5 5 RPD:0	LCS-3	101%		
Zinc	mg/kg	79298-21	47 43 RPD:9	LCS-3	102%		
Magnesium	mg/kg	[NT]	[NT]	LCS-3	101%		
QUALITYCONTROL vTRH&BTEX in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery		
Date extracted	-	79298-31	27/09/2012 27/09/2012	79298-32	27/09/2012		
Date analysed	-	79298-31	29/09/2012 29/09/2012	79298-32	29/09/2012		
vTRHC6 - C9	mg/kg	79298-31	 <25 <25	79298-32	85%		
Benzene	mg/kg	79298-31	<0.2 <0.2	79298-32	92%		
Toluene	mg/kg	79298-31	<0.5 <0.5	79298-32	88%		
Ethylbenzene	mg/kg	79298-31	~1 <1	79298-32	81%		
m+p-xylene	mg/kg	79298-31	<2 <2	79298-32	83%		
o-Xylene	mg/kg	79298-31	~1 <1	79298-32	76%		
Surrogate aaa- Trifluorotoluene	%	79298-31	107 111 RPD:4	79298-32	86%		

		Client Reference	erial sampling-Mu	ıra	
QUALITYCONTROL	UNITS	Dup. Sm#	Duplicate	Spike Sm#	Spike % Recovery
sTRH in Soil (C10-C36)			Base + Duplicate + %RPD		
Date extracted	-	79298-31	27/09/2012 27/09/2012	79298-32	27/09/2012
Date analysed	-	79298-31	27/09/2012 27/09/2012	79298-32	27/09/2012
TRHC10 - C14	mg/kg	79298-31	<50 <50	79298-32	88%
TRHC 15 - C28	mg/kg	79298-31	<100 <100	79298-32	106%
TRHC29 - C36	mg/kg	79298-31	<100 <100	79298-32	93%
Surrogate o-Terphenyl	%	79298-31	66 72 RPD:9	79298-32	114%
QUALITYCONTROL	UNITS	Dup.Sm#	Duplicate	Spike Sm#	Spike % Recovery
PAHs in Soil			Base + Duplicate + %RPD		
Date extracted	-	79298-31	27/09/2012 27/09/2012	79298-32	27/09/2012
Date analysed	-	79298-31	29/09/2012 29/09/2012	79298-32	29/09/2012
Naphthalene	mg/kg	79298-31	<0.1 <0.1	79298-32	103%
Acenaphthylene	mg/kg	79298-31	0.1 0.1 RPD: 0	[NR]	[NR]
Acenaphthene	mg/kg	79298-31	<0.1 <0.1	[NR]	[NR]
Fluorene	mg/kg	79298-31	<0.1 <0.1	79298-32	106%
Phenanthrene	mg/kg	79298-31	<0.1 0.1	79298-32	90%
Anthracene	mg/kg	79298-31	<0.1 <0.1	[NR]	[NR]
Fluoranthene	mg/kg	79298-31	0.2 0.2 RPD:0	79298-32	90%
Pyrene	mg/kg	79298-31	0.2 0.2 RPD:0	79298-32	102%
Benzo(a)anthracene	mg/kg	79298-31	0.1 0.2 RPD: 67	[NR]	[NR]
Chrysene	mg/kg	79298-31	0.2 0.2 RPD:0	79298-32	98%
Benzo(b+k)fluoranthene	mg/kg	79298-31	0.4 0.4 RPD:0	[NR]	[NR]
Benzo(a)pyrene	mg/kg	79298-31	0.37 0.41 RPD: 10	79298-32	110%
Indeno(1,2,3-c,d)pyrene	mg/kg	79298-31	0.2 0.2 RPD:0	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	79298-31	<0.1 <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	79298-31	0.2 0.2 RPD:0	[NR]	[NR]
Surrogate p-Terphenyl- d ₁₄	%	79298-31	73 83 RPD:13	79298-32	82%

		Client Reference	e: 2863-soil and mate	erial sampling-Mura		
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery	
Date digested	-	79298-31	27/09/2012 27/09/2012	79298-2	27/09/2012	
Date analysed	-	79298-31	27/09/2012 27/09/2012	79298-2	27/09/2012	
Arsenic	mg/kg	79298-31	8 10 RPD:22	79298-2	99%	
Cadmium	mg/kg	79298-31	<0.5 <0.5	79298-2	97%	
Chromium	mg/kg	79298-31	19 29 RPD:42	79298-2	108%	
Copper	mg/kg	79298-31	22 22 RPD:0	79298-2	104%	
Lead	mg/kg	79298-31	21 24 RPD: 13	79298-2	99%	
Mercury	mg/kg	79298-31	<0.1 <0.1	79298-2	95%	
Nickel	mg/kg	79298-31	4 4 RPD:0	79298-2	100%	
Zinc	mg/kg	79298-31	26 24 RPD:8	79298-2	99%	
Magnesium	mg/kg	[NT]	[NT]	[NR]	[NR]	
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery	
Date digested	-	[NT]	[NT]	79298-32	27/09/2012	
Date analysed	-	[NT]	[NT]	79298-32	27/09/2012	
Arsenic	mg/kg	[NT]	[NT]	79298-32	101%	
Cadmium	mg/kg	[NT]	[NT]	79298-32	99%	
Chromium	mg/kg	[NT]	[NT]	79298-32	104%	
Copper	mg/kg	[NT]	[NT]	79298-32	101%	
Lead	mg/kg	[NT]	[NT]	79298-32	101%	
Mercury	mg/kg	[NT]	[NT]	79298-32	104%	
Nickel	mg/kg	[NT]	[NT]	79298-32	101%	
Zinc	mg/kg	[NT]	[NT]	79298-32	102%	
Magnesium	mg/kg	[NT]	[NT]	79298-32	101%	

Report Comments:

Asbestos in Soil: A portion of the supplied sample was sub-sampled for asbestos analysis according to Envirolab procedures. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g of sample in its own container.

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteriae has been exceeded for 79298-1 for Cr. Therefore a triplicate result has been issued as laboratory sample number 79298-54.

Asbestos ID was analysed by Approved Identifier: Kim Femia, Paul Ching

Asbestos ID was authorised by Approved Signatory: Paul Ching

INS: Insufficient sample for this test PQL: Practical Quantitation Limit NT: Not tested NA: Test not required RPD: Relative Percent Difference NA: Test not required

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike: A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample): This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

Envirolab Reference: 79298 Page 45 of 45

Revision No: R 01



Envirolab Services Pty Ltd

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CERTIFICATE OF ANALYSIS 79298-B

Client:

Martens & Associates Pty Ltd

6/37 Leighton Place Hornsby NSW 2077

Attention: Ben McGiffin

Sample log in details:

Your Reference: 2863-soil and material sampling-Mura

No. of samples: Additional Testing on 15 Soils

Date samples received / completed instructions received 24/09/2012, 25/09/1211/10/12

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date: 19/10/12 / 19/10/12

Date of Preliminary Report: Not issued

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Results Approved By:

M. Mausfjelf Matt Mansfield Approved Signatory



sPOCAS						
SPOCAS Our Reference: Your Reference Depth Date Sampled	UNITS	79298-B-4 2863/129 0.05 19/09/2012	79298-B-7 2863/134 - 19/09/2012	79298-B-8 2863/133 0.05 19/09/2012	79298-B-10 2863/117 0.05 19/09/2012	79298-B-11 2863/117 0.3 19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/10/2012	15/10/2012	15/10/2012	15/10/2012	15/10/2012
Date analysed	-	15/10/2012	15/10/2012	15/10/2012	15/10/2012	15/10/2012
pH kd	pH units	3.8	3.8	4.1	4.3	4.5
TAA pH 6.5	moles H+/t	37	37	42	42	20
s-TAA pH 6.5	%w/w S	0.06	0.06	0.07	0.07	0.03
pH o _x	pH units	2.5	3.0	2.5	2.7	3.8
TPA pH 6.5	moles H+/t	260	120	300	180	12
s-TPA pH 6.5	%w/w S	0.42	0.20	0.48	0.29	0.02
TSA pH 6.5	moles H+/t	220	87	260	140	<5
s-TSA pH 6.5	%w/w S	0.36	0.14	0.41	0.22	<0.01
ANCE	%CaCO₃	<0.05	<0.05	<0.05	<0.05	<0.05
a-ANCE	moles H+/t	<5	<5	<5	<5	<5
s-ANCe	%w/w S	<0.05	<0.05	<0.05	<0.05	<0.05
Skci	%w/w S	<0.005	<0.005	<0.005	<0.005	<0.005
SP	%w/w	0.01	0.009	0.03	0.02	0.01
Spos	%w/w	0.009	0.007	0.03	0.02	0.01
a-Spos	moles H+/t	6	<5	17	12	7
Саксі	%w/w	0.01	0.01	0.01	0.02	<0.005
Сар	%w/w	0.01	0.01	0.02	0.02	<0.005
Сал	%w/w	<0.005	<0.005	0.005	<0.005	<0.005
М дксі	%w/w	<0.005	0.008	0.010	0.012	0.012
МgР	%w/w	<0.005	0.008	0.013	0.015	0.014
MgA	%w/w	<0.005	<0.005	<0.005	<0.005	<0.005
Shci	%w/w S	<0.005	<0.005	0.006	<0.005	[NT]
SNAS	%w/w S	<0.005	<0.005	<0.005	<0.005	[NT]
a-Snas	moles H ⁺ /t	<5	<5	<5	<5	[NT]
s-Snas	%w/w S	<0.01	<0.01	<0.01	<0.01	[NT]
Fineness Factor	-	1.5	1.5	1.5	1.5	1.5
a-Net Acidity	moles H ⁺ /t	44	43	61	56	27
Limingrate	kg CaCO3/t	3.3	3.2	4.6	4.2	2.0
a-Net Acidity without ANCE	moles H+/t	NA	NA	NA	NA	NA
Liming rate without ANCE	kg CaCO3/t	NA	NA	NA	NA	NA

sPOCAS						
Our Reference:	UNITS	79298-B-12	79298-B-17	79298-B-18	79298-B-28	79298-B-29
Your Reference		2863/117	2863/103	2863/125	2863/SS114	2863/105
Depth		1.0	0.4	0.05	-	0.2
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/10/2012	15/10/2012	15/10/2012	15/10/2012	15/10/2012
Date analysed	-	15/10/2012	15/10/2012	15/10/2012	15/10/2012	15/10/2012
pH ка	pH units	4.2	4.3	4.4	6.7	4.2
TAA pH 6.5	moles H ⁺ /t	45	32	35	<5	55
s-TAA pH 6.5	%w/w S	0.07	0.05	0.06	<0.01	0.09
pH ox	pH units	3.9	3.6	3.0	3.6	3.7
TPApH6.5	moles H ⁺ /t	47	32	100	<5	140
s-TPA pH 6.5	%w/w S	0.08	0.05	0.16	<0.01	0.23
TSA pH 6.5	moles H ⁺ /t	<5	<5	65	<5	87
s-TSA pH 6.5	%w/w S	<0.01	<0.01	0.10	<0.01	0.14
ANCE	%CaCO₃	<0.05	<0.05	<0.05	<0.05	<0.05
a-ANCE	moles H ⁺ /t	<5	<5	<5	<5	<5
s-ANCe	%w/w S	<0.05	<0.05	<0.05	<0.05	<0.05
Skci	%w/w S	0.03	<0.005	<0.005	<0.005	0.02
Sp	%w/w	0.07	0.03	0.01	0.04	0.08
Spos	%w/w	0.04	0.03	0.01	0.04	0.06
a-Spos	moles H ⁺ /t	25	20	6	24	40
Саксі	%w/w	<0.005	0.14	<0.005	0.06	0.04
Сар	%w/w	0.01	0.15	0.005	0.08	0.05
Сад	%w/w	0.014	0.019	<0.005	0.018	0.008
Mg kcı	%w/w	0.017	0.098	<0.005	0.016	0.012
MgP	%w/w	0.027	0.11	0.006	0.024	0.015
MgA	%w/w	0.009	0.013	<0.005	0.008	<0.005
Shci	%w/w S	0.025	0.013	<0.005	[NT]	0.027
Snas	%w/w S	<0.005	0.010	<0.005	[NT]	0.011
a-Snas	moles H ⁺ /t	<5	<5	<5	[NT]	5
s-Snas	%w/w S	<0.01	<0.01	<0.01	[NT]	<0.01
Fineness Factor	-	1.5	1.5	1.5	1.5	1.5
a-Net Acidity	moles H ⁺ /t	70	57	43	24	100
Liming rate	kg CaCO3/t	5.2	4.3	3.2	1.8	7.5
a-Net Acidity without ANCE	moles H ⁺ /t	NA	NA	NA	NA	NA
Liming rate without ANCE	kg CaCO3/t	NA	NA	NA	NA	NA

sPOCAS						
Our Reference:	UNITS	79298-B-30	79298-B-33	79298-B-41	79298-B-52	79298-B-53
Your Reference		2863/105	2863/123	2863/115	2863/129	2863/128
Depth		0.6	0.1	0.05	0.2	0.05
Date Sampled		19/09/2012	19/09/2012	19/09/2012	19/09/2012	19/09/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/10/2012	15/10/2012	15/10/2012	15/10/2012	15/10/2012
Date analysed	-	15/10/2012	15/10/2012	15/10/2012	15/10/2012	15/10/2012
pH ка	pH units	3.9	4.3	4.3	4.8	4.6
TAA pH 6.5	moles H+/t	62	25	25	12	17
s-TAA pH 6.5	%w/w S	0.10	0.04	0.04	0.02	0.03
pH ox	pH units	3.6	4.0	3.3	3.6	3.7
TPApH6.5	moles H+/t	55	12	32	<5	7
s-TPA pH 6.5	%w/w S	0.09	0.02	0.05	<0.01	0.01
TSA pH 6.5	moles H ⁺ /t	<5	<5	7	<5	<5
s-TSA pH 6.5	%w/w S	<0.01	<0.01	0.01	<0.01	<0.01
ANCE	%CaCO₃	<0.05	<0.05	<0.05	<0.05	<0.05
a-ANCE	moles H ⁺ /t	<5	<5	<5	<5	<5
s-ANCE	%w/w S	<0.05	<0.05	<0.05	<0.05	<0.05
Skci	%w/w S	0.009	<0.005	0.005	<0.005	<0.005
Sp	%w/w	0.01	<0.005	0.02	0.007	0.008
Spos	%w/w	0.006	<0.005	0.02	0.007	0.006
a-Spos	moles H+/t	<5	<5	11	<5	<5
Саксі	%w/w	<0.005	0.01	0.01	<0.005	<0.005
Сар	%w/w	0.006	0.01	0.02	<0.005	<0.005
Сад	%w/w	<0.005	<0.005	0.005	<0.005	<0.005
Mg kcı	%w/w	0.005	0.006	0.013	<0.005	0.008
МgР	%w/w	0.006	0.006	0.014	<0.005	0.009
MgA	%w/w	<0.005	<0.005	<0.005	<0.005	<0.005
Shci	%w/w S	0.007	<0.005	0.009	<0.005	<0.005
SNAS	%w/w S	<0.005	<0.005	<0.005	<0.005	<0.005
a-Snas	moles H ⁺ /t	<5	<5	<5	<5	<5
s-Snas	%w/w S	<0.01	<0.01	<0.01	<0.01	<0.01
Fineness Factor	-	1.5	1.5	1.5	1.5	1.5
a-Net Acidity	moles H ⁺ /t	66	27	37	17	21
Liming rate	kg CaCO3/t	5.0	2.0	2.8	1.2	1.6
a-Net Acidity without ANCE	moles H ⁺ /t	NA	NA	NA	NA	NA
Liming rate without ANCE	kg CaCO3/t	NA	NA	NA	NA	NA

Method ID	Methodology Summary
"	sPOCAS determined using titrimetric and ICP-AES techniques. Based on Acid Sulfate Soils Laboratory Methods Guidelines, Version 2.1 - June 2004.

Envirolab Reference: 79298-B Page 5 of 9

Revision No: R 00

Client Reference: 2863-soil and material sampling-Mura PQL Blank QUALITYCONTROL UNITS METHOD Duplicate Duplicate results Spike Sm# Spike % Sm# Recovery sPOCAS Base II Duplicate II % RPD Date prepared 15/10/2 79298-B-4 15/10/2012 || 15/10/2012 LCS-1 15/10/2012 012 Date analysed 15/10/2 79298-B-4 15/10/2012 || 15/10/2012 LCS-1 15/10/2012 012 Inorg-064 [NT] 79298-B-4 3.8 | 3.8 | RPD: 0 LCS-1 98% pH kd pH units TAA pH 6.5 moles 5 Inorg-064 79298-B-4 37 | 25 | RPD: 39 LCS-1 97% <5 H⁺/t s-TAA pH 6.5 %w/w 0.01 Inorg-064 < 0.01 79298-B-4 0.06 || 0.04 || RPD: 40 [NR] [NR] Inorg-064 [NT] 79298-B-4 pH ox pH units 2.5 || 2.5 || RPD: 0 LCS-1 104% TPApH6.5 moles Inorg-064 79298-B-4 260 || 260 || RPD: 0 LCS-1 96% 5 <5 H⁺/t %w/w 0.01 < 0.01 79298-B-4 0.42 || 0.41 || RPD: 2 [NR] s-TPA pH 6.5 Inorg-064 [NR] S TSA pH 6.5 moles 5 Inorg-064 <5 79298-B-4 220 | 230 | RPD: 4 LCS-1 96% H⁺/t 0.36 | 0.37 | RPD: 3 s-TSA pH 6.5 %w/w 0.01 Inorg-064 < 0.01 79298-B-4 [NR] [NR] S 0.05 < 0.05 79298-B-4 <0.05||<0.05 [NR] % Inorg-064 [NR] **ANCE** CaCO₃ a-ANC_E moles 5 Inorg-064 <5 79298-B-4 <5||<5 [NR] [NR] H⁺/t %w/w 0.05 Inorg-064 < 0.05 79298-B-4 <0.05||<0.05 [NR] [NR] s-ANC_E S 0.005 <0.005 || <0.005 %w/w Inorg-064 < 0.005 79298-B-4 LCS-1 97% Skci S SP %w/w 0.005 Inorg-064 < 0.005 79298-B-4 0.01 || 0.01 || RPD: 0 LCS-1 112% %w/w 0.005 Inorg-064 < 0.005 79298-B-4 0.009 | 0.01 | RPD: 11 LCS-1 118% Spos moles 5 Inorg-064 <5 79298-B-4 6||7||RPD:15 LCS-1 118% a-Spos H⁺/t %w/w 0.005 Inorg-064 < 0.005 79298-B-4 0.01 || 0.01 || RPD: 0 LCS-1 98% Саксі %w/w 0.005 <0.005 79298-B-4 0.01 || 0.01 || RPD: 0 [NR] [NR] Inorg-064 Сар %w/w 0.005 < 0.005 79298-B-4 <0.005 || <0.005 [NR] Inorg-064 [NR] CaA %w/w 0.005 Inorg-064 <0.005 79298-B-4 <0.005 || <0.005 LCS-1 93% **Mg**kcı %w/w 0.005 < 0.005 79298-B-4 < 0.005 || 0.005 Inorg-064 [NR] [NR] MgP %w/w < 0.005 79298-B-4 0.005 Inorg-064 <0.005 || <0.005 [NR] [NR] MgA 0.005 Inorg-064 < 0.005 79298-B-4 <0.005 || <0.005 [NR] %w/w [NR] Shci S %w/w 0.005 Inorg-064 < 0.005 79298-B-4 <0.005 || <0.005 [NR] [NR] SNAS S moles 5 Inorg-064 <5 79298-B-4 <5||<5 [NR] [NR] a-S_{NAS} H⁺/t 79298-B-4 %w/w 0.01 Inorg-064 < 0.01 <0.01||<0.01 [NR] [NR] s-SNAS S Fineness Factor Inorg-064 79298-B-4 1.5 || 1.5 || RPD: 0 [NR] 1.5 <1.5 [NR] a-Net Acidity moles 10 Inorg-064 <10 79298-B-4 44 | 34 | RPD: 26 LCS-1 117% H⁺/t Liming rate 0.75 Inorg-064 < 0.75 79298-B-4 3.3 || 2.5 || RPD: 28 LCS-1 116% kg CaCO3

Spike Sm#

[NR]

[NR]

Spike % Recovery

[NR]

[NR]

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results
sPOCAS					OH#	Base II Duplicate II %RPD
a-Net Acidity without	moles	10	Inorg-064	<10	79298-B-4	NA NA
ANCE Liming rate without ANCE	H ⁺ /t kg	0.75	Inorg-064	<0.75	79298-B-4	NA NA
	CaCO ₃	00	meng ee i	10.1.0	. 0200 2 .	
QUALITYCONTROL	UNITS		Uup. Sm#		Duplicate Duplicate	
sPOCAS	ONTE	´ '	Б ир. ОПі#		Duplicate+%RP	D
 Date prepared	-	79	9298-B-33	15/10/2	012 15/10/201	2
Date analysed	-		9298-B-33		'' 012 15/10/201	
pH kd	pH uni	ts 79	9298-B-33		 4.3 RPD:0	
TAA pH 6.5	moles	79	9298-B-33	25	27 RPD:8	
	H ⁺ /t					
s-TAA pH 6.5	%w/w		9298-B-33	•	0.04 RPD:0	
pH ox	pH uni	ts 79	9298-B-33	•	4.1 RPD:2	
TPA pH 6.5	moles H ⁺ /t	79	9298-B-33	12	12 RPD:0	
s-TPA pH 6.5	%w/w	S 79	9298-B-33	0.02	0.02 RPD:0	
TSA pH 6.5	moles H ⁺ /t	79	9298-B-33		<5 <5	
s-TSA pH 6.5	%w/w	S 79	9298-B-33	<(0.01 <0.01	
ANCE	% CaCO		9298-B-33	<(0.05 <0.05	
a-ANCe	moles H ⁺ /t	79	9298-B-33		<5 <5	
s-ANCe	%w/w	S 79	9298-B-33	<(0.05 <0.05	
Skci	%w/w	S 79	9298-B-33	<0.	005 <0.005	
Sp	%w/v	v 79	9298-B-33	<0	.005 0.007	
Spos	%w/v	v 79	9298-B-33	<0	.005 0.007	
a-Spos	moles H ⁺ /t	79	9298-B-33		<5 <5	
Саксі	%w/v	v 79	9298-B-33	0.01	0.01 RPD:0	
Сар	%w/v	v 79	9298-B-33	0.01	0.01 RPD:0	
Сад	%w/v	v 79	9298-B-33	<0.	005 <0.005	
Мдксі	%w/v	v 79	9298-B-33	0.006	0.006 RPD:0	
MgP	%w/v	v 79	9298-B-33	0.006	0.008 RPD: 29)
MgA	%w/v	v 79	9298-B-33	<0.	005 <0.005	
Shci	%w/w	S 79	9298-B-33	<0.	005 <0.005	
Snas	%w/w	S 79	9298-B-33	<0.	005 <0.005	
a-Snas	moles H ⁺ /t	79	9298-B-33		<5 <5	
s-Snas	%w/w	S 79	9298-B-33	<(0.01 <0.01	
Fineness Factor	-	79	9298-B-33	1.5	1.5 RPD:0	
a-Net Acidity	moles H ⁺ /t	79	9298-B-33	27	32 RPD:17	

QUALITY CONTROL sPOCAS	UNITS	Dup. Sm#	Duplicate Base+Duplicate+%RPD
Liming rate	kg CaCO3	79298-B-33	2.0 2.4 RPD:18
a-Net Acidity without ANCE	moles H ⁺ /t	79298-B-33	NA NA
Liming rate without ANCE	kg CaCO3	79298-B-33	NA NA

Report Comments:

Asbestos ID was analysed by Approved Identifier:

Asbestos ID was authorised by Approved Signatory:

Not applicable for this job

Not applicable for this job

INS: Insufficient sample for this test PQL: Practical Quantitation Limit NT: Not tested NA: Test not required RPD: Relative Percent Difference NA: Test not required

<: Less than >: Greater than LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike: A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample): This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

Envirolab Reference: 79298-B Page 9 of 9

Revision No: R 00

10 Attachment – D DCP n counts



Dynamic Cone Penetrometer Test Log Summary



6 / 37 Leighton Place, Hornsby, NSW 2159, Ph: (02) 9476 9999 Fax: (02) 9476 8767, mail@martens.com.au, www.martens.com.au

Site	Geore Evans Road	DCP Group Reference	2863
Client	Set Consulting	Log Date	19-20 September 2012
Logged by	BM/ JF		
Checked by	AN		
Comments			

TEST DATA

				ILSI DAIA				
Depth Interval (m)	101	106	107	109	110	132	130	Design
0.15	12	1	10	3	2	2	15	1
0.30	20	3		15	10	8	15	3
0.45	20	7	Bounce @0.3	22		16	7	7
0.60	21	8		26	Bounce @0.4	17	28/	8
0.75	0.045	15		D 00.5		19	12	12
0.90	Bounce @ 0.65	20		Bounce @0.5		15	12	12
1.05		Bounce @0.85				00.05	10	10
1.20						Bounce @0.85	9	9
1.35							9	9
1.50							11	11
1.65 1.80							11	11 11
1.95							11	11
2.10							15	15
2.25							20	20
2.23							20	20
							Bounce @2.2	
							2001100 02.2	
		<u> </u>			<u> </u>	<u> </u>	l	

11 Attachment E - Notes About This Report



11 Attachment E - Notes About This Report





Important Information About Your Report

Subsurface conditions cause more construction problems than any other factor. These notes have been prepared by Martens to help you interpret and understand the limitations of your report. Not all of course, are necessarily relevant to all reports, but are included as general reference.

Engineering Reports - Limitations

Geotechnical reports are based on information gained from limited sub-surface site testing and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretative rather than factual documents, limited to some extent by the scope of information on which they rely.

Engineering Reports – Project Specific Criteria

Engineering reports are prepared by qualified personnel and are based on the information obtained, on current engineering standards of interpretation and analysis, and on the basis of your unique project specific requirements as understood by Martens. Project criteria typically include the general nature of the project; its size and configuration; the location of any structures on the site; other site improvements; the presence of underground utilities; and the additional risk imposed by scope-of-service limitations imposed by the Client.

Where the report has been prepared for a specific design proposal (eg. a three storey building), the information and interpretation may not be relative if the design proposal is changed (eg. to a twenty storey building). Your report should not be relied upon if there are changes to the project without first asking Martens to assess how factors that changed subsequent to the date of the report affect the report's recommendations. Martens will not accept responsibility for problems that may occur due to design changes if they are not consulted.

Engineering Reports – Recommendations

Your report is based on the assumption that the site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area. This assumption often cannot be substantiated until project implementation has commenced and therefore your site investigation report recommendations should only be regarded as preliminary.

Only Martens, who prepared the report, are fully familiar with the background information needed to assess whether or not the report's recommendations are valid and whether or not changes should be considered as the project develops. If another party undertakes the implementation of the recommendations of this report there is a risk that the report will be misinterpreted and Martens cannot be held responsible for such misinterpretation.

Engineering Reports – Use For Tendering Purposes

Where information obtained from this investigation is provided for tendering purposes, Martens recommend that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. Attention is drawn to the document 'Guidelines for the Provision of Geotechnical Information in Tender Documents', published by the Institution of Engineers, Australia.

The Company would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Engineering Reports – Data

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way.

Logs, figures, drawings etc are customarily included in a Martens report and are developed by scientists, engineers or geologists based on their interpretation of field logs (assembled by field personnel) and laboratory evaluation of field samples. These data should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

Engineering Reports – Other Projects

To avoid misuse of the information contained in your report it is recommended that you confer with Martens before passing your report on to another party who may not be familiar with the background and the purpose of the report. Your report should not be applied to any project other than that originally specified at the time the report was issued.

Subsurface Conditions - General

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical aspects, relevant standards and recommendations or suggestions for design and construction. However, the Company cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions the potential for will depend partly on test point (eg. excavation or borehole) spacing and sampling frequency which are often limited by project imposed budgetary constraints.
- Changes in guidelines, standards and policy or interpretation of guidelines, standards and



policy by statutory authorities.

- The actions of contractors responding to commercial pressures.
- Actual conditions differing somewhat from those inferred to exist, because no professional, no matter how qualified, can reveal precisely what is hidden by earth, rock and time.

The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions

If these conditions occur, the Company will be pleased to assist with investigation or advice to resolve the matter.

Subsurface Conditions - Changes

Natural processes and the activity of man create subsurface conditions. For example, water levels can vary with time, fill may be placed on a site and pollutants may migrate with time. Reports are based on conditions which existed at the time of the subsurface exploration.

Decisions should not be based on a report whose adequacy may have been affected by time. If an extended period of time has elapsed since the report was prepared, consult Martens to be advised how time may have impacted on the project.

Subsurface Conditions - Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those that were expected from the information contained in the report, the Company requests that it immediately be notified. Most problems are much more readily resolved at the time when conditions are exposed, rather than at some later stage well after the event.

Report Use By Other Design Professionals

To avoid potentially costly misinterpretations when other design professionals develop their plans based on a report, retain Martens to work with other project professionals who are affected by the report. This may involve Martens explaining the report design implications and then reviewing plans and specifications produced to see how they have incorporated the report findings.

Subsurface Conditions - Geoenvironmental Issues

Your report generally does not relate to any findings, conclusions, or recommendations about the potential for hazardous or contaminated materials existing at the site unless specifically required to do so as part of the Company's proposal for works.

Specific sampling guidelines and specialist equipment, techniques and personnel are typically used to perform geoenvironmental or site contamination assessments. Contamination can create major health, safety and environmental risks. If you have no information about the potential for your site to be contaminated or create an environmental hazard, you are advised to contact Martens for information relating to such matters.

Responsibility

Geotechnical reporting relies on interpretation of factual information based on professional judgment and opinion and has an inherent level of uncertainty attached to it and is typically far less exact than the design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded.

To help prevent this problem, a number of clauses have been developed for use in contracts, reports and other documents. Responsibility clauses do not transfer appropriate liabilities from Martens to other parties but are included to identify where Martens' responsibilities begin and end. Their use is intended to help all parties involved to recognize their individual responsibilities. Read all documents from Martens closely and do not hesitate to ask any questions you may have.

Site Inspections

Martens will always be pleased to provide engineering inspection services for aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site. Martens is familiar with a variety of techniques and approaches that can be used to help reduce risks for all parties to a project, from design to construction.

Explanation of Terms (1 of 3)

Definitions

In engineering terms, soil includes every type of uncemented or partially cemented inorganic or organic material found in the ground. In practice, if the material does not exhibit any visible rock properties and can be remoulded or disintegrated by hand in its field condition or in water it is described as a soil. Other materials are described using rock description terms.

The methods of description and classification of soils and rocks used in this report are based on Australian Standard 1726 and the S.A.A Site Investigation Code. In general, descriptions cover the following properties - strength or density, colour, structure, soil or rock type and inclusions.

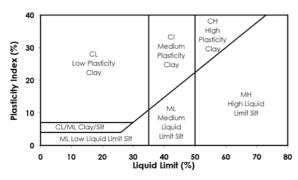
Particle Size

Soil types are described according to the predominating particle size, qualified by the grading of other particles present (eg. sandy clay). Unless otherwise stated, particle size is described in accordance with the following table.

Division	Subdivision	Size	
BOULDERS		>200 mm	
COBBLES		60 to 200 mm	
	Coarse	20 to 60 mm	
GRAVEL	Medium	6 to 20 mm	
	Fine	2 to 6 mm	
	Coarse	0.6 to 2.0 mm	
SAND	Medium	0.2 to 0.6 mm	
	Fine	0.075 to 0.2 mm	
SILT		0.002 to 0.075 mm	
CLAY		< 0.002 mm	

Plasticity Properties

Plasticity properties can be assessed either in the field by tactile properties, or by laboratory procedures.



Moisture Condition

Dry Looks and feels dry. Cohesive and cemented soils are hard, friable or powdery. Uncemented granular soils run freely through hands.

Moist Soil feels cool and damp and is darkened in colour. Cohesive soils can be moulded. Granular soils tend to cohere.

Wet As for moist but with free water forming on hands when handled.

Consistency of Cohesive Soils

Cohesive soils refer to predominantly clay materials.

Term	C₀ (kPa)	Approx SPT "N"	Field Guide
Very Soft	<12	2	A finger can be pushed well into the soil with little effort.
Soft	12 - 25	2 to 4	A finger can be pushed into the soil to about 25mm depth.
Firm	25 - 50	4 – 8	The soil can be indented about 5mm with the thumb, but not penetrated.
Stiff	50 - 100	8 – 15	The surface of the soil can be indented with the thumb, but not penetrated.
Very Stiff	100 - 200	15 – 30	The surface of the soil can be marked, but not indented with thumb pressure.
Hard	> 200	> 30	The surface of the soil can be marked only with the thumbnail.
Friable	-		Crumbles or powders when scraped by thumbnail

Density of Granular Soils

Non-cohesive soils are classified on the basis of relative density, generally from the results of standard penetration test (SPT) or Dutch cone penetrometer tests (CPT) as below:

Relative Density	%	SPT 'N' Value (blows/300mm)	CPT Cone Value (qc Mpa)
Very loose	< 15	< 5	< 2
Loose	15 – 35	5 - 10	2 -5
Medium dense	35 – 65	10 - 30	5 - 15
Dense	65- 85	30 - 50	15 - 25
Very dense	> 85	> 50	> 25

Minor Components

Minor components in soils may be present and readily detectable, but have little bearing on general geotechnical classification. Terms include:

Term	Assessment	Proportion of Minor component In:
Turner	Presence just detectable by feel or eye, but soil properties	Coarse grained soils: < 5 %
Trace of	little or no different to general properties of primary component.	Fine grained soils: < 15 %
With some	Presence easily detectable by feel or eye, soil properties little	Coarse grained soils: 5 – 12 %
**************************************	different to general properties of primary component.	Fine grained soils: 15 – 30 %





Soil Data

Explanation of Terms (2 of 3)

Soil Agricultural Classification Scheme

In some situations, such as where soils are to be used for effluent disposal purposes, soils are often more appropriately classified in terms of traditional agricultural classification schemes. Where a Martens report provides agricultural classifications, these are undertaken in accordance with descriptions by Northcote, K.H. (1979) The factual key for the recognition of Australian Soils, Rellim Technical Publications, NSW, p 26 - 28.

Symbol	Field Texture Grade	Behaviour of moist bolus	Ribbon length	Clay content (%)
S	Sand	Coherence nil to very slight; cannot be moulded; single grains adhere to fingers	0 mm	< 5
LS	Loamy sand	Slight coherence; discolours fingers with dark organic stain	6.35 mm	5
CLS	Clayey sand	Slight coherence; sticky when wet; many sand grains stick to fingers; discolours fingers with clay stain	6.35mm - 1.3cm	5 - 10
SL	Sandy loam	Bolus just coherent but very sandy to touch; dominant sand grains are of medium size and are readily visible	1.3 - 2.5	10 - 15
FSL	Fine sandy loam	Bolus coherent; fine sand can be felt and heard	1.3 - 2.5	10 - 20
SCL-	Light sandy clay loam	Bolus strongly coherent but sandy to touch, sand grains dominantly medium size and easily visible	2.0	15 - 20
L	Loam	Bolus coherent and rather spongy; smooth feel when manipulated but no obvious sandiness or silkiness; may be somewhat greasy to the touch if much organic matter present	2.5	25
Lfsy	Loam, fine sandy	Bolus coherent and slightly spongy; fine sand can be felt and heard when manipulated	2.5	25
SiL	Silt loam	Coherent bolus, very smooth to silky when manipulated	2.5	25 + > 25 silt
\$CL	Sandy clay loam	Strongly coherent bolus sandy to touch; medium size sand grains visible in a finer matrix	2.5 - 3.8	20 - 30
CL	Clay loam	Coherent plastic bolus; smooth to manipulate	3.8 - 5.0	30 - 35
SiCL	Silty clay loam	Coherent smooth bolus; plastic and silky to touch	3.8 - 5.0	30- 35 + > 25 silt
FSCL	Fine sandy clay loam	Coherent bolus; fine sand can be felt and heard	3.8 - 5.0	30 - 35
SC	Sandy clay	Plastic bolus; fine to medium sized sands can be seen, felt or heard in a clayey matrix	5.0 - 7.5	35 - 40
SiC	Silty clay	Plastic bolus; smooth and silky	5.0 - 7.5	35 - 40 + > 25 silt
LC	Light clay	Plastic bolus; smooth to touch; slight resistance to shearing	5.0 - 7.5	35 - 40
LMC	Light medium clay	Plastic bolus; smooth to touch, slightly greater resistance to shearing than LC	7.5	40 - 45
МС	Medium clay	Smooth plastic bolus, handles like plasticine and can be moulded into rods without fracture, some resistance to shearing	> 7.5	45 - 55
НС	Heavy clay	Smooth plastic bolus; handles like stiff plasticine; can be moulded into rods without fracture; firm resistance to shearing	> 7.5	> 50



Symbols for Soil and Rock

SOIL		SEDIMENTARY ROCK		IGNEOUS ROCK	IGNEOUS ROCK
COBBLES / BOULDERS	X X SILT (ML or MH)	BOULDER CONGLOMERATE	CLAYSTONE	+ + + + GRANITE	SLATE, PHYLLITE SCHIST
GRAVEL (GP or GW)	CLAY (CL or CI)	CONGLOMERATE	SHALE	DOLERITE / BASALT	GNEISS
SILTY GRAVEL (GM)	ALLUVIUM	CONGLOMERATE SANDSTONE	COAL		
CLAYEY GRAVEL (GC)	FILL	SANDSTONE, QUARTZITE	LIMESTONE		
SAND (SP or SW)	TALUS	SILTSTONE	TUFF		
SILTY SAND (SM)	TOPSOIL	LAMINITE			
CLAYEY SAND (SC)		MUDSTONE			

Unified Soil Classification Scheme (USCS)

FIELD IDENTIFICATION PROCEDURES (Excluding particles larger than 63 mm and basing fractions on estimated mass)						uscs	Primary Name		
0.075			iction is	AN ZELS or no	V	Vide range in grain siz	ze and substantial amounts of all intermediate particle sizes.	GW	Gravel
ger than		GRAVELS More than half of coarse fraction is larger than 2.0 mm.	CLEAN GRAVELS (Little or no fines)		Predominantly one	size or a range of sizes with more intermediate sizes missing	GP	Gravel	
SOILS 3 mm is lar	(e)	GRA Ian half of larger tha	GRAVELS WITH FINES (Appreciable amount of fines)		Non-plastic fine	es (for identification procedures see ML below)	GM	Silty Gravel	
SRAINED SC ss than 63 mm	aked ey	More th	GRAVE WITH FIN (Apprecia		Plastic fines	(for identification procedures see CL below)	GC	Clayey Gravel	
COARSE GRAINED naterial less than 6 mm	to the r	ction is	AN DS or no s)		Wide range in grain	n sizes and substantial amounts of intermediate sizes missing.	SW	Sand	
COARSE GRAINED SOILS More than 50 % of material less than 63 mm is larger than 0.075 mm	about the smallest particle visible to the naked eye)	SANDS More than half of coarse fraction is smaller than 2.0 mm	CLEAN SANDS (Little or no fines)		Predominantly one	size or a range of sizes with some intermediate sizes missing	SP	Sand	
han 50 %	est partic	SAN an half of smaller tha	; WITH ES ciable int of		Non-plastic fine	es (for identification procedures see ML below)	SM	Silty Sand	
More t	ne smalle	More th	SANDS WITH FINES (Appreciable amount of fines)		Plastic fines	(for identification procedures see CL below)	SC	Clayey Sand	
	the the				IDENTIFICATIO	N PROCEDURES ON FRACTIONS < 0.2 MM			
s3 mm is	.∽	DRY STRENG (Crushing Characteristi	DILATA	NCY	TOUGHNESS	DESCRIPTION	uscs	Primary Name	
ILS s than 6 mm	0.075 mm particle	None to Lo	Quick Slow		None	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands with slight plasticity	ML	Silt	
VED SOILS erial less th	075 mn	Medium t High	o Non	е	Medium	Inorganic clays of low to medium plasticity, gravely clays, sandy clays, silty clays, lean clays	CL	Clay	
FINE GRAINED SOILS 50 % of material less tha smaller than 0.075 mm	(A 0.0	Low to Medium	Slow to Slov	,	Low	Organic slits and organic silty clays of low plasticity	OL	Organic Silt	
FINE GRAINED SOILS More than 50 % of material less than 63 mm is smaller than 0.075 mm		Low to Slow Medium		,	y Low to Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts		МН	Silt	
tore the		High	High None		High	High Inorganic clays of high plasticity, fat clays		Clay	
		Medium to High None		е	Low to Medium	Organic clays of medium to high plasticity	ОН	Organic Silt	
	HIGHLY ORGANIC Readily identified by colour, odour, spongy feel and frequently by fibrous texture SOILS						Pt	Peat	
_ow Plastici	ty – Lie	quid Limit W _L	< 35 % Me	dium	Plasticity – Liquid li	imit W_L 35 to 60 $\%$ High Plasticity - Liquid limit V	V _L > 60 %		



Explanation of Terms (1 of 2)

Definitions

Descriptive terms used for Rock by Martens are given below and include rock substance, rock defects and rock mass.

Rock Substance In geotechnical engineering terms, rock substance is any naturally occurring aggregate of minerals and organic matter which cannot, unless extremely weathered, be disintegrated or remoulded by hand in air or water. Other material is described using soil descriptive terms. Rock substance is effectively homogeneous and may be

isotropic or anisotropic.

Rock Defect Discontinuity or break in the continuity of a substance or substances.

Rock Mass Any body of material which is not effectively homogeneous. It can consist of two or more substances without

defects, or one or more substances with one or more defects.

Degree of Weathering

Rock weathering is defined as the degree in rock structure and grain property decline and can be readily determined in the field.

Term	Symbol	Definition
Residual Soil	Rs	Soil derived from the weathering of rock. The mass structure and substance fabric are no longer evident. There is a large change in volume but the soil has not been significantly transported.
Extremely weathered	EW	Rock substance affected by weathering to the extent that the rock exhibits soil properties - ie. it can be remoulded and can be classified according to the Unified Classification System, but the texture of the original rock is still evident.
Highly weathered	HW	Rock substance affected by weathering to the extent that limonite staining or bleaching affects the whole of the rock substance and other signs of chemical or physical decomposition are evident. Porosity and strength may be increased or decrease compared to the fresh rock usually as a result of iron leaching or deposition. The colour and strength of the original rock substance is no longer recognisable.
Moderately weathered	MW	Rock substance affected by weathering to the extent that staining extends throughout the whole of the rock substance and the original colour of the fresh rock is no longer recognisable.
Slightly weathered	SW	Rock substance affected by weathering to the extent that partial staining or discolouration of the rock substance usually by limonite has taken place. The colour and texture of the fresh rock is recognisable.
Fresh	Fr	Rock substance unaffected by weathering

Rock Strength

Rock strength is defined by the Point Load Strength Index (Is 50) and refers to the strength of the rock substance is the direction normal to the bedding. The test procedure is described by the International Society of Rock Mechanics.

Term	Is (50) MPa	Field Guide	Symbol
Extremely weak	< 0.03	Easily remoulded by hand to a material with soil properties.	EW
Very weak	0.03 - 0.1	May be crumbled in the hand. Sandstone is 'sugary' and friable.	vw
Weak	0.1 - 0.3	A piece of core 150mm long x 50mm diameter may be broken by hand and easily scored with a knife. Sharp edges of core may be friable and break during handling.	w
Medium strong	0.3 - 1	A piece of core 150mm long x 50mm diameter can be broken by hand with considerable difficulty. Readily scored with a knife.	MS
Strong	1 - 3	A piece of core 150mm long x 50mm diameter cannot be broken by unaided hands, can be slightly scratched or scored with a knife.	S
Very Strong	3 - 10	A piece of core 150mm long x 50mm diameter may be broken readily with hand held hammer. Cannot be scratched with pen knife.	VS
Extremely strong	> 10	A piece of core 150mm long x 50mm diameter is difficult to break with hand held hammer. Rings when struck with a hammer.	ES





Explanation of Terms (2 of 2)

Degree of Fracturing

This classification applies to diamond drill cores and refers to the spacing of all types of natural fractures along which the core is discontinuous. These include bedding plane partings, joints and other rock defects, but excludes fractures such as drilling breaks.

Term	Description	
Fragmented The core is comprised primarily of fragments of length less than 20mm, and mostly of width less than core diameter.		
Highly fractured	Core lengths are generally less than 20mm-40mm with occasional fragments.	
Fractured	Core lengths are mainly 30mm-100mm with occasional shorter and longer sections.	
Slightly fractured	Core lengths are generally 300mm-1000mm with occasional longer sections and occasional sections of 100mm-300mm.	
Unbroken	The core does not contain any fractures.	



Test Methods

Explanation of Terms (1 of 2)

Sampling

Sampling is carried out during drilling or excavation to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provide information on colour, type, inclusions and, depending upon the degree of disturbance, some information on strength and structure.

Undisturbed samples may be taken by pushing a thin-walled sample tube into the soils and withdrawing a soil sample in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils. Other sampling methods may be used. Details of the type and method of sampling are given in the report.

Drilling Methods

The following is a brief summary of drilling methods currently adopted by the Company and some comments on their use and application.

<u>Hand Excavation</u> – in some situations, excavation using hand tools such as mattock and spade may be required due to limited site access or shallow soil profiles.

<u>Hand Auger</u> - the hole is advanced by pushing and rotating either a sand or clay auger generally 75-100mm in diameter into the ground. The depth of penetration is usually limited to the length of the auger pole, however extender pieces can be added to lengthen this.

<u>Test Pits</u> - these are excavated with a backhoe or a tracked excavator, allowing close examination of the *insitu* soils if it is safe to descend into the pit. The depth of penetration is limited to about 3m for a backhoe and up to 6m for an excavator. A potential disadvantage is the disturbance caused by the excavation.

Large Diameter Auger (eg. Pengo) - the hole is advanced by a rotating plate or short spiral auger, generally 300mm or larger in diameter. The cuttings are returned to the surface at intervals (generally of not more than 0.5m) and are disturbed but usually unchanged in moisture content. Identification of soil strata is generally much more reliable than with continuous spiral flight augers, and is usually supplemented by occasional undisturbed tube sampling.

<u>Continuous Sample Drilling</u> - the hole is advanced by pushing a 100mm diameter socket into the ground and withdrawing it at intervals to extrude the sample. This is the most reliable method of drilling in soils, since moisture content is unchanged and soil structure, strength *etc.* is only marginally affected.

<u>Continuous Spiral Flight Augers</u> - the hole is advanced using 90 - 115 mm diameter continuous spiral flight augers which are withdrawn at intervals to allow sampling or *insitu* testing. This is a relatively economical means of drilling in clays and in sands above the water table. Samples are returned to the surface or, or may be collected after withdrawal of the auger flights, but they are very disturbed and may be contaminated. Information from the drilling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively lower reliability, due to remoulding, contamination or softening of samples by ground water.

Non-core Rotary Drilling - the hole is advanced by a rotary bit, with water being pumped down the drill rods and

returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from 'feel' and rate of penetration.

Rotary Mud Drilling - similar to rotary drilling, but using drilling mud as a circulating fluid. The mud tends to mask the cuttings and reliable identification is again only possible from separate intact sampling (eg. from SPT).

<u>Continuous Core Drilling</u> - a continuous core sample is obtained using a diamond tipped core barrel, usually 50mm internal diameter. Provided full core recovery is achieved (which is not always possible in very weak rocks and granular soils), this technique provides a very reliable (but relatively expensive) method of investigation.

Standard Penetration Tests

Standard penetration tests are used mainly in non-cohesive soils, but occasionally also in cohesive soils as a means of determining density or strength and also of obtaining a relatively undisturbed sample. The test procedure is described in AS 1289 Methods of Testing Soils for Engineering Purposes - Test F3.1.

The test is carried out in a borehole by driving a 50mm diameter split sample tube under the impact of a 63 kg hammer with a free fall of 760mm. It is normal for the tube to be driven in three successive 150 mm increments and the 'N' value is taken as the number of blows for the last 300mm. In dense sands, very hard clays or weak rock, the full 450mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form:

(i) In the case where full penetration is obtained with successive blow counts for each 150mm of say 4, 6 and 7 blows:

as 4, 6, 7

N = 13

(ii) In a case where the test is discontinued short of full penetration, say after 15 blows for the first 150mm and 30 blows for the next 40mm

as 15, 30/40 mm.

The results of the tests can be related empirically to the engineering properties of the soil. Occasionally, the test method is used to obtain samples in 50mm diameter thin walled sample tubes in clays. In such circumstances, the test results are shown on the borelogs in brackets.

CONE PENETROMETER TESTING AND INTERPRETATION

Cone penetrometer testing (sometimes referred to as Dutch Cone - abbreviated as CPT) described in this report has been carried out using an electrical friction cone penetrometer. The test is described in AS 1289 - Test F4.1.

In the test, a 35mm diameter rod with a cone tipped end is pushed continuously into the soil, the reaction being provided by a specially designed truck or rig which is fitted with an hydraulic ram system. Measurements are made of the end bearing resistance on the cone and the friction resistance on separate 130mm long sleeve, immediately behind the cone. Tranducers in the tip of the assembly are connected by electrical wires passing through the centre of the push rods to an amplifier and recorder unit mounted on the control truck.

As penetration occurs (at a rate of approximately 20mm per second) the information is output on continuous chart



Test Methods

Explanation of Terms (2 of 2)

recorders. The plotted results given in this report have been traced from the original records.

The information provided on the charts comprises: Cone resistance - the actual end bearing force divided by the cross sectional area of the cone - expressed in MPA.

the cross sectional area of the cone - expressed in MPA.

Sleeve friction - the frictional force of the sleeve divided by the surface area - expressed in kPa.

Friction ratio - the ratio of sleeve friction to cone resistance - expressed in percent.

There are two scales available for measurement of cone resistance. The lower (A) scale (0 - 5 Mpa) is used in very soft soils where increased sensitivity is required and is shown in the graphs as a dotted line. The main (B) scale (0 - 50 Mpa) is less sensitive and is shown as a full line.

The ratios of the sleeve resistance to cone resistance will vary with the type of soil encountered, with higher relative friction in clays than in sands. Friction ratios of 1%-2% are commonly encountered in sands and very soft clays rising to 4%-10% in stiff clays.

In sands, the relationship between cone resistance and SPT value is commonly in the range:

 q_c (Mpa) = (0.4 to 0.6) N (blows/300mm)

In clays, the relationship between undrained shear strength and cone resistance is commonly in the range:

 $q_c = (12 \text{ to } 18) c_u$

Interpretation of CPT values can also be made to allow estimation of modulus or compressibility values to allow calculation of foundation settlements.

Inferred stratification as shown on the attached reports is assessed from the cone and friction traces and from experience and information from nearby boreholes etc. This information is presented for general guidance, but must be regarded as being to some extent interpretive. The test method provides a continuous profile of engineering properties, and where precise information on soil classification is required, direct drilling and sampling may be preferable.

DYNAMIC CONE (HAND) PENETROMETERS

Hand penetrometer tests are carried out by driving a rod into the ground with a falling weight hammer and measuring the blows for successive 150mm increments of penetration. Normally, there is a depth limitation of 1.2m but this may be extended in certain conditions by the use of extension rods. Two relatively similar tests are used.

Perth sand penetrometer - a 16 mm diameter flat ended rod is driven with a 9kg hammer, dropping 600mm (AS 1289 - Test F 3.3). This test was developed for testing the density of sands (originating in Perth) and is mainly used in granular soils and filling.

Cone penetrometer (sometimes known as the Scala Penetrometer) - a 16mm rod with a 20mm diameter cone end is driven with a 9kg hammer dropping 510mm (AS 1289 - Test F 3.2). The test was developed initially for pavement sub-grade investigations, with correlations of the test results with California bearing ratio published by various Road Authorities.

LABORATORY TESTING

Laboratory testing is carried out in accordance with AS 1289 Methods of Testing Soil for Engineering Purposes. Details of the test procedure used are given on the individual report forms.

TEST PIT / BORE LOGS

The test pit / bore log(s) presented herein are an engineering and/or geological interpretation of the subsurface conditions and their reliability will depend to some extent on frequency of sampling and the method of excavation / drilling. Ideally, continuous undisturbed sampling or excavation / core drilling will provide the most reliable assessment, but this is not always practicable, or possible to justify on economic grounds. In any case, the boreholes represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes, the frequency of sampling and the possibility of other than 'straight line' variation between the boreholes.

GROUND WATER

Where ground water levels are measured in boreholes, there are several potential problems:

In low permeability soils, ground water although present, may enter the hole slowly, or perhaps not at all during the time it is left open.

A localised perched water table may lead to an erroneous indication of the true water table.

Water table levels will vary from time to time with seasons or recent prior weather changes. They may not be the same at the time of construction as are indicated in the report.

The use of water or mud as a drilling fluid will mask any ground water inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water observations are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

