

Shoalhaven City Council  
C/- Set Consulting Pty Ltd



Stage 1 and 2 Contamination  
Assessment:  
Lot 1/DP1021332 and  
Lot 458/DP1063107  
George Evans Rd, Mundamia, NSW

P1202863JR01V01  
October 2012

ENVIRONMENTAL



WATER



WASTEWATER



GEOTECHNICAL



CIVIL



PROJECT  
MANAGEMENT



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# 1 Overview

## 1.1 Introduction

Martens & Associates Pty Ltd (MA) have been commissioned to carry out a Stage 1 and 2 contamination assessment to support the subdivision of Lot 1, DP1021332 and Lot 458, DP1063107 (the 'site').

## 1.2 Project Scope

The purpose of this assessment is to identify any past or present potentially contaminating activities and to provide a preliminary assessment of site contamination through intrusive soil sampling and laboratory analysis. This assessment is based on the following:

- o Walkover inspection of the site to identify any areas of potential contamination.
- o Review of available Shoalhaven City Council site development consents (i.e. DA and BA consents).
- o Review site title history.
- o Review of historical land title searches.
- o Review of five historic aerial photographs to assess past site and surrounding land use patterns.
- o Review of NSW OEH (formerly NSW EPA) notices under the Contaminated Land Management Act (1997).
- o Preliminary soil sampling with laboratory analysis.

## 2 Site Description

### 2.1 Location and Setting

Site information is summarised in Table 1.

Table 1: Site background information

Site address	George Evans Rd, Mundamia, NSW
Lot and DP (Title Information)	Lot 1, DP1021332 and Lot 458, DP1063107
Local Government Area (LGA)	Shoalhaven City Council
Zoning	Current zoning: 1(d) Rural "D" (General Rural) Draft LEP zoning: R1 (General Residential).
Current land use	Rural / Industrial
Proposed land use	Residential
Surrounding land uses	Predominantly underdeveloped bushland and rural land to the east, the University of Wollongong's Shoalhaven campus is located to the sites southwest.
Geology and soil landscapes	Nowra Sandstone, a subgroup of the Megalong Conglomerate Group geology.  Nowra Landscape consisting of moderately deep (50 – 100cm) brown podzolic soils on crests/upper slopes, with yellow earths or yellow podzolic soils on mid slopes, lower slopes and drainage depressions.
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 as a result of previous quarrying. Drainage is facilitated by a manmade channel that runs north and exits the site beneath Jonsson Rd.
Sensitive receptors	Shoalhaven River located approximately 400m to the north

Site location is shown in Figure 1 and site features relevant to the investigation are shown Attachment A.



Figure 1: Site location



### 3 Site History Review (Stage 1 Investigation)

#### 3.1 Historical Site Records Review

Information derived from review of historical site records is presented in Table 2.

Table 2: Site history information

Information Source	Available Information
NSW WorkCover Dangerous Goods Register Database	No record of historical or current dangerous goods was identified on the record for the site
NSW OEH Records	No notices for the site or areas surrounding the site under the Contaminated Land Management Act (1997) or the Environmentally Hazardous Chemicals Act (1985).
Shoalhaven City Council DA/BA/CC Records	Subdivision of Lot 458/DP1063107 (2002)
	Subdivision of Lot 1/DP1021332 (2009)

#### 3.2 Historical Aerial Photographs

Review of selected recent and historical aerial photographs of the site was conducted, with the observations of the assessment summarised in Table 3. All aerial photographs are available for review in Attachment B.

Table 3: Observations from historic aerial photographs

Year	Site	Surrounding Land
1961	No dwellings can be seen in this aerial. Likely quarry operations seen dominating the southern area of site (white) otherwise bushland surrounds site.	Bushland dominates landscape.
1970	No change to 1961.	Site adjacent to the east has been cleared. No dwellings.

Year	Site	Surrounding Land
1984	Quarry had been expanded across southern portion of the site. A trail leads from Jonsson Rd to the south along the site. Jonsson Road has become more apparent (no longer bush track).	More land has been cleared to the east and north east. Dwellings are visible.
1994	Quarry appears to have stopped with revegetation of portions of the site (possible filling).	Rural development on adjacent land continues to expand to the east. Cleared paddocks, increase in dwellings and a dam has been formed in the south eastern portion of the adjacent site.
2008	Revegetation continues across quarry area.	Vegetation increasing along the boundaries of adjacent land. Dam has increased in size in the southern portion of adjacent land.
2012	Increase in vegetation across quarry area.	Dam has dried up. Otherwise, limited change from 2008.

### 3.3 Summary of Site History

A summary of the site history is as follows:

- o Site's primary use has been as a quarry / gravel pit which included the use of associated machinery (mobile processing plant, excavators *etc*).
- o Aerial photography indicated that the quarry was established by 1961 and extents have generally remained unchanged.
- o Shoalhaven City Council records show that subdivision of Lot 458, DP1063107 (2002) and subdivision of Lot 1, DP1021332 (2009) occurred.
- o Register of notices issued under the Contaminated Land Management Act (1997) or the Environmentally Hazardous Chemicals Act (1985) confirmed the site was not subject to an investigation or remediation order.

### 3.4 Site Walkover

A site inspection was conducted on 19 - 20 September, 2012 and results are summarised in Table 4.

Table 4: Site walkover inspection summary

Site Observations	Uneven ground (mounds and embankments), indicates the possible importation of fill, predominantly in the site's south.
	Suspected areas of filling (noted above) covered in weeds and kikuyu.
	Soil stockpiles located in the site's south and northwest, visual observation indicated fill of unknown origin (confirmed during sub surface investigations).
	Minor refuse across the site including building material, glass and plastics.
	Manmade drainage channel excavated to rock originating in the footprint of the former quarry and extending north, spoil from drainage pit/ channel is stockpiled along the eastern side of the channel in Lot 458, DP1063107.
	Several access tracks / unpaved roads created across the site.
	Northern areas of the site (centre of Lot 458, DP1063107) are heavily vegetated with remnant native vegetation.
	Cleared grass area, adjacent to residential homes in the sites north east was observed.

Based on these findings, areas of environmental concern (AEC) and associated chemicals of concern (COC) have been identified (Table 5).

### 3.5 Areas of Environmental Concern/Chemicals of Concern

Our assessment of site AECs and COCs (Table 5) is made on the basis of available site history (anecdotal and DA records), aerial photograph interpretation and site walkover.

Table 5: Areas of Environmental Concern and Chemicals of Concern

AEC	Primary Use	Potential for contamination	COC	Contamination Likelihood
(A) Footprint of former quarry/ gravel pit	Quarry / gravel pit	Use as a quarry including the use of heavy machinery during quarry operation	Heavy metals, TRH, BTEX, PAH	Low
(B) Fill (entire site)	Fill used across the site, predominantly to the south	Fill of unknown origin and quality potentially contaminated.	Heavy metals, TRH, BTEX, PAH, PCH, OC/OP pesticides, phenols, asbestos	Medium - High
(C) Constructed drainage channel	Manmade drainage channel to facilitate site drainage	No details regarding construction and or machinery used to construct	Heavy metals, TRH, BTEX, PAH	Low

## 4 Preliminary Soil Sampling (Stage 2 Investigation)

### 4.1 Field Investigation

#### 4.1.1 Intrusive Investigation and Soil Sampling

Soils were sampled concurrent with geotechnical investigation on 19 - 20 September, 2012. Soil sampling was completed by a MA environmental engineer in accordance with MA standard operating procedures (Table 6) with testing plan in Attachment A.

Table 6: Soil sampling methods

Type	Number of Locations	Equipment	Description
Borehole	8	Solid flight hydraulic auger / Hand auger	Soils were collected at a range of depths, generally 0.2, 0.5, 0.75 and then at 0.5m intervals (as required to characterise contamination).
Test pit	13	Backhoe	Soil samples collected directly from the centre of the backhoe bucket or from sides of open test pit. Sampled generally at 0.2, 0.5, 0.75 and then at 0.5m intervals (as required to characterise contamination).
Borehole / test pit	13	Hand auger / spade	Soil samples collected from the end of the auger or sides of open pit.
Surface	3	Spade	Soil samples collected from 0.0 - 0.05m.

#### 4.1.2 Sampling Methodology

Soil sampling methodology, completed to meet data quality objectives, is outlined in Table 7.

Table 7: Soil sampling methodology.

Activity	Detail / Comments
Soil logging	Logging of boreholes/test pits was completed by an experienced environmental engineer in accord with MA Standard Operating Procedures (SOP) at all locations.
Soil sampling	Each sample was placed into a laboratory-supplied, acid-rinsed 250mL glass jar with Teflon lined seals and no headspace to limit volatile loss. Each jar was labelled with a unique identification number and placed in an ice-chilled cooler box. A clean pair of disposable gloves was used when handling each sample.
QA / QC sampling	Duplicate samples were collected at a rate of approximately 1 in 10 samples for intra-laboratory analysis. Two trip blanks (TB) and two trip spikes (TS) sample was placed with soil samples in cooler boxes during storage and transportation and tested by the analytical laboratory to assess potential cross contamination between samples.
Sample handling and transportation	Sample collection, storage and transport were conducted according to MA SOP. Samples were dispatched to NATA-accredited laboratories (Envirolab as the primary laboratory) under chain of custody documentation, and within holding times.
Decontamination of sampling equipment	Equipment was decontaminated between sampling locations by pressurised water spray with a solution of Decon-90™, a phosphate-free detergent, followed by rinsing with potable water. Samples collected from test pitting involving the back hoe were sampled directly from the centre of the backhoe bucket or from the walls of the test pit eliminating the need for decontamination between samples.

#### 4.2 Laboratory Analytical Suite

Laboratory analysis was carried out by Envirolab Pty Ltd, a National Association of Testing Authorities (NATA) accredited laboratory. The laboratory analytical documentation is presented in Attachment E.

33 primary soil samples were selected for a suite of laboratory analysis (summarised in Table 8) based on COC identified (Table 5).

Three fibrous material samples, two trip blanks and two trip spikes were also analysed.

Table 8: Summary of primary soil laboratory analyses.

COC	Number of Samples Analysed
BTEX	33
TRH	33
PAH	33
Heavy metals <sup>1</sup>	33
OCP/OPP	17
PCB	17
Phenols	17
Asbestos	23

Notes:

<sup>1</sup> Heavy metals – As, Cd, Cr, Cu, Pb, Hg, Ni, Zn

#### 4.3 Soil Assessment Criteria

Chemical analyses of soil samples are compared to investigation levels for residential land use based on proposed site rezoning.

Investigation levels for soil are established based on the following references:

- o NEPC (1999) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM);
- o NSW DEC (2006) Guidelines for the NSW Auditor Scheme (Second Edition); and
- o NSW EPA (1994) Guidelines for Assessing Service Station Sites.

Human health based soil investigation levels (HIL) for residential land use, provided in Column A of Table 11-A in the NEPC (1999) *Guidelines on Health-Based Investigation Levels* (and reproduced in NSW DEC, 2006) have been adopted as the soil investigation levels. Adopted HIL for BTEX and TRH is derived from NSW EPA (1994). Adopted criteria are outlined in Table .

NEPC (1999) do not provide threshold levels for volatile petroleum hydrocarbon compounds. NSW EPA (1994) provide an indication of acceptable cleanup levels for petroleum hydrocarbons compounds at service station sites to be reused for sensitive land-uses. For semi-volatile petroleum hydrocarbons (TPH C<sub>16</sub> – C<sub>35</sub> and >C<sub>35</sub>) investigation levels are provided in the NEPC (1999) guidelines, which require the laboratory differentiate between aromatic and aliphatic compounds.



If this is not done, the TPH C<sub>10</sub> – C<sub>40</sub> criteria in the service station guidelines are applied.

Table 9: Adopted soil health investigation levels (HIL)

Contaminant of Concern	Soil Criteria (mg/kg)
TRH (C <sub>6</sub> -C <sub>9</sub> )	65
TRH (C <sub>10</sub> -C <sub>36</sub> )	1,000
Benzene	1
Toluene	1.4
Ethyl benzene	3.1
Xylene (total)	14
Total PAH	20
Benzo(a)pyrene	1
Total Phenols	8,500
Aldrin + Dieldrin	10
Chlordane	50
DDT + DDD + DDE	200
Heptachlor	10
PCB (total)	10
Arsenic (total)	100
Cadmium	20
Chromium (III)	120,000
Chromium (IV)	100
Copper	1,000
Lead	300
Mercury	15
Nickel	600
Zinc	7000

#### 4.4 Quality Assurance and Quality Control Assessment

A review of QA/QC procedure has been completed and is present in the data validation report (Attachment F). The report concludes that data is suitable for the purposes of the assessment.

## 5 Results

### 5.1 Subsurface Investigation

Subsurface conditions have been divided into separate geotechnical land units (Table 10). Due to the size of the site and limited investigation, division into geotechnical units is broad and variability may exist within each unit.

Table 10: Geotechnical land units

Unit	Relevant BH/TP/SS	Description
1	BH101, BH106	Stiff natural clay – dark brown / red overlaying weathered sandstone.
2	BH107, BH109, BH110	Gravely sandy topsoil overlaying shallow weathered sandstone. Grading to medium strong sand stone with depth.
3	BH115, BH123, SS114, SS119, SS122	Predominantly exposed sandstone from previous quarrying. Minimal (<20% of the area) silty sand topsoil.
4	TP117, TP118, TP124, TP125, TP126 – TP128, BH129, BH130, TP131, BH132, BH133, TP134, TP136	Clayey sand overlaying sandy clays. Grades to weathered sandstone with depth.
5	BH116, BH120, BH138, TP102 - TP105, TP108, TP111, TP112, TP113	Fill - clay, silty and sandy clay with various inclusion (Section 5.2).

### 5.2 Fill

Subsurface investigations confirmed the presents of fill on site to a depth of 2.3 mbgl (TP108). Attachment A provides an approximate outline of areas designated as fill. Identified inclusions in fill include:

- o Sandstone cobble and boulders.
- o Bricks.
- o Concrete slabs.
- o Steel bars and reinforcement.
- o Treated pine.
- o Plastics.

- o Glass.

Additionally, three pieces of fibrous sheeting were found at various investigation points within the fill areas at a depth range of 0.1-1.1 mbgl. These were sent to the laboratory to test for the presence of asbestos.

### 5.3 Laboratory Analytical Results

#### 5.3.1 Soil

Soil analytical laboratory results from the investigations were compared against adopted soil investigation levels and are summarised below:

- o All analyses for BTEX compounds were below LOR.
- o All analyses for TRH (C<sub>10</sub>-C<sub>36</sub>) were below LOR or below adopted HIL.
- o Benzo(a)pyrene concentrations exceeding adopted HIL criteria at 2863/103/1.2 (4.7 mg/kg) and 2863/138/0.5 (2.0 mg/kg).
- o Total PAH exceeded adopted HIL in 2863/103/1.2 (53.7 mg/kg) and 2863/138/0.5 (25.2 mg/kg). PAH concentrations from remaining samples were below adopted HIL.
- o Lead concentrations exceeded adopted HIL criteria at 2863/105/0.2 (310 mg/kg). Remaining sample heavy metal concentrations were below adopted HIL.
- o Samples analysed for OCP/OPP, PCB, total phenols and asbestos in soil were at concentration below LOR and HIL.

#### 5.3.2 Material

Three fibrous material samples analysed all returned positive for asbestos. Samples were collected from TP103 and TP104

## 5.4 Discussion

Contamination was identified at the following testing locations:

- PAH levels exceeding adopted HIL at TP103 and BH138.
- Lead exceeding adopted HIL at TP105.
- Asbestos containing material (fibre sheeting) found in TP103 and TP104.

Site testing to date indicates that site contamination is confined to areas identified as fill. Samples with contamination levels above HIL were taken from a depth range of 0.2 - 2.2 mbgl and fibre sheeting was sampled from a depth range of 0.1 – 1.2 indicating that potential contamination exists throughout the entire fill profile. Attachment A provides a preliminary outline of areas defined as fill.

## 6 Conclusions and Recommendations

### 6.1 Conclusions

Site history has indicated past use as a quarry and importation of fill from unknown sources. Site filling was later confirmed during subsurface investigations. A search of the NSW Office of Environment and Heritage and Workcover databases revealed no land contamination notices issued. A review of historic aerial photographs revealed no formal site use other than as a quarry to present day.

Laboratory analysis of soil samples reveal PAH contamination at TP103 and BH138 and minor lead contamination at BH105. Material samples collected from TP103 and TP104 contained asbestos.

All identified contamination has association with fill material. Preliminary distribution of this material is outlined in Attachment A. Completed testing indicates that the site is unfit for the intended residential use without remediation. Importantly, remediation required is limited to the remediation of identified contaminated fill.

### 6.2 Recommendations

A remediation action plan (RAP) is to be prepared for the site to assess options and make recommendations for the site's remediation. Further testing may be required to fully delineate the extent of site filling and to assess the possibility of contamination of observed groundwater. Issues of fill extend and groundwater issues may be dealt with by the RAP. Waste classification of any material to be removed from site would be required.

## 7 Limitation Statement

This Stage 1 and 2 contamination assessment was undertaken in accordance with current industry standards.

It is important to note that no land contamination study can be considered to be a complete and exhaustive characterisation of a site nor can it be guaranteed that any assessment shall identify and characterise all areas of potential contamination or all past potentially contaminating land-uses. Therefore, this report should not be read as a guarantee that only contamination identified shall be found on the site. Should material be exposed in future which appears to be contaminated, additional testing may be required to determine the implications for the site.

Martens & Associates Pty Ltd has undertaken this assessment for the purposes of assessing potential site contamination. No reliance on this report should be made for any other investigation or proposal. Martens & Associates accepts no responsibility, and provides no guarantee regarding the characteristics of areas of the site not specifically studied in this investigation.

## 8 References

Chapman and Murphy (1983) Wollongong 1:100 000 Soil Landscapes Sheet 9130.

Department of Mineral Resources (1983) Wollongong 1:100,000 Geological Sheet 9130.

NEPC (1999) National Environmental Protection Measure, 1999 (site contamination measure).

NSW DEC (2006) 2<sup>nd</sup> Ed. Contaminated Sites: Guidelines for the NSW Site Auditor Scheme.

NSW DUAP/EPA (1998), "*SEPP 55 Managing Land Contamination, Planning Guidelines, Remediation of Land*";

NSW EPA (1994) Contaminated Sites: Guidelines for Assessing Service Station Sites.

NSW OEH (2011) *Sampling Design Guidelines*.

NSW OEH (2011) Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites.

## 9 Attachment A – Site Plan





KEY

BH 105

BOREHOLE LOCATION

TP 105

TEST PIT LOCATION

SS 105

SURFACE SAMPLE LOCATION

SITE BOUNDARY

ASBESTOS CONTAMINATION IN CEMENT FIBRE SHEETING

PAGE BAR SCALE

0

30

60

90

120

150

UNITS - METRES

SCALE - 1:1500 @ A1 1:3000 @ A3

Martens & Associates Pty Ltd		ABN 85 070 240 890	Environment   Water   Wastewater   Geotechnical   Civil   Management				
Drawn:	BM	TESTING PLAN			Drawing No./ID:		
Approved:	AN				1002863JD01V01		
Date:	04.10.12						
Scale @A3:	1:3000	6/37 Leighton Place, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767 Email: <a href="mailto:mail@martens.com.au">mail@martens.com.au</a> Internet: <a href="http://www.martens.com.au">http://www.martens.com.au</a>			Project: P1002863	File: JD01V01	Revision: A



KEY

BH 105

BOREHOLE LOCATION

TP 105

TEST PIT LOCATION

SS 105

SURFACE SAMPLE LOCATION

SITE BOUNDARY

AREAS OF FILL  
(BOUNDRY APPROXIMATE)

PAGE BAR SCALE

0

30

60

90

120

150

UNITS - METRES

SCALE - 1:1500 @ A1 1:3000 @ A3

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Martens & Associates Pty Ltd		ABN 85 070 240 890	Environment   Water   Wastewater   Geotechnical   Civil   Management				
Drawn:	BM		PRELIMINARY OUTLINE OF SITE FILL		Drawing No./ID:		
Approved:	AN				1002863JD02V01		
Date:	15.10.12						
Scale @A3:	1:3000						
6/37 Leighton Place, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767 Email: <a href="mailto:mail@martens.com.au">mail@martens.com.au</a> Internet: <a href="http://www.martens.com.au">http://www.martens.com.au</a>			Project:	File:	Revision:		
			P1002863	JD01V01	A		

Attachment B – Historical Aerials (1961, 1970, 1984, 1994,  
2008)

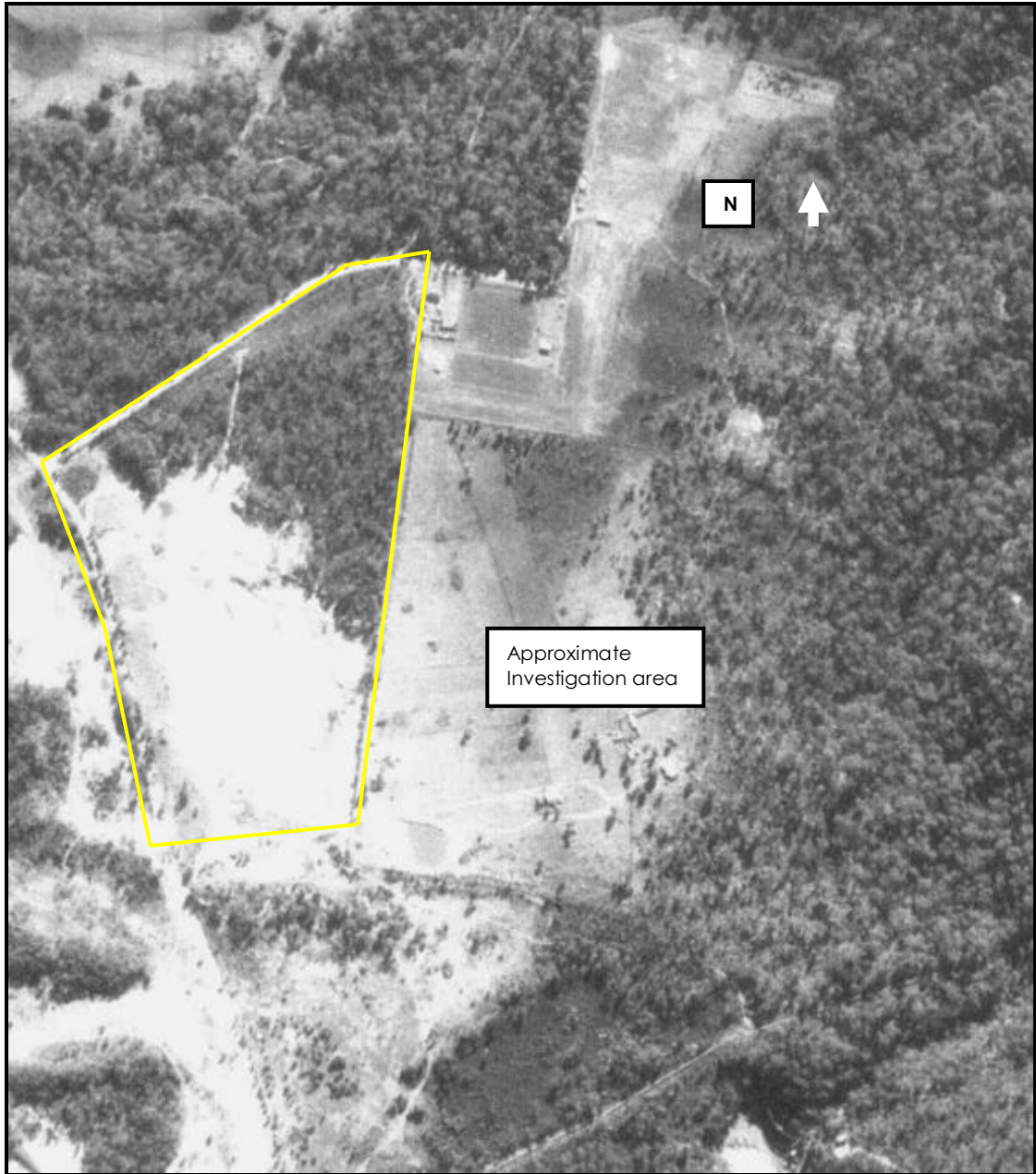


Martens & Associates Pty Ltd    ABN 85 070 240 890		Environment   Water   Wastewater   Geotechnical   Civil   Management	
Drawn:	BM	1961 Aerial Photo	Drawing No:
Approved:	AN		<b>FIGURE 1</b>
Date:	27.09.2012		
Scale:	NA		Job No: P0102863





<b>Martens &amp; Associates Pty Ltd</b> ABN 85 070 240 890		<b>Environment   Water   Wastewater   Geotechnical   Civil   Management</b>	
Drawn:	BM	<b>1970 Aerial Photo</b>	Drawing No:
Approved:	AN		<b>FIGURE 1</b>
Date:	27.09.2012		
Scale:	NA		Job No: P0102863



<b>Martens &amp; Associates Pty Ltd</b> ABN 85 070 240 890		<b>Environment   Water   Wastewater   Geotechnical   Civil   Management</b>	
Drawn:	BM	<b>1982 Aerial Photo</b>	Drawing No:
Approved:	AN		<b>FIGURE 1</b>
Date:	27.09.2012		
Scale:	NA		Job No: P0102863



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**Environment | Water | Wastewater | Geotechnical | Civil | Management**

Drawn:	BM
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Date:	27.09.2012
Scale:	NA

**1993 Aerial Photo**

Drawing No:
<b>FIGURE 1</b>
Job No: P0102863





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Drawn:	BM	2008 Aerial Photo	Drawing No:
Approved:	AN		<b>FIGURE 1</b>
Date:	27.09.2012		
Scale:	NA		Job No: P0102863





<b>Martens &amp; Associates Pty Ltd</b> ABN 85 070 240 890		<b>Environment   Water   Wastewater   Geotechnical   Civil   Management</b>	
Drawn:	BM	<b>2012 Aerial Photo</b>	Drawing No:
Approved:	AN		<b>FIGURE 1</b>
Date:	27.09.2012		
Scale:	NA		Job No: P0102863

- 10 Attachment C - Workcover license to keep goods on site results



Our Ref: D12/140754  
Your Ref: Gregory Lyell

WorkCover NSW  
92-100 Donnison Street, Gosford, NSW 2250  
Locked Bag 2906, Lisarow, NSW 2252  
T 02 4321 5000 F 02 4325 4145  
WorkCover Assistance Service 13 10 50  
DX 731 Sydney workcover.nsw.gov.au

21 September 2012

Attention: Gregory Lyell  
Martens and Associates  
6/37 Leighton Place  
Hornsby NSW 2077

Dear Mr Lyell,

**RE SITE: Lot 1 DP 1021332 George Evans Rd Mundamia NSW**

I refer to your site search request received by WorkCover NSW on 11 September 2012 requesting information on licences to keep dangerous goods for the above site.

A search of the Stored Chemical Information Database (SCID) and the microfiche records held by WorkCover NSW has not located any records pertaining to the above mentioned premises.

If you have any further queries please contact the Dangerous Goods Licensing Team on (02) 4321 5500.

Yours Sincerely


  
Brent Jones  
Senior Licensing Officer  
Dangerous Goods Team


RECEIVED  
25 SEP 2012  
BY: .....

## 11 Attachment D – Test pit/ Borehole Logs

CLIENT	Shoalhaven City Council				COMMENCED	19.09.12		COMPLETED	19.09.12		REF BH101						
PROJECT	Geotechnical and Contamination Assessment				LOGGED	BM/JF		CHECKED	JF		Sheet 1 of 1						
SITE	Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia				GEOLOGY	Sandstone		VEGETATION	Grass		PROJECT NO. P1002863						
EQUIPMENT		Truck mounted rig			EASTING	NA		RL SURFACE	NA								
EXCAVATION DIMENSIONS		Ø95mm X 5.5m depth			NORTHING	NA		ASPECT	North		SLOPE	<5%					
EXCAVATION DATA					MATERIAL DATA					SAMPLING & TESTING							
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA Soil type, texture, structure, mottling, colour, plasticity, rocks, oxidation, particle characteristics, organics, secondary and minor components, fill, contamination, odour.		CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)				
V	Nil	N	D	0.1			SM	TOP SOIL - SILTY SAND - Brown, with organics.			L	A	0.05	2863/101/0.05			
V	Nil	N	D	0.2								A	0.2	2863/101/0.2			
V	Nil	N	D	0.25								B	0.25	2863/101/ 0.25			
V	Nil	N	D	0.5			CL	CLAY - Red, with grey mottles, low plasticity.		St		A	0.5	2863/101/0.5			
V	Nil	N	D	0.7													
V	Nil	N	D	0.75								A	0.75	2863/101/0.75			
V	Nil	N	D	1.0			EW	EXTREMELY WEAK WEATHERED SANDSTONE - Clay like properties, with iron stone inclusions.				B	1.0	2863/101/ 1.0			
V	Nil	N	D	1.4													
V	Nil	N	D	1.5								B	1.5	2863/101/ 1.5			
V	Nil	N	D	2.0			W	WEAK SANDSTONE - Brown/red, coarse grained sand.									
V	Nil	N	D	2.4													
V	Nil	N	D	3.0			EW	EXTREMELY WEAK WEATHERED SANDSTONE - Light grey, very easy drilling.									
V	Nil	N	D	3.2													
V	Nil	N	D	3.8			S	STRONG SANDSTONE - Brown/red.									
				4.0				Borehole terminated at 3.8m on sandstone.									
				4.5													
EQUIPMENT / METHOD		SUPPORT		WATER		MOISTURE		PENETRATION		CONSISTENCY		DENSITY		SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION	
N Natural exposure		SH Shoring		N None observed		D Dry		L Low		VS Very Soft		VL Very Loose		A Auger sample		pp Pocket penetrometer	
S Spade		SC Shotcrete		X Not measured		M Moist		M Moderate		S Soft		L Loose		B Bulk sample		S Standard penetration test	
BH Backhoe bucket		RB Rock Bolts		Water level		W Wet		H High		F Firm		MD Medium Dense		U Undisturbed sample		VS Vane shear	
HA Hand auger		Nil No support		Water outflow		Wp Plastic limit		R Refusal		St Stiff		D Dense		D Disturbed sample		DCP Dynamic cone penetrometer	
A Auger				Water inflow		WL Liquid limit				VSt Very Stiff		VD Very Dense		M Moisture content		FD Field density	
CC Concrete Corer										H Hard				Ux Tube sample (x mm)		WS Water sample	
V V-Bit										F Friable				E Environmental sample			
TC Tungsten Carbide Bit																	
PT Push tube																	
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS																	
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CLIENT		Shoalhaven City Council			COMMENCED		19.09.12		COMPLETED		19.09.12		REF		BH107		
PROJECT		Geotechnical and Contamination Assessment			LOGGED		BM/JF		CHECKED		JF		Sheet 1 of 1				
SITE		Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia			GEOLOGY		Sandstone		VEGETATION		Grass		PROJECT NO. P1002863				
EQUIPMENT				Truck mounted rig			EASTING		NA		RL SURFACE		NA				
EXCAVATION DIMENSIONS				Ø95mm X 2.8m depth			NORTHING		NA		ASPECT		North		SLOPE <5%		
EXCAVATION DATA						MATERIAL DATA						SAMPLING & TESTING					
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA Soil type, texture, structure, mottling, colour, plasticity, rocks, oxidation, particle characteristics, organics, secondary and minor components, fill, contamination, odour.				CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)		
V	Nil	N	D	0.05		X X X		TOP SOIL - Brown, gravelly sand, sandstone gravels (5-30mm, 10%).						A	0.05	2863/107/ 0.05	
V	Nil	N	D				SC	CLAYEY SAND - Orange/yellow, moist, fine grained, minor gravels (5-10mm, 5%).						A	0.2	2863/107/ 0.2	
V	Nil	N	D	0.5													
V	Nil	N	D	1.0										B	1.0	2863/107/ 1.0	
V	Nil	N	D	2.0			MS	MEDIUM STRONG SANDSTONE - Red/brown.						B	2.0	2863/107/ 2.0	
V	Nil	N	D	2.3													
V	Nil	N	D	2.8			MS	MEDIUM STRONG SANDSTONE - Grey, with quartzite gravels.						B	2.5	2863/107/ 2.5	
				3.0				V-Bit refusal at 2.8m in medium strong sandstone.									
				4.0													
				4.5													
EQUIPMENT / METHOD		SUPPORT		WATER		MOISTURE		PENETRATION		CONSISTENCY		DENSITY		SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION	
N Natural exposure		SH Shoring		N None observed		D Dry		L Low		VS Very Soft		VL Very Loose		A Auger sample		pp Pocket penetrometer	
S Spade		SC Shotcrete		X Not measured		M Moist		M Moderate		S Soft		L Loose		B Bulk sample		S Standard penetration test	
BH Backhoe bucket		RB Rock Bolts		Water level		W Wet		H High		F Firm		MD Medium Dense		U Undisturbed sample		VS Vane shear	
HA Hand auger		Nil No support		Water outflow		Wp Plastic limit		R Refusal		St Stiff		D Dense		D Disturbed sample		DCP Dynamic cone penetrometer	
A Auger				Water inflow		WL Liquid limit				VSt Very Stiff		VD Very Dense		M Moisture content		FD Field density	
CC Concrete Corer										H Hard				Ux Tube sample (x mm)		WS Water sample	
V V-Bit										F Friable				E Environmental sample			
TC Tungsten Carbide Bit																	
PT Push tube																	
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS																	
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CLIENT		Shoalhaven City Council				COMMENCED		19.09.12		COMPLETED		19.09.12		REF		BH109	
PROJECT		Geotechnical and Contamination Assessment				LOGGED		BM/JF		CHECKED		JF		Sheet 1 of 1			
SITE		Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia				GEOLOGY		Sandstone		VEGETATION		Grass		PROJECT NO. P1002863			
EQUIPMENT		Truck mounted rig				EASTING		NA		RL SURFACE		NA					
EXCAVATION DIMENSIONS		Ø95mm X 0.9m depth				NORTHING		NA		ASPECT		North		SLOPE		<5%	
EXCAVATION DATA						MATERIAL DATA						SAMPLING & TESTING					
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA Soil type, texture, structure, mottling, colour, plasticity, rocks, oxidation, particle characteristics, organics, secondary and minor components, fill, contamination, odour.		CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)				
V	Nil	N	D	0.1			SM	TOP SOIL - SILTY SAND - Gravels (5-50mm, 10%).				A	0.05	2863/109/ 0.05			
V	Nil	N	D	0.4			SP	GRAVELLY SAND - Light brown, gravels (5-50mm, 10-20%).				A	0.2	2863/109/ 0.2			
V	Nil	N	D	0.9			MS	MEDIUM STRONG SANDSTONE - Light brown grading to dark brown with depth.				B	0.6	2863/109/ 0.6			
				1.0				V-Bit refusal at 0.9m on sandstone.						1.0			
				2.0										2.0			
				3.0										3.0			
				4.0										4.0			
				4.5										4.5			
EQUIPMENT / METHOD		SUPPORT		WATER		MOISTURE		PENETRATION		CONSISTENCY		DENSITY		SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION	
N Natural exposure		SH Shoring		N None observed		D Dry		L Low		VS Very Soft		VL Very Loose		A Auger sample		USCS	
S Spade		SC Shotcrete		X Not measured		M Moist		M Moderate		S Soft		L Loose		B Bulk sample		Agricultural	
BH Backhoe bucket		RB Rock Bolts		▽ Water level		W Wet		H High		F Firm		MD Medium Dense		U Undisturbed sample			
HA Hand auger		Nil No support		⚡ Water outflow		Wp Plastic limit		R Refusal		St Stiff		D Dense		D Disturbed sample			
A Auger				⚡ Water inflow		WI Liquid limit				VSt Very Stiff		VD Very Dense		M Moisture content			
CC Concrete Corer										H Hard				Ux Tube sample (x mm)			
V V-Bit										F Friable				E Environmental sample			
TC Tungsten Carbide Bit														FD Field density			
PT Push tube														WS Water sample			
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS																	
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CLIENT		Shoalhaven City Council			COMMENCED		19.09.12		COMPLETED		19.09.12		REF		BH110						
PROJECT		Geotechnical and Contamination Assessment			LOGGED		BM/JF		CHECKED		JF		Sheet 1 of 1								
SITE		Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia			GEOLOGY		Sandstone		VEGETATION		Grass		PROJECT NO. P1002863								
EQUIPMENT				Truck mounted rig			EASTING		NA		RL SURFACE		NA								
EXCAVATION DIMENSIONS				Ø95mm X 2.6m depth			NORTHING		NA		ASPECT		North		SLOPE <5%						
EXCAVATION DATA				MATERIAL DATA						SAMPLING & TESTING											
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA Soil type, texture, structure, mottling, colour, plasticity, rocks, oxidation, particle characteristics, organics, secondary and minor components, fill, contamination, odour.		CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)								
V	Nil	N	D	0.1			SM	TOP SOIL - SILTY SAND - Gravels (5-50mm, 10%).				A	0.05	2863/110/ 0.05							
												A	0.2	2863/110/ 0.2 CBR10 @ 0.2-0.4m							
V	Nil	N	D				SP	GRAVELLY SAND - Light brown, gravels (5-50mm, 10-20%).				B	0.75	2863/110/ 0.75							
				1.0																	
				1.6																	
V	Nil	N	D				MS	MEDIUM STRONG SANDSTONE - Red/dark brown, iron stone inclusions.				B	1.8	2863/110/ 1.8							
				2.0																	
				2.2																	
V	Nil	N	D				MS	MEDIUM STRONG SANDSTONE				B	2.4	2863/110/ 2.4							
				2.6																	
								V-Bit refusal at 2.6m on medium strong sandstone.													
				3.0																	
				4.0																	
				4.5																	
EQUIPMENT / METHOD				SUPPORT		WATER		MOISTURE		PENETRATION		CONSISTENCY		DENSITY		SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION			
N Natural exposure				SH Shoring		N None observed		D Dry		L Low		VS Very Soft		VL Very Loose		A Auger sample		pp Pocket penetrometer			
S Spade				SC Shotcrete		X Not measured		M Moist		M Moderate		S Soft		L Loose		B Bulk sample		S Standard penetration test			
BH Backhoe bucket				RB Rock Bolts		Water level		W Wet		H High		F Firm		MD Medium Dense		U Undisturbed sample		VS Vane shear			
HA Hand auger				Nil No support		Water outflow		Wp Plastic limit		R Refusal		St Stiff		D Dense		D Disturbed sample		DCP Dynamic cone penetrometer			
A Auger						Water inflow		WI Liquid limit				VSt Very Stiff		VD Very Dense		M Moisture content		FD Field density			
CC Concrete Corer												H Hard				Ux Tube sample (x mm)		WS Water sample			
V V-Bit												F Friable				E Environmental sample					
TC Tungsten Carbide Bit																					
PT Push tube																					
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS																					
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Quality Sheet No. 4







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CLIENT		Shoalhaven City Council				COMMENCED		19.09.12		COMPLETED		19.09.12		REF		BH115	
PROJECT		Geotechnical and Contamination Assessment				LOGGED		BM/JF		CHECKED		JF		Sheet 1 of 1			
SITE		Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia				GEOLOGY		Sandstone		VEGETATION		Grass		PROJECT NO. P1002863			
EQUIPMENT		Hand Auger				EASTING		NA		RL SURFACE		NA					
EXCAVATION DIMENSIONS		Ø95mm X 0.3m depth				NORTHING		NA		ASPECT		North		SLOPE		<5%	
EXCAVATION DATA						MATERIAL DATA						SAMPLING & TESTING					
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA Soil type, texture, structure, mottling, colour, plasticity, rocks, oxidation, particle characteristics, organics, secondary and minor components, fill, contamination, odour.		CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)				
HA	Nil	N	M	0.15			CL	SANDY CLAY - Light brown.				A	0.05	2863/115/ 0.05			
HA	Nil	N	M	0.3			W	WEAK, EXTREMELY WEATHERED SANDSTONE - Grey, clay like properties				A	0.2	2863/115/ 0.2			
								Borehole terminated at 0.3m on sandstone.									
				1.0										1.0			
				2.0										2.0			
				3.0										3.0			
				4.0										4.0			
				4.5										4.5			
EQUIPMENT / METHOD		SUPPORT		WATER		MOISTURE		PENETRATION		CONSISTENCY		DENSITY		SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION	
N Natural exposure		SH Shoring		N None observed		D Dry		L Low		VS Very Soft		VL Very Loose		A Auger sample		pp Pocket penetrometer	
S Spade		SC Shotcrete		X Not measured		M Moist		M Moderate		S Soft		L Loose		B Bulk sample		S Standard penetration test	
BH Backhoe bucket		RB Rock Bolts		▽ Water level		W Wet		H High		F Firm		MD Medium Dense		U Undisturbed sample		VS Vane shear	
HA Hand auger		Nil No support		△ Water outflow		Wp Plastic limit		R Refusal		St Stiff		D Dense		D Disturbed sample		DCP Dynamic cone	
A Auger				▽ Water inflow		WI Liquid limit				VSt Very Stiff		VD Very Dense		M Moisture content		penetrometer	
CC Concrete Corer										H Hard				Ux Tube sample (x mm)		FD Field density	
V V-Bit										F Friable				E Environmental sample		WS Water sample	
TC Tungsten Carbide Bit																	
PT Push tube																	
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS																	
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CLIENT		Shoalhaven City Council			COMMENCED		19.09.12		COMPLETED		19.09.12		REF		BH116		
PROJECT		Geotechnical and Contamination Assessment			LOGGED		BM/JF		CHECKED		JF		Sheet 1 of 1				
SITE		Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia			GEOLOGY		Sandstone		VEGETATION		Grass		PROJECT NO. P1002863				
EQUIPMENT		Hand Auger			EASTING		NA		RL SURFACE		NA						
EXCAVATION DIMENSIONS		Ø95mm X 0.5m depth			NORTHING		NA		ASPECT		North		SLOPE		<5%		
EXCAVATION DATA					MATERIAL DATA					SAMPLING & TESTING							
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA Soil type, texture, structure, mottling, colour, plasticity, rocks, oxidation, particle characteristics, organics, secondary and minor components, fill, contamination, odour.		CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)				
HA	Nil	N	D	0.2			XX	FILL - Gravelly clayey sand, brown, with blue metal gravels inclusion (5-10%).				A	0.05	2863/115/0.05			
												A	0.15	2863/115/0.15			
												A	0.2	2863/115/0.2			
HA	Nil	N	M	0.5			EW	EXTREMELY WEAK SANDSTONE - Orange and brown mottles.									
								Borehole terminated at 0.5m on sandstone.									
				1.0													
				2.0													
				3.0													
				4.0													
				4.5													
EQUIPMENT / METHOD		SUPPORT		WATER		MOISTURE		PENETRATION		CONSISTENCY		DENSITY		SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION	
N Natural exposure		SH Shoring		N None observed		D Dry		L Low		VS Very Soft		VL Very Loose		A Auger sample		pp Pocket penetrometer	
S Spade		SC Shotcrete		X Not measured		M Moist		M Moderate		S Soft		L Loose		B Bulk sample		S Standard penetration test	
BH Backhoe bucket		RB Rock Bolts				W Wet		H High		F Firm		MD Medium Dense		U Undisturbed sample		VS Vane shear	
HA Hand auger		Nil No support				Wp Plastic limit		R Refusal		St Stiff		D Dense		D Disturbed sample		DCP Dynamic cone penetrometer	
A Auger						WI Liquid limit				VSt Very Stiff		VD Very Dense		M Moisture content		FD Field density	
CC Concrete Corer										H Hard				Ux Tube sample (x mm)		WS Water sample	
V V-Bit										F Friable				E Environmental sample			
TC Tungsten Carbide Bit																	
PT Push tube																	
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS																	
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CLIENT		Shoalhaven City Council		COMMENCED	19.09.12	COMPLETED	19.09.12	REF		BH120				
PROJECT		Geotechnical and Contamination Assessment		LOGGED	BM/JF	CHECKED	JF	Sheet		1 of 1				
SITE		Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia		GEOLOGY	Sandstone	VEGETATION	Grass	PROJECT NO. P1002863						
EQUIPMENT		Hand Auger		EASTING	NA	RL SURFACE	NA							
EXCAVATION DIMENSIONS		Ø95mm X 1.6m depth		NORTHING	NA	ASPECT	North	SLOPE	<5%					
EXCAVATION DATA				MATERIAL DATA				SAMPLING & TESTING						
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA		CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)	
								Soil type, texture, structure, mottling, colour, plasticity, rocks, oxidation, particle characteristics, organics, secondary and minor components, fill, contamination, odour.						
HA	Nil	N	D	1.0			XX SM	FILL - SILTY SAND - Light brown, with minor sandstone gravels (5-10mm, 5%), building waste (brick, steel), glass and plastic.				A	0.05	2863/120/ 0.05
				1.6										A
				2.0				Borehole terminated at 0.3m on silty sand fill.						
				3.0										
				4.0										
				4.5										
EQUIPMENT / METHOD		SUPPORT	WATER	MOISTURE	PENETRATION	CONSISTENCY	DENSITY	SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION				
N Natural exposure		SH Shoring	N None observed	D Dry	L Low	VS Very Soft	VL Very Loose	A Auger sample		Y USCS				
S Spade		SC Shotcrete	X Not measured	M Moist	M Moderate	S Soft	L Loose	B Bulk sample		N Agricultural				
BH Backhoe bucket		RB Rock Bolts	▽ Water level	W Wet	H High	F Firm	MD Medium Dense	U Undisturbed sample						
HA Hand auger		Nil No support	⚡ Water outflow	Wp Plastic limit	R Refusal	St Stiff	D Dense	D Disturbed sample						
A Auger			⚡ Water inflow	WI Liquid limit		VSt Very Stiff	VD Very Dense	M Moisture content						
CC Concrete Corer						H Hard		Ux Tube sample (x mm)						
V V-Bit						F Friable		E Environmental sample						
TC Tungsten Carbide Bit								FD Field density						
PT Push tube								WS Water sample						
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS														
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CLIENT		Shoalhaven City Council				COMMENCED		19.09.12		COMPLETED		19.09.12		REF		BH121	
PROJECT		Geotechnical and Contamination Assessment				LOGGED		BM/JF		CHECKED		JF		Sheet 1 of 1			
SITE		Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia				GEOLOGY		Sandstone		VEGETATION		Grass		PROJECT NO. P1002863			
EQUIPMENT		Hand Auger				EASTING		NA		RL SURFACE		NA					
EXCAVATION DIMENSIONS		Ø95mm X 0.7m depth				NORTHING		NA		ASPECT		North		SLOPE		<5%	
EXCAVATION DATA						MATERIAL DATA						SAMPLING & TESTING					
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA Soil type, texture, structure, mottling, colour, plasticity, rocks, oxidation, particle characteristics, organics, secondary and minor components, fill, contamination, odour.		CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)				
HA	Nil	N	D	0.1			SP	SAND - Light brown, sandstone gravels (5-50mm, 10%).				A	0.05	2863/121/0.05			
HA	Nil	N	D	0.4			W	WEAK WEATHERED SANDSTONE - Light brown, gravels.				A	0.2	2863/121/0.2			
HA	Nil	N	D	0.6			MS	MEDIUM STRONG WEATHERED SANDSTONE - Light brown/grey.				A B	0.5 0.5	2863/121/0.5 2863/121/0.5			
HA	Nil	N	D	0.7			S	STRONG SANDSTONE - Light brown, quartzite gravels.									
				1.0				Refusal at 0.7m on strong sandstone.						1.0			
				2.0										2.0			
				3.0										3.0			
				4.0										4.0			
				4.5										4.5			
EQUIPMENT / METHOD		SUPPORT		WATER		MOISTURE		PENETRATION		CONSISTENCY		DENSITY		SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION	
N Natural exposure		SH Shoring		N None observed		D Dry		L Low		VS Very Soft		VL Very Loose		A Auger sample		pp Pocket penetrometer	
S Spade		SC Shotcrete		X Not measured		M Moist		M Moderate		S Soft		L Loose		B Bulk sample		S Standard penetration test	
BH Backhoe bucket		RB Rock Bolts		▽ Water level		W Wet		H High		F Firm		MD Medium Dense		U Undisturbed sample		VS Vane shear	
HA Hand auger		Nil No support		⚡ Water outflow		Wp Plastic limit		R Refusal		St Stiff		D Dense		D Disturbed sample		DCP Dynamic cone	
A Auger				⚡ Water inflow		WL Liquid limit				VSt Very Stiff		VD Very Dense		M Moisture content		penetrometer	
CC Concrete Corer										H Hard				Ux Tube sample (x mm)		FD Field density	
V V-Bit										F Friable				E Environmental sample		WS Water sample	
TC Tungsten Carbide Bit																	
PT Push tube																	
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS																	
						MARTENS & ASSOCIATES PTY LTD 6/37 Leighton Place Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767 mail@martens.com.au WEB: http://www.martens.com.au						<b>Engineering Log - Borehole</b>					

CLIENT		Shoalhaven City Council				COMMENCED		19.09.12		COMPLETED		19.09.12		REF		BH123	
PROJECT		Geotechnical and Contamination Assessment				LOGGED		BM/JF		CHECKED		JF		Sheet 1 of 1			
SITE		Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia				GEOLOGY		Sandstone		VEGETATION		Grass		PROJECT NO. P1002863			
EQUIPMENT		Hand Auger				EASTING		NA		RL SURFACE		NA					
EXCAVATION DIMENSIONS		Ø95mm X 0.45m depth				NORTHING		NA		ASPECT		North		SLOPE		<5%	
EXCAVATION DATA						MATERIAL DATA						SAMPLING & TESTING					
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA Soil type, texture, structure, mottling, colour, plasticity, rocks, oxidation, particle characteristics, organics, secondary and minor components, fill, contamination, odour.		CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)				
HA	Nil	N	D	0.15			SP	SAND - Light brown/grey, wet.				A	0.05	2863/123/ 0.05			
HA	Nil	N	D	0.45			EW	EXTREMELY WEAK, EXTREMELY WEATHERED SANDSTONE - Grey/orange, large grained sand.				A	0.2	2863/123/ 0.2			
								Borehole terminated at 0.45m on sandstone.				A	0.4	2863/123/ 0.4			
				1.0													
				2.0													
				3.0													
				4.0													
				4.5													
EQUIPMENT / METHOD		SUPPORT		WATER		MOISTURE		PENETRATION		CONSISTENCY		DENSITY		SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION	
N Natural exposure		SH Shoring		N None observed		D Dry		L Low		VS Very Soft		VL Very Loose		A Auger sample		pp Pocket penetrometer	
S Spade		SC Shotcrete		X Not measured		M Moist		M Moderate		S Soft		L Loose		B Bulk sample		S Standard penetration test	
BH Backhoe bucket		RB Rock Bolts		 Water level		W Wet		H High		F Firm		MD Medium Dense		U Undisturbed sample		VS Vane shear	
HA Hand auger		Nil No support		 Water outflow		Wp Plastic limit		R Refusal		St Stiff		D Dense		D Disturbed sample		DCP Dynamic cone penetrometer	
A Auger				 Water inflow		WI Liquid limit				VSt Very Stiff		VD Very Dense		M Moisture content		FD Field density	
CC Concrete Corer										H Hard				Ux Tube sample (x mm)		WS Water sample	
V V-Bit										F Friable				E Environmental sample			
TC Tungsten Carbide Bit																	
PT Push tube																	
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS																	
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CLIENT		Shoalhaven City Council				COMMENCED		19.09.12		COMPLETED		19.09.12		REF		BH129	
PROJECT		Geotechnical and Contamination Assessment				LOGGED		BM/JF		CHECKED		JF		Sheet 1 of 1			
SITE		Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia				GEOLOGY		Sandstone		VEGETATION		Grass		PROJECT NO. P1002863			
EQUIPMENT		Hand Auger				EASTING		NA		RL SURFACE		NA					
EXCAVATION DIMENSIONS		Ø70mm X 0.7m depth				NORTHING		NA		ASPECT		North		SLOPE		<5%	
EXCAVATION DATA						MATERIAL DATA						SAMPLING & TESTING					
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA Soil type, texture, structure, mottling, colour, plasticity, rocks, oxidation, particle characteristics, organics, secondary and minor components, fill, contamination, odour.		CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)				
HA	Nil	N	D	0.1			SM	TOP SOIL - SILTY SAND - Light brown, minor organics.				A	0.05	2863/129/ 0.05			
HA	Nil	N	D	0.4			SM	SILTY SAND - Brown, with minor organics.				A	0.25	2863/129/ 0.25			
HA	Nil	N	D	0.7			SP	GRAVELLY SAND - Gravels (5-50mm, 30/40%) - Light brown, moist.									
				1.0				Borehole terminated at 0.7m on gravelly sand.						1.0			
				2.0										2.0			
				3.0										3.0			
				4.0										4.0			
				4.5										4.5			
EQUIPMENT / METHOD		SUPPORT		WATER		MOISTURE		PENETRATION		CONSISTENCY		DENSITY		SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION	
N Natural exposure		SH Shoring		N None observed		D Dry		L Low		VS Very Soft		VL Very Loose		A Auger sample		pp Pocket penetrometer	
S Spade		SC Shotcrete		X Not measured		M Moist		M Moderate		S Soft		L Loose		B Bulk sample		S Standard penetration test	
BH Backhoe bucket		RB Rock Bolts		Water level		W Wet		H High		F Firm		MD Medium Dense		U Undisturbed sample		VS Vane shear	
HA Hand auger		Nil No support		Water outflow		Wp Plastic limit		R Refusal		St Stiff		D Dense		D Disturbed sample		DCP Dynamic cone penetrometer	
A Auger				Water inflow		WI Liquid limit				VSt Very Stiff		VD Very Dense		M Moisture content		FD Field density	
CC Concrete Corer										H Hard				Ux Tube sample (x mm)		WS Water sample	
V V-Bit										F Friable				E Environmental sample			
TC Tungsten Carbide Bit																	
PT Push tube																	
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS																	
<div><div><div>martens</div></div><div><div>MARTENS &amp; ASSOCIATES PTY LTD</div><div>6/37 Leighton Place</div><div>Hornsby, NSW 2077 Australia</div><div>Phone: (02) 9476 9999 Fax: (02) 9476 8767</div><div>mail@martens.com.au WEB: <a href="http://www.martens.com.au">http://www.martens.com.au</a></div></div></div> <div>Engineering Log - Borehole</div>																	

CLIENT		Shoalhaven City Council				COMMENCED		19.09.12		COMPLETED		19.09.12		REF		BH130	
PROJECT		Geotechnical and Contamination Assessment				LOGGED		BM/JF		CHECKED		JF		Sheet 1 of 1			
SITE		Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia				GEOLOGY		Sandstone		VEGETATION		Grass		PROJECT NO. P1002863			
EQUIPMENT		Hand Auger				EASTING		NA		RL SURFACE		NA					
EXCAVATION DIMENSIONS		Ø70mm X 0.6m depth				NORTHING		NA		ASPECT		North		SLOPE		<5%	
EXCAVATION DATA						MATERIAL DATA						SAMPLING & TESTING					
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA Soil type, texture, structure, mottling, colour, plasticity, rocks, oxidation, particle characteristics, organics, secondary and minor components, fill, contamination, odour.		CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)				
HA	Nil	N	D	0.05			SM	ORGANIC SILTY SAND - Brown, dry, rootlets.				E	0.05	2863/130/0.05			
HA	Nil	N	D				SC	CLAYEY SAND - Orange/yellow, moist, fine grained, minor gravels (5-10mm, 5%).				E	0.25	2863/130/0.25			
HA	Nil	N	D	0.5			SP	GRAVELLY SAND - Gravels (5-50mm, 30/40%) - Light brown, moist.									
				0.6				Borehole terminated at 0.6m (refusal) on gravely sand.									
				1.0										1.0			
				2.0										2.0			
				3.0										3.0			
				4.0										4.0			
				4.5										4.5			
EQUIPMENT / METHOD		SUPPORT		WATER		MOISTURE		PENETRATION		CONSISTENCY		DENSITY		SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION	
N Natural exposure		SH Shoring		N None observed		D Dry		L Low		VS Very Soft		VL Very Loose		A Auger sample		pp Pocket penetrometer	
S Spade		SC Shotcrete		X Not measured		M Moist		M Moderate		S Soft		L Loose		B Bulk sample		S Standard penetration test	
BH Backhoe bucket		RB Rock Bolts		Water level		W Wet		H High		F Firm		MD Medium Dense		U Undisturbed sample		VS Vane shear	
HA Hand auger		Nil No support		Water outflow		Wp Plastic limit		R Refusal		St Stiff		D Dense		D Disturbed sample		DCP Dynamic cone penetrometer	
A Auger				Water inflow		WI Liquid limit				VSt Very Stiff		VD Very Dense		M Moisture content		FD Field density	
CC Concrete Corer										H Hard				Ux Tube sample (x mm)		WS Water sample	
V V-Bit										F Friable				E Environmental sample			
TC Tungsten Carbide Bit																	
PT Push tube																	
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS																	
						MARTENS & ASSOCIATES PTY LTD 6/37 Leighton Place Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767 mail@martens.com.au WEB: http://www.martens.com.au						Engineering Log - Borehole					



CLIENT		Shoalhaven City Council				COMMENCED		19.09.12		COMPLETED		19.09.12		REF		BH132	
PROJECT		Geotechnical and Contamination Assessment				LOGGED		BM/JF		CHECKED		JF		Sheet 1 of 1			
SITE		Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia				GEOLOGY		Sandstone		VEGETATION		Grass		PROJECT NO. P1002863			
EQUIPMENT		Hand Auger				EASTING		NA		RL SURFACE		NA					
EXCAVATION DIMENSIONS		Ø70mm X 0.5m depth				NORTHING		NA		ASPECT		North		SLOPE		<5%	
EXCAVATION DATA						MATERIAL DATA						SAMPLING & TESTING					
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA Soil type, texture, structure, mottling, colour, plasticity, rocks, oxidation, particle characteristics, organics, secondary and minor components, fill, contamination, odour.		CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)				
HA	Nil	N	D	0.1			XX	FILL - Sand, with gravels (5-50mm, 30-40%), brown/orange.				A	0.05	2863/132/ 0.05			
HA	Nil	N	D	0.2			SC	CLAYEY SAND - Orange/yellow, moist, fine grained, minor gravels (5-10mm, 5%).				A	0.2	2863/132/ 0.2			
HA	Nil	N	D	0.5			SP	SAND, WITH GRAVELS AND CLAY- Orange/brown.									
				1.0				Borehole terminated at 0.5m (refusal) on sandy gravels.									
				2.0													
				3.0													
				4.0													
				4.5													
EQUIPMENT / METHOD		SUPPORT		WATER		MOISTURE		PENETRATION		CONSISTENCY		DENSITY		SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION	
N Natural exposure		SH Shoring		N None observed		D Dry		L Low		VS Very Soft		VL Very Loose		A Auger sample		pp Pocket penetrometer	
S Spade		SC Shotcrete		X Not measured		M Moist		M Moderate		S Soft		L Loose		B Bulk sample		S Standard penetration test	
BH Backhoe bucket		RB Rock Bolts		Water level		W Wet		H High		F Firm		MD Medium Dense		U Undisturbed sample		VS Vane shear	
HA Hand auger		Nil No support		Water outflow		Wp Plastic limit		R Refusal		St Stiff		D Dense		D Disturbed sample		DCP Dynamic cone	
A Auger				Water inflow		WI Liquid limit				VSt Very Stiff		VD Very Dense		M Moisture content		penetrometer	
CC Concrete Corer										H Hard				Ux Tube sample (x mm)		FD Field density	
V V-Bit										F Friable				E Environmental sample		WS Water sample	
TC Tungsten Carbide Bit																	
PT Push tube																	
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS																	
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CLIENT		Shoalhaven City Council				COMMENCED		19.09.12		COMPLETED		19.09.12		REF		BH133	
PROJECT		Geotechnical and Contamination Assessment				LOGGED		BM/JF		CHECKED		JF		Sheet 1 of 1			
SITE		Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia				GEOLOGY		Sandstone		VEGETATION		Grass		PROJECT NO. P1002863			
EQUIPMENT		Truck mounted rig				EASTING		NA		RL SURFACE		NA					
EXCAVATION DIMENSIONS		Ø95mm X 0.85m depth				NORTHING		NA		ASPECT		North		SLOPE		<5%	
EXCAVATION DATA						MATERIAL DATA						SAMPLING & TESTING					
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA Soil type, texture, structure, mottling, colour, plasticity, rocks, oxidation, particle characteristics, organics, secondary and minor components, fill, contamination, odour.		CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)				
V	Nil	N	D	0.05			SM	TOP SOIL - SILTY SAND - Dark brown, organics.				A	0.05	2863/133/0.05			
V	Nil	N	D				SP	GRAVELY SAND - Dark brown.				A	0.3	2863/133/0.3			
				0.4													
V	Nil	N	D				SP	GRAVELY SAND - Light brown, with quartzite gravel, grading to extremely weathered rock.				B	0.5	2863/133/0.5			
				0.6													
V	Nil	N	D				W	WEAK WEATHERED SANDSTONE.									
				0.85													
				1.0				V-Bit refusal at 0.85m on weak to medium strong sandstone.						1.0			
				2.0										2.0			
				3.0										3.0			
				4.0										4.0			
				4.5										4.5			
EQUIPMENT / METHOD		SUPPORT		WATER		MOISTURE		PENETRATION		CONSISTENCY		DENSITY		SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION	
N Natural exposure		SH Shoring		N None observed		D Dry		L Low		VS Very Soft		VL Very Loose		A Auger sample		pp Pocket penetrometer	
S Spade		SC Shotcrete		X Not measured		M Moist		M Moderate		S Soft		L Loose		B Bulk sample		S Standard penetration test	
BH Backhoe bucket		RB Rock Bolts		Water level		W Wet		H High		F Firm		MD Medium Dense		U Undisturbed sample		VS Vane shear	
HA Hand auger		Nil No support		Water outflow		Wp Plastic limit		R Refusal		St Stiff		D Dense		D Disturbed sample		DCP Dynamic cone penetrometer	
A Auger				Water inflow		WI Liquid limit				VSt Very Stiff		VD Very Dense		M Moisture content		FD Field density	
CC Concrete Corer										H Hard				Ux Tube sample (x mm)		WS Water sample	
V V-Bit										F Friable				E Environmental sample			
TC Tungsten Carbide Bit																	
PT Push tube																	
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS																	
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CLIENT		Shoalhaven City Council				COMMENCED		19.09.12		COMPLETED		19.09.12		REF		BH138	
PROJECT		Geotechnical and Contamination Assessment				LOGGED		BM/JF		CHECKED		JF		Sheet 1 of 1			
SITE		Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia				GEOLOGY		Sandstone		VEGETATION		Grass		PROJECT NO. P1002863			
EQUIPMENT		Truck mounted rig				EASTING		NA		RL SURFACE		NA					
EXCAVATION DIMENSIONS		Ø95mm X 1.6m depth				NORTHING		NA		ASPECT		North		SLOPE		<5%	
EXCAVATION DATA						MATERIAL DATA						SAMPLING & TESTING					
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA Soil type, texture, structure, mottling, colour, plasticity, rocks, oxidation, particle characteristics, organics, secondary and minor components, fill, contamination, odour.		CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)				
V	Nil	N	D	0.1			XX	FILL - Organics silt, with gravel, dry.				E	0.05	2863/138/ 0.05			
V	Nil	N	D	0.9			XX	FILL - Gravelly/clayey sand, angular gravels (5-20mm, 10-20%), moist.				E	0.5	2863/138/ 0.5			
V	Nil	N	D	1.0			EW	EXTREMELY WEAK SANDSTONE - Gravelly sand properties, coarse grained, rounded quartzite gravels.				E	1.0	2863/138/ 1.0			
				1.6				Borehole terminated at 1.6m (V-bit refusal) on weak sandstone.				B	1.4	2863/138/ 1.4			
				2.0													
				3.0													
				4.0													
				4.5													
EQUIPMENT / METHOD		SUPPORT		WATER		MOISTURE		PENETRATION		CONSISTENCY		DENSITY		SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION	
N Natural exposure		SH Shoring		N None observed		D Dry		L Low		VS Very Soft		VL Very Loose		A Auger sample		pp Pocket penetrometer	
S Spade		SC Shotcrete		X Not measured		M Moist		M Moderate		S Soft		L Loose		B Bulk sample		S Standard penetration test	
BH Backhoe bucket		RB Rock Bolts		▽ Water level		W Wet		H High		F Firm		MD Medium Dense		U Undisturbed sample		VS Vane shear	
HA Hand auger		Nil No support		⚡ Water outflow		Wp Plastic limit		R Refusal		St Stiff		D Dense		D Disturbed sample		DCP Dynamic cone	
A Auger				⚡ Water inflow		WI Liquid limit				VSt Very Stiff		VD Very Dense		M Moisture content		penetrometer	
CC Concrete Corer										H Hard				Ux Tube sample (x mm)		FD Field density	
V V-Bit										F Friable				E Environmental sample		WS Water sample	
TC Tungsten Carbide Bit																	
PT Push tube																	
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS																	
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CLIENT		Shoalhaven City Council		COMMENCED		19.09.12		COMPLETED		19.09.12		REF		TP102	
PROJECT		Geotechnical and Contamination Assessment		LOGGED		BM/JF		CHECKED		JF		Sheet 1 of 1			
SITE		Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia		GEOLOGY		Sandstone		VEGETATION		Grass		PROJECT NO. P1002863			
EQUIPMENT				Backhoe		EASTING		NA		RL SURFACE		NA			
EXCAVATION DIMENSIONS				3.0m X 1.0m X 1.9m		NORTHING		NA		ASPECT		North		SLOPE 5%	

EXCAVATION DATA					MATERIAL DATA				SAMPLING & TESTING				
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA <small>Soil type, texture, structure, mottling, colour, plasticity, rocks, oxidation, particle characteristics, organics, secondary and minor components, fill, contamination, odour.</small>	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)	
BH	Nil	N	D	0.3			XX	FILL - Organic clayey silt, brown, with sandstone cobbles and boulders, some asphalt, concrete and clay inclusions.			E	0.3	2863/102/ 0.3
				0.5					E	0.5	2863/102/ 0.5		
BH	Nil	N	D	1.0			XX	FILL - Mix of clayey sand, silty sand, clay, with building and demolishing waste (steel, PVC pipe, PE pipe, bricks, concrete), sandstone boulders, timber and other organics, tin, plastic bags, fibre cement sheeting.			E	1.5	2863/102/ 1.5 + DUP2
				1.9									
				2.0				Test pit terminated at 1.9m on medium strong sandstone.					2.0
				3.0									3.0
				4.0									4.0
				4.5									4.5

EQUIPMENT / METHOD		SUPPORT		WATER		MOISTURE		PENETRATION		CONSISTENCY		DENSITY		SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION	
N	Natural exposure	SH	Shoring	N	None observed	D	Dry	L	Low	VS	Very Soft	VL	Very Loose	A	Auger sample	pp	Pocket penetrometer
S	Spade	SC	Shotcrete	X	Not measured	M	Moist	M	Moderate	S	Soft	L	Loose	B	Bulk sample	S	Standard penetration test
BH	Backhoe bucket	RB	Rock Bolts	▽	Water level	W	Wet	H	High	F	Firm	MD	Medium Dense	U	Undisturbed sample	VS	Vane shear
HA	Hand auger	Nil	No support	△	Water outflow	Wp	Plastic limit	R	Refusal	St	Stiff	D	Dense	D	Disturbed sample	DCP	Dynamic cone penetrometer
A	Auger			▽	Water inflow	WI	Liquid limit			VSt	Very Stiff	VD	Very Dense	M	Moisture content	Ux	Tube sample (x mm)
CC	Concrete Corer									H	Hard			E	Environmental sample	FD	Field density
V	V-Bit									F	Friable					WS	Water sample
TC	Tungsten Carbide Bit																
PT	Push tube																







EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS

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**Engineering Log -  
Excavation**

CLIENT		Shoalhaven City Council		COMMENCED		19.09.12		COMPLETED		19.09.12		REF		TP103			
PROJECT		Geotechnical and Contamination Assessment		LOGGED		BM/JF		CHECKED		JF		Sheet 1 of 1					
SITE		Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia		GEOLOGY		Sandstone		VEGETATION		Grass		PROJECT NO. P1002863					
EQUIPMENT		Backhoe		EASTING		NA		RL SURFACE		NA							
EXCAVATION DIMENSIONS		3.0m X 1.0m X 2.2m		NORTHING		NA		ASPECT		North		SLOPE		5-10%			
EXCAVATION DATA				MATERIAL DATA						SAMPLING & TESTING							
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA Soil type, texture, structure, mottling, colour, plasticity, rocks, oxidation, particle characteristics, organics, secondary and minor components, fill, contamination, odour.		CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)				
BH	Nil	N	D				XX	FILL - CLAY/SILTY CLAY LAYERS - Orange/brown, moist, soft to firm, gravels and cobble inclusions (10-20%).				E	0.25	2863/103/ 0.25			
				1.0										CBR @ 1.0m			
BH	Nil	N	D				XX	FILL - Mix of clayey sand, silty sand, clay, with building and demolishing waste (steel, PVC pipe, PE pipe, bricks, concrete), sandstone boulders, timber and other organics, tin, plastic bags, fibre cement sheeting.				M	1.1	2863/103/ ASB1 (fibre cement sheeting)			
				2.0								E	1.2	2863/103/ 1.2			
				2.2													
								Test pit terminated at 2.2m (bucket refusal) on strong sandstone.									
				3.0													
				4.0													
				4.5													
EQUIPMENT / METHOD		SUPPORT		WATER		MOISTURE		PENETRATION		CONSISTENCY		DENSITY		SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION	
N Natural exposure		SH Shoring		N None observed		D Dry		L Low		VS Very Soft		VL Very Loose		A Auger sample		pp Pocket penetrometer	
S Spade		SC Shotcrete		X Not measured		M Moist		M Moderate		S Soft		L Loose		B Bulk sample		S Standard penetration test	
BH Backhoe bucket		RB Rock Bolts		Water level		W Wet		H High		F Firm		MD Medium Dense		U Undisturbed sample		VS Vane shear	
HA Hand auger		Nil No support		Water outflow		Wp Plastic limit		R Refusal		St Stiff		D Dense		D Disturbed sample		DCP Dynamic cone penetrometer	
A Auger				Water inflow		WL Liquid limit				VSt Very Stiff		VD Very Dense		M Moisture content		FD Field density	
CC Concrete Corer										H Hard				Ux Tube sample (x mm)		WS Water sample	
V V-Bit										F Friable				E Environmental sample			
TC Tungsten Carbide Bit																	
PT Push tube																	
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS																	
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		Engineering Log - Excavation															


CLIENT		Shoalhaven City Council		COMMENCED		19.09.12		COMPLETED		19.09.12		REF		TP104	
PROJECT		Geotechnical and Contamination Assessment		LOGGED		BM/JF		CHECKED		JF		Sheet 1 of 1			
SITE		Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia		GEOLOGY		Sandstone		VEGETATION		Grass		PROJECT NO. P1002863			
EQUIPMENT		Backhoe		EASTING		NA		RL SURFACE		NA					
EXCAVATION DIMENSIONS		3.0m X 1.0m X 1.0m		NORTHING		NA		ASPECT		North		SLOPE		5-10%	
EXCAVATION DATA				MATERIAL DATA				SAMPLING & TESTING							
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA Soil type, texture, structure, mottling, colour, plasticity, rocks, oxidation, particle characteristics, organics, secondary and minor components, fill, contamination, odour.		CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)		
BH	Nil	N	D				XX	FILL - Silty clay, some sand and gravels, sandstone cobbles and boulders, organics, treated pine, bricks, steel and fibre cement sheeting inclusions.				M	0.1	2863/103/ ASB2	
												M	0.2	2863/103/ ASB3	
												E	0.3	2863/103/ 0.3	
												E	0.6	2863/103/ 0.6	
				0.7											
BH	Nil	N	D				SP	SAND - Brown grading orange, moist, with gravels (5-20mm, 20%).				E	0.8	2863/103/ 0.8	
				0.95								B	0.8	2863/103/ 0.8	
BH	Nil	N	D	1.0			EW	EXTREMELY WEAK SANDSTONE - Light grey, moist, clayey sand texture.							
Test pit terminated at 1.0m (bucket refusal) on medium strong sandstone.															
				2.0											
				3.0											
				4.0											
				4.5											
EQUIPMENT / METHOD		SUPPORT		WATER		MOISTURE		PENETRATION		CONSISTENCY		DENSITY		SAMPLING & TESTING	
N Natural exposure		SH Shoring		N None observed		D Dry		L Low		VS Very Soft		VL Very Loose		A Auger sample	
S Spade		SC Shotcrete		X Not measured		M Moist		M Moderate		S Soft		L Loose		B Bulk sample	
BH Backhoe bucket		RB Rock Bolts		 Water level		W Wet		H High		F Firm		MD Medium Dense		U Undisturbed sample	
HA Hand auger		Nil No support		 Water outflow		Wp Plastic limit		R Refusal		St Stiff		D Dense		D Disturbed sample	
A Auger				 Water inflow		WI Liquid limit				VSt Very Stiff		VD Very Dense		M Moisture content	
CC Concrete Corer										H Hard				Ux Tube sample (x mm)	
V V-Bit										F Friable				FD Field density	
TC Tungsten Carbide Bit														E Environmental sample	
PT Push tube														WS Water sample	
CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION															
Y USCS															
N Agricultural															
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS															
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CLIENT	Shoalhaven City Council			COMMENCED	19.09.12	COMPLETED	19.09.12	REF TP105					
PROJECT	Geotechnical and Contamination Assessment			LOGGED	BM/JF	CHECKED	JF	Sheet 1 of 1					
SITE	Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia			GEOLOGY	Sandstone	VEGETATION	Grass	PROJECT NO. P1002863					
EQUIPMENT	Backhoe			EASTING	NA	RL SURFACE	NA						
EXCAVATION DIMENSIONS	3.0m X 1.0m X 1.6m			NORTHING	NA	ASPECT	North	SLOPE	5%				
EXCAVATION DATA				MATERIAL DATA				SAMPLING & TESTING					
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA <small>Soil type, texture, structure, mottling, colour, plasticity, rocks, oxidation, particle characteristics, organics, secondary and minor components, fill, contamination, odour.</small>	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)	
BH	Nil	N	M	0.5			XX	FILL - Organic clayey silt, gravels, cobbles and some plastic.			E	0.2	2863/105/ 0.2
BH	Nil	N	M	1.0			SC	CLAYEY SAND - Grey/red mottles, moist, some sandstone gravels and cobbles.			E	0.6	2863/105/ 0.6
				1.6				Grades to extremely weak sandstone.			B	1.2	2863/105/ 1.2
				2.0				Test pit terminated at 1.6m (bucket refusal) on medium strong sandstone.					
				3.0									
				4.0									
				4.5									
EQUIPMENT / METHOD				SUPPORT	WATER	MOISTURE	PENETRATION	CONSISTENCY	DENSITY	SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION	
N Natural exposure				SH Shoring	N None observed	D Dry	L Low	VS Very Soft	VL Very Loose	A Auger sample	pp Pocket penetrometer	Y USCS	
S Spade				SC Shotcrete	X Not measured	M Moist	M Moderate	S Soft	L Loose	B Bulk sample	S Standard penetration test	N Agricultural	
BH Backhoe bucket				RB Rock Bolts	Water level	W Wet	H High	F Firm	MD Medium Dense	U Undisturbed sample	VS Vane shear		
HA Hand auger				Nil No support		Wp Plastic limit	R Refusal	St Stiff	D Dense	D Disturbed sample	DCP Dynamic cone penetrometer		
A Auger						WI Liquid limit		VSt Very Stiff	VD Very Dense	M Moisture content	FD Field density		
CC Concrete Corer								H Hard		Ux Tube sample (x mm)	WS Water sample		
V V-Bit								F Friable		E Environmental sample			
TC Tungsten Carbide Bit													
PT Push tube													
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS													
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CLIENT		Shoalhaven City Council		COMMENCED		19.09.12		COMPLETED		19.09.12		REF		TP108			
PROJECT		Geotechnical and Contamination Assessment		LOGGED		BM/JF		CHECKED		JF		Sheet 1 of 1					
SITE		Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia		GEOLOGY		Sandstone		VEGETATION		Grass		PROJECT NO. P1002863					
EQUIPMENT		Backhoe		EASTING		NA		RL SURFACE		NA							
EXCAVATION DIMENSIONS		3.0m X 1.0m X 2.3m		NORTHING		NA		ASPECT		North		SLOPE		5-10%			
EXCAVATION DATA				MATERIAL DATA						SAMPLING & TESTING							
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA Soil type, texture, structure, mottling, colour, plasticity, rocks, oxidation, particle characteristics, organics, secondary and minor components, fill, contamination, odour.		CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)				
BH	Nil	N	M	1.5			XX	FILL - Organic silty clay, brown, some sand and gravels, pieces of concrete (100-500mm), plastic and steel.				E	0.25	2863/108/ 0.25			
				1.0								E	1.0	2863/108/ 1.0			
				2.0								E	2.0	2863/108/ 2.0			
				2.3				Test pit terminated at 2.3m due to groundwater and test pit collapse.									
				3.0													
				4.0													
				4.5													
EQUIPMENT / METHOD		SUPPORT		WATER		MOISTURE		PENETRATION		CONSISTENCY		DENSITY		SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION	
N Natural exposure		SH Shoring		N None observed		D Dry		L Low		VS Very Soft		VL Very Loose		A Auger sample		pp Pocket penetrometer	
S Spade		SC Shotcrete		X Not measured		M Moist		M Moderate		S Soft		L Loose		B Bulk sample		S Standard penetration test	
BH Backhoe bucket		RB Rock Bolts				W Wet		H High		F Firm		MD Medium Dense		U Undisturbed sample		VS Vane shear	
HA Hand auger		Nil No support				Wp Plastic limit		R Refusal		St Stiff		D Dense		D Disturbed sample		DCP Dynamic cone penetrometer	
A Auger						Wl Liquid limit				VSt Very Stiff		VD Very Dense		M Moisture content		FD Field density	
CC Concrete Corer										H Hard				Ux Tube sample (x mm)		WS Water sample	
V V-Bit										F Friable				E Environmental sample			
TC Tungsten Carbide Bit																	
PT Push tube																	
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS																	
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CLIENT		Shoalhaven City Council		COMMENCED	19.09.12	COMPLETED	19.09.12	REF TP111					
PROJECT		Geotechnical and Contamination Assessment		LOGGED	BM/JF	CHECKED	JF	Sheet 1 of 1					
SITE		Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia		GEOLOGY	Sandstone	VEGETATION	Grass	PROJECT NO. P1002863					
EQUIPMENT		Backhoe		EASTING	NA	RL SURFACE	NA						
EXCAVATION DIMENSIONS		3.0m X 1.0m X 0.8m		NORTHING	NA	ASPECT	North	SLOPE	5-10%				
EXCAVATION DATA				MATERIAL DATA				SAMPLING & TESTING					
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)	
BH	Nil	N	M				XX	FILL - Silty sand, orange brown, dry, minor organics, some sandstone cobbles and boulders.			E	0.25	2863/111/ 0.25
				0.8				Test pit terminated at 0.8m (bucket refusal) on medium strong sandstone.					
				1.0									
				2.0									
				3.0									
				4.0									
				4.5									
EQUIPMENT / METHOD		SUPPORT	WATER	MOISTURE	PENETRATION	CONSISTENCY	DENSITY	SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION			
N Natural exposure		SH Shoring	N None observed	D Dry	L Low	VS Very Soft	VL Very Loose	A Auger sample		pp Pocket penetrometer		Y USCS	
S Spade		SC Shotcrete	X Not measured	M Moist	M Moderate	S Soft	L Loose	B Bulk sample		S Standard penetration test		N Agricultural	
BH Backhoe bucket		RB Rock Bolts	Water level	W Wet	H High	F Firm	MD Medium Dense	U Undisturbed sample		VS Vane shear			
HA Hand auger		Nil No support	Water outflow	Wp Plastic limit	R Refusal	St Stiff	D Dense	D Disturbed sample		DCP Dynamic cone penetrometer			
A Auger			Water inflow	WI Liquid limit		VSt Very Stiff	VD Very Dense	M Moisture content		FD Field density			
CC Concrete Corer						H Hard		Ux Tube sample (x mm)		WS Water sample			
V V-Bit						F Friable		E Environmental sample					
TC Tungsten Carbide Bit													
PT Push tube													
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS													
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CLIENT		Shoalhaven City Council		COMMENCED	19.09.12	COMPLETED	19.09.12	REF TP112					
PROJECT		Geotechnical and Contamination Assessment		LOGGED	BM/JF	CHECKED	JF	Sheet 1 of 1					
SITE		Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia		GEOLOGY	Sandstone	VEGETATION	Grass	PROJECT NO. P1002863					
EQUIPMENT		Backhoe		EASTING	NA	RL SURFACE	NA						
EXCAVATION DIMENSIONS		3.0m X 1.0m X 0.8m		NORTHING	NA	ASPECT	North	SLOPE	5-10%				
EXCAVATION DATA				MATERIAL DATA				SAMPLING & TESTING					
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)	
BH	Nil	N	M				XX	FILL - Silty clay/sandy clay, dry, minor builders rubble (bricks PVC pipe, concrete), some plastic and glass bottles.			E	0.5	2863/112/ 0.5
				0.8				Test pit terminated at 0.8m (bucket refusal) on medium strong sandstone.					
				1.0									
				2.0									
				3.0									
				4.0									
				4.5									
EQUIPMENT / METHOD		SUPPORT	WATER	MOISTURE	PENETRATION	CONSISTENCY	DENSITY	SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION			
N Natural exposure		SH Shoring	N None observed	D Dry	L Low	VS Very Soft	VL Very Loose	A Auger sample		pp Pocket penetrometer		Y USCS	
S Spade		SC Shotcrete	X Not measured	M Moist	M Moderate	S Soft	L Loose	B Bulk sample		S Standard penetration test		N Agricultural	
BH Backhoe bucket		RB Rock Bolts	Water level	W Wet	H High	F Firm	MD Medium Dense	U Undisturbed sample		VS Vane shear			
HA Hand auger		Nil No support	Water outflow	Wp Plastic limit	R Refusal	St Stiff	D Dense	D Disturbed sample		DCP Dynamic cone penetrometer			
A Auger			Water inflow	WI Liquid limit		VSt Very Stiff	VD Very Dense	M Moisture content		FD Field density			
CC Concrete Corer						H Hard		Ux Tube sample (x mm)		WS Water sample			
V V-Bit						F Friable		E Environmental sample					
TC Tungsten Carbide Bit													
PT Push tube													
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS													
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CLIENT		Shoalhaven City Council		COMMENCED	19.09.12	COMPLETED	19.09.12	REF TP113					
PROJECT		Geotechnical and Contamination Assessment		LOGGED	BM/JF	CHECKED	JF	Sheet 1 of 1					
SITE		Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia		GEOLOGY	Sandstone	VEGETATION	Grass	PROJECT NO. P1002863					
EQUIPMENT		Backhoe		EASTING	NA	RL SURFACE	NA						
EXCAVATION DIMENSIONS		3.0m X 1.0m X 0.9m		NORTHING	NA	ASPECT	North	SLOPE	5-10%				
EXCAVATION DATA				MATERIAL DATA				SAMPLING & TESTING					
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)	
BH	Nil	N	M				XX	FILL - Silty clay/clayey sand, brown, dry, minor builders rubble (bricks PVC pipe, concrete), some plastic.			E	0.4	2863/112/ 0.4
				0.9				Test pit terminated at 0.9m (bucket refusal) on medium strong sandstone.					
				1.0									
				2.0									
				3.0									
				4.0									
				4.5									
EQUIPMENT / METHOD		SUPPORT	WATER	MOISTURE	PENETRATION	CONSISTENCY	DENSITY	SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION			
N Natural exposure		SH Shoring	N None observed	D Dry	L Low	VS Very Soft	VL Very Loose	A Auger sample		pp Pocket penetrometer		Y USCS	
S Spade		SC Shotcrete	X Not measured	M Moist	M Moderate	S Soft	L Loose	B Bulk sample		S Standard penetration test		N Agricultural	
BH Backhoe bucket		RB Rock Bolts	Water level	W Wet	H High	F Firm	MD Medium Dense	U Undisturbed sample		VS Vane shear			
HA Hand auger		Nil No support	Water outflow	Wp Plastic limit	R Refusal	St Stiff	D Dense	D Disturbed sample		DCP Dynamic cone penetrometer			
A Auger			Water inflow	WI Liquid limit		VSt Very Stiff	VD Very Dense	M Moisture content		FD Field density			
CC Concrete Corer						H Hard		Ux Tube sample (x mm)		WS Water sample			
V V-Bit						F Friable		E Environmental sample					
TC Tungsten Carbide Bit													
PT Push tube													
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS													
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CLIENT		Shoalhaven City Council				COMMENCED		19.09.12		COMPLETED		19.09.12		REF		TP117	
PROJECT		Geotechnical and Contamination Assessment				LOGGED		BM/JF		CHECKED		JF		Sheet 1 of 1			
SITE		Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia				GEOLOGY		Sandstone		VEGETATION		Grass		PROJECT NO. P1002863			
EQUIPMENT		Backhoe				EASTING		NA		RL SURFACE		NA					
EXCAVATION DIMENSIONS		3.0m X 1.0m X 2.3m				NORTHING		NA		ASPECT		North		SLOPE		5-10%	
EXCAVATION DATA						MATERIAL DATA						SAMPLING & TESTING					
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA Soil type, texture, structure, mottling, colour, plasticity, rocks, oxidation, particle characteristics, organics, secondary and minor components, fill, contamination, odour.		CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)				
BH	Nil	N	D	0.1			SM	ORGANIC SILTY SAND - Brown, dry, rootlets.				E	0.05	2863/117/ 0.05			
BH	Nil	N	D				SC	CLAYEY SAND - Orange/yellow, moist, fine grained, minor gravels (5-10mm, 5%).				B	0.2-0.5	2863/117/ 0.2-0.5			
				0.5								E	0.3	CBR @ 0.2-0.5m 2863/117/ 0.3			
												B	0.6	2863/117/ 0.6			
				1.0								E	1.0	2863/117/ 1.0			
BH	Nil	N	D				CL	SANDY CLAY - Orange/grey/red mottles, moist.				B	1.0	2863/117/ 1.0			
				2.0				Grades to									
BH	Nil	N	D				EW	EXTREMELY WEAK SANDSTONE - Grey, with ferruginised gravels.									
				2.3				Test pit terminated at 2.3m (bucket refusal) on medium strong sandstone.									
				3.0													
				4.0													
				4.5													
EQUIPMENT / METHOD		SUPPORT		WATER		MOISTURE		PENETRATION		CONSISTENCY		DENSITY		SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION	
N Natural exposure		SH Shoring		N None observed		D Dry		L Low		VS Very Soft		VL Very Loose		A Auger sample		pp Pocket penetrometer	
S Spade		SC Shotcrete		X Not measured		M Moist		M Moderate		S Soft		L Loose		B Bulk sample		S Standard penetration test	
BH Backhoe bucket		RB Rock Bolts		Water level		W Wet		H High		F Firm		MD Medium Dense		U Undisturbed sample		VS Vane shear	
HA Hand auger		Nil No support		Water outflow		Wp Plastic limit		R Refusal		St Stiff		D Dense		D Disturbed sample		DCP Dynamic cone penetrometer	
A Auger				Water inflow		WL Liquid limit				VSt Very Stiff		VD Very Dense		M Moisture content		FD Field density	
CC Concrete Corer										H Hard				Ux Tube sample (x mm)		WS Water sample	
V V-Bit										F Friable				E Environmental sample			
TC Tungsten Carbide Bit																	
PT Push tube																	
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS																	
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CLIENT		Shoalhaven City Council			COMMENCED	19.09.12		COMPLETED	19.09.12		REF TP124		
PROJECT		Geotechnical and Contamination Assessment			LOGGED	BM/JF		CHECKED	JF		Sheet 1 of 1		
SITE		Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia			GEOLOGY	Sandstone		VEGETATION	Grass		PROJECT NO. P1002863		
EQUIPMENT		Spade			EASTING	NA		RL SURFACE	NA				
EXCAVATION DIMENSIONS		3.0m X 1.0m X 0.8m			NORTHING	NA		ASPECT	North		SLOPE	5-10%	
EXCAVATION DATA				MATERIAL DATA					SAMPLING & TESTING				
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA Soil type, texture, structure, mottling, colour, plasticity, rocks, oxidation, particle characteristics, organics, secondary and minor components, fill, contamination, odour.	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)	
S	Nil	N	D	0.25			SC	CLAYEY SAND - Orange/yellow, moist, fine grained, minor gravels (5-10mm, 5%).			E	0.05	2863/124/ 0.05
S	Nil	N	D	0.8			EW	EXTREMELY WEATHERED SANDSTONE			E	0.3	2863/124/ 0.3
				1.0				Test pit terminated at 0.8m on medium strong sandstone.					
				2.0									
				3.0									
				4.0									
				4.5									
EQUIPMENT / METHOD		SUPPORT	WATER	MOISTURE	PENETRATION	CONSISTENCY	DENSITY	SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION			
N Natural exposure		SH Shoring	N None observed	D Dry	L Low	VS Very Soft	VL Very Loose	A Auger sample		pp Pocket penetrometer			
S Spade		SC Shotcrete	X Not measured	M Moist	M Moderate	S Soft	L Loose	B Bulk sample		S Standard penetration test			
BH Backhoe bucket		RB Rock Bolts	▽ Water level	W Wet	H High	F Firm	MD Medium Dense	U Undisturbed sample		VS Vane shear			
HA Hand auger		Nil No support	△ Water outflow	Wp Plastic limit	R Refusal	St Stiff	D Dense	D Disturbed sample		DCP Dynamic cone penetrometer			
A Auger			▽ Water inflow	WI Liquid limit		VSt Very Stiff	VD Very Dense	M Moisture content		FD Field density			
CC Concrete Corer						H Hard		Ux Tube sample (x mm)		WS Water sample			
V V-Bit						F Friable		E Environmental sample					
TC Tungsten Carbide Bit													
PT Push tube													
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS													
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CLIENT		Shoalhaven City Council			COMMENCED		19.09.12		COMPLETED		19.09.12		REF		TP124		
PROJECT		Geotechnical and Contamination Assessment			LOGGED		BM/JF		CHECKED		JF		Sheet 1 of 1				
SITE		Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia			GEOLOGY		Sandstone		VEGETATION		Grass		PROJECT NO. P1002863				
EQUIPMENT				Spade			EASTING		NA		RL SURFACE		NA				
EXCAVATION DIMENSIONS				3.0m X 1.0m X 0.8m			NORTHING		NA		ASPECT		North		SLOPE 5-10%		
EXCAVATION DATA						MATERIAL DATA						SAMPLING & TESTING					
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA Soil type, texture, structure, mottling, colour, plasticity, rocks, oxidation, particle characteristics, organics, secondary and minor components, fill, contamination, odour.		CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)				
S	Nil	N	D	0.25			SC	CLAYEY SAND - Orange/yellow, moist, fine grained, minor gravels (5-10mm, 5%).				E	0.05	2863/124/ 0.05			
S	Nil	N	D	0.8			EW	EXTREMELY WEATHERED SANDSTONE				E	0.3	2863/124/ 0.3			
				1.0				Test pit terminated at 0.8m on medium strong sandstone.									
				2.0													
				3.0													
				4.0													
				4.5													
EQUIPMENT / METHOD		SUPPORT		WATER		MOISTURE		PENETRATION		CONSISTENCY		DENSITY		SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION	
N Natural exposure		SH Shoring		N None observed		D Dry		L Low		VS Very Soft		VL Very Loose		A Auger sample		pp Pocket penetrometer	
S Spade		SC Shotcrete		X Not measured		M Moist		M Moderate		S Soft		L Loose		B Bulk sample		S Standard penetration test	
BH Backhoe bucket		RB Rock Bolts		Water level		W Wet		H High		F Firm		MD Medium Dense		U Undisturbed sample		VS Vane shear	
HA Hand auger		Nil No support		Water outflow		Wp Plastic limit		R Refusal		St Stiff		D Dense		D Disturbed sample		DCP Dynamic cone penetrometer	
A Auger				Water inflow		WI Liquid limit				VSt Very Stiff		VD Very Dense		M Moisture content		FD Field density	
CC Concrete Corer										H Hard				Ux Tube sample (x mm)		WS Water sample	
V V-Bit										F Friable				E Environmental sample			
TC Tungsten Carbide Bit																	
PT Push tube																	
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS																	
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CLIENT		Shoalhaven City Council				COMMENCED		19.09.12		COMPLETED		19.09.12		REF		TP125	
PROJECT		Geotechnical and Contamination Assessment				LOGGED		BM/JF		CHECKED		JF		Sheet 1 of 1			
SITE		Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia				GEOLOGY		Sandstone		VEGETATION		Grass		PROJECT NO. P1002863			
EQUIPMENT		Spade				EASTING		NA		RL SURFACE		NA					
EXCAVATION DIMENSIONS		3.0m X 1.0m X 0.6m				NORTHING		NA		ASPECT		North		SLOPE		5-10%	
EXCAVATION DATA						MATERIAL DATA						SAMPLING & TESTING					
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA Soil type, texture, structure, mottling, colour, plasticity, rocks, oxidation, particle characteristics, organics, secondary and minor components, fill, contamination, odour.		CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)				
S	Nil	N	D	0.05			SM	ORGANIC SILTY SAND - Brown, dry, rootlets.				A	0.05	2863/125/ 0.05			
S	Nil	N	D				SC	CLAYEY SAND - Orange/yellow, moist, fine grained, minor gravels (5-10mm, 5%).				A	0.3	2863/125/ 0.3 + DUP3 CBR 125 0.1-0.4			
S	Nil	N	D	0.4													
S	Nil	N	D	0.6			SP	GRAVELLY SAND - Gravels (5-50mm, 30/40%) - Light brown, moist.									
				1.0				Test pit terminated at 0.6m on gravelly sand.									
				2.0													
				3.0													
				4.0													
				4.5													
EQUIPMENT / METHOD		SUPPORT		WATER		MOISTURE		PENETRATION		CONSISTENCY		DENSITY		SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION	
N Natural exposure		SH Shoring		N None observed		D Dry		L Low		VS Very Soft		VL Very Loose		A Auger sample		pp Pocket penetrometer	
S Spade		SC Shotcrete		X Not measured		M Moist		M Moderate		S Soft		L Loose		B Bulk sample		S Standard penetration test	
BH Backhoe bucket		RB Rock Bolts		Water level		W Wet		H High		F Firm		MD Medium Dense		U Undisturbed sample		VS Vane shear	
HA Hand auger		Nil No support		Water outflow		Wp Plastic limit		R Refusal		St Stiff		D Dense		D Disturbed sample		DCP Dynamic cone penetrometer	
A Auger				Water inflow		WI Liquid limit				VSt Very Stiff		VD Very Dense		M Moisture content		FD Field density	
CC Concrete Corer										H Hard				Ux Tube sample (x mm)		WS Water sample	
V V-Bit										F Friable				E Environmental sample			
TC Tungsten Carbide Bit																	
PT Push tube																	
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS																	
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CLIENT		Shoalhaven City Council				COMMENCED		19.09.12		COMPLETED		19.09.12		REF		TP125	
PROJECT		Geotechnical and Contamination Assessment				LOGGED		BM/JF		CHECKED		JF		Sheet 1 of 1			
SITE		Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia				GEOLOGY		Sandstone		VEGETATION		Grass		PROJECT NO. P1002863			
EQUIPMENT		Spade				EASTING		NA		RL SURFACE		NA					
EXCAVATION DIMENSIONS		3.0m X 1.0m X 0.6m				NORTHING		NA		ASPECT		North		SLOPE		5-10%	
EXCAVATION DATA						MATERIAL DATA						SAMPLING & TESTING					
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA Soil type, texture, structure, mottling, colour, plasticity, rocks, oxidation, particle characteristics, organics, secondary and minor components, fill, contamination, odour.		CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)				
S	Nil	N	D	0.05			SM	ORGANIC SILTY SAND - Brown, dry, rootlets.				A	0.05	2863/125/ 0.05			
S	Nil	N	D				SC	CLAYEY SAND - Orange/yellow, moist, fine grained, minor gravels (5-10mm, 5%).				A	0.3	2863/125/ 0.3 + DUP3 CBR 125 0.1-0.4			
S	Nil	N	D	0.4			SP	GRAVELLY SAND - Gravels (5-50mm, 30/40%) - Light brown, moist.									
S				0.6				Test pit terminated at 0.6m on gravelly sand.									
				1.0													
				2.0													
				3.0													
				4.0													
				4.5													
EQUIPMENT / METHOD		SUPPORT		WATER		MOISTURE		PENETRATION		CONSISTENCY		DENSITY		SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION	
N Natural exposure		SH Shoring		N None observed		D Dry		L Low		VS Very Soft		VL Very Loose		A Auger sample		pp Pocket penetrometer	
S Spade		SC Shotcrete		X Not measured		M Moist		M Moderate		S Soft		L Loose		B Bulk sample		S Standard penetration test	
BH Backhoe bucket		RB Rock Bolts		Water level		W Wet		H High		F Firm		MD Medium Dense		U Undisturbed sample		VS Vane shear	
HA Hand auger		Nil No support		Water outflow		Wp Plastic limit		R Refusal		St Stiff		D Dense		D Disturbed sample		DCP Dynamic cone penetrometer	
A Auger				Water inflow		WI Liquid limit				VSt Very Stiff		VD Very Dense		M Moisture content		FD Field density	
CC Concrete Corer										H Hard				Ux Tube sample (x mm)		WS Water sample	
V V-Bit										F Friable				E Environmental sample			
TC Tungsten Carbide Bit																	
PT Push tube																	
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS																	
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CLIENT		Shoalhaven City Council				COMMENCED		19.09.12		COMPLETED		19.09.12		REF		TP126	
PROJECT		Geotechnical and Contamination Assessment				LOGGED		BM/JF		CHECKED		JF		Sheet 1 of 1			
SITE		Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia				GEOLOGY		Sandstone		VEGETATION		Grass		PROJECT NO. P1002863			
EQUIPMENT		Backhoe				EASTING		NA		RL SURFACE		NA					
EXCAVATION DIMENSIONS		3.0m X 1.0m X 2.5m				NORTHING		NA		ASPECT		North		SLOPE		5-10%	
EXCAVATION DATA						MATERIAL DATA						SAMPLING & TESTING					
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA Soil type, texture, structure, mottling, colour, plasticity, rocks, oxidation, particle characteristics, organics, secondary and minor components, fill, contamination, odour.		CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)				
BH	Nil	N	D				XX	FILL - Gravelly/clayey sand, orange/brown, moist, gravels (5-20mm, 20-30%), some cobbles.				E	0.25	2863/126/ 0.25			
				0.8				New organic layer at 0.8m.									
BH	Nil	N	D	1.0			SC	CLAYEY SAND - Orange/yellow, moist, fine grained, minor gravels (5-10mm, 5%).				E	0.9	2863/126/ 0.9			
				1.2								B	1.0	2863/126/ 1.0			
BH	Nil	N	D				SC	GRAVELLY/CLAYEY SAND - Orange/brown, moist, gravels (5-20mm, 30-40%).									
				1.8				Grades to									
BH	Nil	N	D	2.0			EW	EXTREMELY WEAK SANDSTONE - Grey, coarse grained sandstone with conglomerate rounded quartz.				B	2.0	2863/126/ 2.0			
				2.5								B	2.4	2863/126/ 2.4			
								Test pit terminated at 2.5m on extremely weak sandstone.									
				3.0													
				4.0													
				4.5													
EQUIPMENT / METHOD		SUPPORT		WATER		MOISTURE		PENETRATION		CONSISTENCY		DENSITY		SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION	
N Natural exposure		SH Shoring		N None observed		D Dry		L Low		VS Very Soft		VL Very Loose		A Auger sample		pp Pocket penetrometer	
S Spade		SC Shotcrete		X Not measured		M Moist		M Moderate		S Soft		L Loose		B Bulk sample		S Standard penetration test	
BH Backhoe bucket		RB Rock Bolts		W Water level		W Wet		H High		F Firm		MD Medium Dense		U Undisturbed sample		VS Vane shear	
HA Hand auger		Nil No support		Water outflow		Wp Plastic limit		R Refusal		St Stiff		D Dense		D Disturbed sample		DCP Dynamic cone penetrometer	
A Auger				Water inflow		WL Liquid limit				VSt Very Stiff		VD Very Dense		M Moisture content		FD Field density	
CC Concrete Corer										H Hard				Ux Tube sample (x mm)		WS Water sample	
V V-Bit										F Friable				E Environmental sample			
TC Tungsten Carbide Bit																	
PT Push tube																	
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS																	
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CLIENT		Shoalhaven City Council				COMMENCED		19.09.12		COMPLETED		19.09.12		REF		TP127	
PROJECT		Geotechnical and Contamination Assessment				LOGGED		BM/JF		CHECKED		JF		Sheet 1 of 1			
SITE		Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia				GEOLOGY		Sandstone		VEGETATION		Grass		PROJECT NO. P1002863			
EQUIPMENT		Backhoe				EASTING		NA		RL SURFACE		NA					
EXCAVATION DIMENSIONS		3.0m X 1.0m X 1.4m				NORTHING		NA		ASPECT		North		SLOPE		5-10%	
EXCAVATION DATA						MATERIAL DATA						SAMPLING & TESTING					
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA Soil type, texture, structure, mottling, colour, plasticity, rocks, oxidation, particle characteristics, organics, secondary and minor components, fill, contamination, odour.		CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)				
BH	Nil	N	D	0.1			SM	ORGANIC SILTY SAND - Brown, dry, rootlets.				E	0.05	2863/127/ 0.05			
BH	Nil	N	D	0.4			SC	CLAYEY SAND - Orange/yellow, moist, fine grained, minor gravels (5-10mm, 5%).				E B	0.3 0.3	2863/127/ 0.3 2863/127/ 0.3			
BH	Nil	N	D	1.0			SC	GRAVELLY/CLAYEY SAND - Orange/brown, moist, gravels (5-20mm, 30-40%).									
BH	Nil	N	D	1.1				Grades to									
BH	Nil	N	D	1.4			EW	EXTREMELY WEAK SANDSTONE - Grey, coarse grained sandstone with conglomerate rounded quartz.				E B	1.2 1.2	2863/127/ 1.2 2863/127/ 1.2			
				2.0				Test pit terminated at 1.4m (bucket refusal) on weak to medium strong sandstone.									
				3.0													
				4.0													
				4.5													
EQUIPMENT / METHOD		SUPPORT		WATER		MOISTURE		PENETRATION		CONSISTENCY		DENSITY		SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION	
N Natural exposure		SH Shoring		N None observed		D Dry		L Low		VS Very Soft		VL Very Loose		A Auger sample		pp Pocket penetrometer	
S Spade		SC Shotcrete		X Not measured		M Moist		M Moderate		S Soft		L Loose		B Bulk sample		S Standard penetration test	
BH Backhoe bucket		RB Rock Bolts		▽ Water level		W Wet		H High		F Firm		MD Medium Dense		U Undisturbed sample		VS Vane shear	
HA Hand auger		Nil No support		⚠ Water outflow		Wp Plastic limit		R Refusal		St Stiff		D Dense		D Disturbed sample		DCP Dynamic cone penetrometer	
A Auger				⚡ Water inflow		WL Liquid limit				VSt Very Stiff		VD Very Dense		M Moisture content		FD Field density	
CC Concrete Corer										H Hard				Ux Tube sample (x mm)		WS Water sample	
V V-Bit										F Friable				E Environmental sample			
TC Tungsten Carbide Bit																	
PT Push tube																	
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS																	
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CLIENT		Shoalhaven City Council				COMMENCED		19.09.12		COMPLETED		19.09.12		REF		TP128	
PROJECT		Geotechnical and Contamination Assessment				LOGGED		BM/JF		CHECKED		JF		Sheet 1 of 1			
SITE		Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia				GEOLOGY		Sandstone		VEGETATION		Grass		PROJECT NO. P1002863			
EQUIPMENT		Backhoe				EASTING		NA		RL SURFACE		NA					
EXCAVATION DIMENSIONS		3.0m X 1.0m X 1.3m				NORTHING		NA		ASPECT		North		SLOPE		5-10%	
EXCAVATION DATA						MATERIAL DATA						SAMPLING & TESTING					
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA Soil type, texture, structure, mottling, colour, plasticity, rocks, oxidation, particle characteristics, organics, secondary and minor components, fill, contamination, odour.		CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)				
BH	Nil	N	D	0.1			SM	ORGANIC SILTY SAND - Brown, dry, rootlets.				E	0.05	2863/128/ 0.05			
BH	Nil	N	D				SC	CLAYEY SAND - Orange/yellow, moist, fine grained, minor gravels (5-10mm, 5%).				B	0.2-0.3	2863/128/ 0.2-0.3			
												E	0.3	2863/128/ 0.3			
												B	0.2-0.4	CBR @ 0.2-0.4m 2863/128/ 0.2-0.4			
BH	Nil	N	D	0.5			CL	SANDY CLAY - Orange/grey/red mottles, moist.									
				1.0								B	1.0	2863/128/ 1.0			
				1.1				Grades to									
BH	Nil	N	D	1.3			EW	EXTREMELY WEAK SANDSTONE - Grey, with ferruginised gravels.									
								Test pit terminated at 1.3m on weak sandstone.									
				2.0													
				3.0													
				4.0													
				4.5													
EQUIPMENT / METHOD		SUPPORT		WATER		MOISTURE		PENETRATION		CONSISTENCY		DENSITY		SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION	
N Natural exposure		SH Shoring		N None observed		D Dry		L Low		VS Very Soft		VL Very Loose		A Auger sample		pp Pocket penetrometer	
S Spade		SC Shotcrete		X Not measured		M Moist		M Moderate		S Soft		L Loose		B Bulk sample		S Standard penetration test	
BH Backhoe bucket		RB Rock Bolts		▽ Water level		W Wet		H High		F Firm		MD Medium Dense		U Undisturbed sample		VS Vane shear	
HA Hand auger		Nil No support		⚠ Water outflow		Wp Plastic limit		R Refusal		St Stiff		D Dense		D Disturbed sample		DCP Dynamic cone	
A Auger				⚡ Water inflow		Wl Liquid limit				VSt Very Stiff		VD Very Dense		M Moisture content		penetrometer	
CC Concrete Corer										H Hard				Ux Tube sample (x mm)		FD Field density	
V V-Bit										F Friable				E Environmental sample		WS Water sample	
TC Tungsten Carbide Bit																	
PT Push tube																	
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS																	
<div><div><div><div>MARTENS &amp; ASSOCIATES PTY LTD</div><div>6/37 Leighton Place</div><div>Hornsby, NSW 2077 Australia</div><div>Phone: (02) 9476 9999 Fax: (02) 9476 8767</div><div>mail@martens.com.au WEB: http://www.martens.com.au</div></div></div><div><div>Engineering Log -</div><div>Excavation</div></div></div>																	

CLIENT		Shoalhaven City Council				COMMENCED		19.09.12		COMPLETED		19.09.12		REF		TP131	
PROJECT		Geotechnical and Contamination Assessment				LOGGED		BM/JF		CHECKED		JF		Sheet 1 of 1			
SITE		Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia				GEOLOGY		Sandstone		VEGETATION		Grass		PROJECT NO. P1002863			
EQUIPMENT		Backhoe				EASTING		NA		RL SURFACE		NA					
EXCAVATION DIMENSIONS		3.0m X 1.0m X 1.3m				NORTHING		NA		ASPECT		North		SLOPE		5-10%	
EXCAVATION DATA						MATERIAL DATA						SAMPLING & TESTING					
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA Soil type, texture, structure, mottling, colour, plasticity, rocks, oxidation, particle characteristics, organics, secondary and minor components, fill, contamination, odour.		CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)				
BH	Nil	N	D	0.05			SM	ORGANIC SILTY SAND - Brown, dry, rootlets.				A	0.05	2863/131/ 0.05 + DUP4			
BH	Nil	N	D	0.4			SC	CLAYEY SAND - Orange/yellow, moist, fine grained, minor gravels (5-10mm, 5%).				A	0.25	2863/131/ 0.25			
BH	Nil	N	D	1.05			SP	GRAVELLY SAND - Gravels (5-50mm, 30/40%) - Light brown, moist.				B	0.5	2863/131/ 0.5			
BH	Nil	N	D	1.3			EW	EXTREMELY WEAK SANDSTONE - Light grey, sandy clay properties, sandstone gravels and cobbles.				B	1.2	2863/131/ 1.2			
				2.0				Test pit terminated at 1.3m on weak sandstone.									
				3.0													
				4.0													
				4.5													
EQUIPMENT / METHOD		SUPPORT		WATER		MOISTURE		PENETRATION		CONSISTENCY		DENSITY		SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION	
N Natural exposure		SH Shoring		N None observed		D Dry		L Low		VS Very Soft		VL Very Loose		A Auger sample		pp Pocket penetrometer	
S Spade		SC Shotcrete		X Not measured		M Moist		M Moderate		S Soft		L Loose		B Bulk sample		S Standard penetration test	
BH Backhoe bucket		RB Rock Bolts		▽ Water level		W Wet		H High		F Firm		MD Medium Dense		U Undisturbed sample		VS Vane shear	
HA Hand auger		Nil No support				Wp Plastic limit		R Refusal		St Stiff		D Dense		D Disturbed sample		DCP Dynamic cone	
A Auger						WL Liquid limit				VSt Very Stiff		VD Very Dense		M Moisture content		penetrometer	
CC Concrete Corer										H Hard				Ux Tube sample (x mm)		FD Field density	
V V-Bit										F Friable				E Environmental sample		WS Water sample	
TC Tungsten Carbide Bit																	
PT Push tube																	
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS																	
						MARTENS & ASSOCIATES PTY LTD 6/37 Leighton Place Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767 mail@martens.com.au WEB: http://www.martens.com.au						Engineering Log - Excavation					

CLIENT		Shoalhaven City Council			COMMENCED		19.09.12		COMPLETED		19.09.12		REF		TP136		
PROJECT		Geotechnical and Contamination Assessment			LOGGED		BM/JF		CHECKED		JF		Sheet 1 of 1				
SITE		Lot 1/DP1021332 and Lot 458/DP1063107 George Evans Rd, Mundamia			GEOLOGY		Sandstone		VEGETATION		Grass		PROJECT NO. P1002863				
EQUIPMENT				Backhoe			EASTING		NA		RL SURFACE		NA				
EXCAVATION DIMENSIONS				3.0m X 1.0m X 0.6m			NORTHING		NA		ASPECT		North		SLOPE 5-10%		
EXCAVATION DATA						MATERIAL DATA						SAMPLING & TESTING					
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	PENETRATION RESISTANCE	GRAPHIC LOG	CLASSIFICATION	DESCRIPTION OF STRATA Soil type, texture, structure, mottling, colour, plasticity, rocks, oxidation, particle characteristics, organics, secondary and minor components, fill, contamination, odour.		CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)				
BH	Nil	N	D	0.6			XX	FILL - SILTY SAND - Light brown, gravels (5-10mm, 10%).				A	0.05	2863/136/ 0.05			
				0.6								B	0.5	2863/136/ 0.5			
				1.0				Test pit terminated at 0.6m on silty sand.									
				2.0													
				3.0													
				4.0													
				4.5													
EQUIPMENT / METHOD		SUPPORT		WATER		MOISTURE		PENETRATION		CONSISTENCY		DENSITY		SAMPLING & TESTING		CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION	
N Natural exposure		SH Shoring		N None observed		D Dry		L Low		VS Very Soft		VL Very Loose		A Auger sample		pp Pocket penetrometer	
S Spade		SC Shotcrete		X Not measured		M Moist		M Moderate		S Soft		L Loose		B Bulk sample		S Standard penetration test	
BH Backhoe bucket		RB Rock Bolts				W Wet		H High		F Firm		MD Medium Dense		U Undisturbed sample		VS Vane shear	
HA Hand auger		Nil No support				Wp Plastic limit		R Refusal		St Stiff		D Dense		D Disturbed sample		DCP Dynamic cone penetrometer	
A Auger						WL Liquid limit				VSt Very Stiff		VD Very Dense		M Moisture content		FD Field density	
CC Concrete Corer										H Hard				Ux Tube sample (x mm)		WS Water sample	
V V-Bit										F Friable				E Environmental sample			
TC Tungsten Carbide Bit																	
PT Push tube																	
EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS																	
<div><div></div><div>MARTENS &amp; ASSOCIATES PTY LTD 6/37 Leighton Place Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767 mail@martens.com.au WEB: http://www.martens.com.au</div><div>Engineering Log - Excavation</div></div>																	

Quality Sheet No. 4

## 12 Attachment E -Laboratory Analytical Certificates



**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:	<b><u>2863-soil and material sampling-Mura</u></b>
No. of samples:	50 Soils, 3 Materials
Date samples received / completed instructions received	24/09/2012, 25/09/2012, 25/09/2012, 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  
NATA accreditation number 2901. This document shall not be reproduced except in full.  
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with \*.**

**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
vTRHC <sub>6</sub> - C <sub>9</sub>	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	-----	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	-	29/09/2012	29/09/2012	29/09/2012	29/09/2012	29/09/2012
vTRHC <sub>6</sub> - C <sub>9</sub>	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

vTRH & BTEX 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
vTRHC <sub>6</sub> - C <sub>9</sub>	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

**Client Reference: 2863-soil and material sampling-Mura**

vTRH & BTEX in Soil						
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
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
vTRHC <sub>6</sub> - C <sub>9</sub>	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:	UNITS	79298-25	79298-26	79298-27	79298-28	79298-29
Your Reference	-----	2863/102	2863/Dup2	2863/103	2863/SS114	2863/105
Depth	-----	1.5	-	1.2	-	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	-	29/09/2012	29/09/2012	29/09/2012	29/09/2012	29/09/2012
vTRHC <sub>6</sub> - C <sub>9</sub>	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 & BTEX in Soil						
Our Reference:	UNITS	79298-31	79298-32	79298-33	79298-34	79298-35
Your Reference	-----	2863/108	2863/136	2863/123	2863/120	2863/138
Depth	-----	1.0	0.2	0.1	0.2	0.5
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	-	29/09/2012	29/09/2012	29/09/2012	29/09/2012	29/09/2012
vTRHC <sub>6</sub> - C <sub>9</sub>	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

Client Reference: 2863-soil and material sampling-Mura

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
vTRHC <sub>6</sub> - C <sub>9</sub>	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
vTRHC <sub>6</sub> - C <sub>9</sub>	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 <sub>10</sub> - C <sub>14</sub>	mg/kg	<50	<50	<50	<50	<50
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	110	<100	<100	<100	<100
TRHC <sub>29</sub> - C <sub>36</sub>	mg/kg	140	<100	110	120	<100
Surrogate o-Terphenyl	%	89	86	84	88	86

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 <sub>10</sub> - C <sub>14</sub>	mg/kg	<50	<50	<50	<50	<50
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	<100	<100	<100	<100	<100
TRHC <sub>29</sub> - C <sub>36</sub>	mg/kg	<100	150	150	<100	<100
Surrogate o-Terphenyl	%	83	92	88	86	86

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
TRHC <sub>10</sub> - C <sub>14</sub>	mg/kg	<50	<50	<50	<50	<50
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	<100	<100	<100	<100	<100
TRHC <sub>29</sub> - C <sub>36</sub>	mg/kg	<100	<100	<100	<100	<100
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
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 <sub>10</sub> - C <sub>14</sub>	mg/kg	<50	<50	<50	<50	<50
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	<100	<100	<100	<100	<100
TRHC <sub>29</sub> - C <sub>36</sub>	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	85	83	73	77	83

sTRH in Soil (C10-C36)						
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	-----	1.5	-	1.2	-	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
TRHC <sub>10</sub> - C <sub>14</sub>	mg/kg	<50	<50	<50	<50	<50
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	<100	<100	130	<100	<100
TRHC <sub>29</sub> - C <sub>36</sub>	mg/kg	180	240	110	<100	100
Surrogate o-Terphenyl	%	83	82	85	85	67

sTRH in Soil (C10-C36)						
Our Reference:	UNITS	79298-31	79298-32	79298-33	79298-34	79298-35
Your Reference	-----	2863/108	2863/136	2863/123	2863/120	2863/138
Depth	-----	1.0	0.2	0.1	0.2	0.5
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
TRHC <sub>10</sub> - C <sub>14</sub>	mg/kg	<50	<50	<50	<50	<50
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	<100	<100	<100	<100	<100
TRHC <sub>29</sub> - C <sub>36</sub>	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	66	77	75	65	79

sTRH in Soil (C10-C36)						
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	-	27/09/2012	27/09/2012	27/09/2012	27/09/2012	27/09/2012
TRHC <sub>10</sub> - C <sub>14</sub>	mg/kg	<50	<50	<50	<50	<50
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	<100	<100	<100	<100	<100
TRHC <sub>29</sub> - C <sub>36</sub>	mg/kg	610	<100	<100	<100	120
Surrogate o-Terphenyl	%	72	72	71	72	67

sTRH in Soil (C10-C36)		
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 <sub>10</sub> - C <sub>14</sub>	mg/kg	<50
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	<100
TRHC <sub>29</sub> - C <sub>36</sub>	mg/kg	<100
Surrogate o-Terphenyl	%	81

PAHs 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
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 <sub>14</sub>	%	91	95	97	95	98

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	79298-6 2863/130 0.05 19/09/2012 Soil	79298-7 2863/134 - 19/09/2012 Soil	79298-8 2863/133 0.05 19/09/2012 Soil	79298-9 2863/118 0.05 19/09/2012 Soil	79298-11 2863/117 0.3 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	<0.1	<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 <sub>14</sub>	%	94	95	97	99	93

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	79298-13 2863/SS119 - 19/09/2012 Soil	79298-14 2863/SS122 - 19/09/2012 Soil	79298-15 2863/116 0.15 19/09/2012 Soil	79298-16 2863/103 0.25 19/09/2012 Soil	79298-19 2863/125 0.3 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	<0.1	<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 <sub>14</sub>	%	99	80	84	87	90

PAHs 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
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	0.4	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	0.4	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	0.2	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	0.2	<0.1	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	0.3	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	0.27	<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 <sub>14</sub>	%	93	93	79	87	92



PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	79298-25 2863/102 1.5 19/09/2012 Soil	79298-26 2863/Dup2 - 19/09/2012 Soil	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
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-d <sub>14</sub>	%	91	92	93	94	77

PAHs in Soil 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	-	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	0.2
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	0.5
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.4
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	4.9
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.8
Fluoranthene	mg/kg	0.2	<0.1	<0.1	0.1	4.0
Pyrene	mg/kg	0.2	<0.1	<0.1	0.1	4.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	1.7
Chrysene	mg/kg	0.2	<0.1	<0.1	<0.1	1.6
Benzo(b+k)fluoranthene	mg/kg	0.4	<0.2	<0.2	<0.2	2.3
Benzo(a)pyrene	mg/kg	0.37	<0.05	<0.05	0.1	2.0
Indeno(1,2,3-c,d)pyrene	mg/kg	0.2	<0.1	<0.1	<0.1	0.9
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Benzo(g,h,i)perylene	mg/kg	0.2	<0.1	<0.1	<0.1	0.7
Surrogate p-Terphenyl-d <sub>14</sub>	%	73	85	85	76	65

PAHs in Soil 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	-	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-d <sub>14</sub>	%	80	82	82	81	71

PAHs in Soil 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
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 <sub>14</sub>	%	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	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	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	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	%	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

Organophosphorus Pesticides						
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	-	27/9/2012	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
Chlorpyrifos-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
Chlorpyrifos	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

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
Chlorpyrifos-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
Chlorpyrifos	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	98	78	81	85

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
Chlorpyrifos-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
Chlorpyrifos	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

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
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1
Chlorpyrifos	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



**Client Reference: 2863-soil and material sampling-Mura**

PCBs in Soil 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
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

PCBs in Soil 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 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	98	78	81	85

PCBs in Soil 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 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	%	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

Acid Extractable metals 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 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:	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 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:	UNITS	79298-12	79298-13	79298-14	79298-15	79298-16
Your Reference	-----	2863/117	2863/SS119	2863/SS122	2863/116	2863/103
Depth	-----	1.0	-	-	0.15	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	[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
Mercury	mg/kg	[NA]	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	[NA]	1	2	3	8
Zinc	mg/kg	[NA]	58	64	5	41

**Client Reference: 2863-soil and material sampling-Mura**

Acid Extractable metals in soil						
Our Reference:	UNITS	79298-12	79298-13	79298-14	79298-15	79298-16
Your Reference	-----	2863/117	2863/SS119	2863/SS122	2863/116	2863/103
Depth	-----	1.0	-	-	0.15	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	220	[NA]	[NA]	[NA]	[NA]

Acid Extractable metals in soil						
Our Reference:	UNITS	79298-17	79298-18	79298-19	79298-20	79298-21
Your Reference	-----	2863/103	2863/125	2863/125	2863/Dup3	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
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	[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:	UNITS	79298-22	79298-23	79298-24	79298-25	79298-26
Your Reference	-----	2863/107	2863/121	2863/137	2863/102	2863/Dup2
Depth	-----	0.05	0.05	0.15	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 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		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	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	-----	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 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

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
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	23	57	130	[NA]	<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
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

Total Phenolics 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	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						
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	-	27/09/2012	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	79298-33	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	-	27/09/2012	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)	mg/kg	<5	<5	<5

Moisture						
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 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	7.7	7.8	7.0	9.5

Moisture						
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 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	%	13	7.1	17	11	9.1

Moisture						
Our Reference:	UNITS	79298-12	79298-13	79298-14	79298-15	79298-16
Your Reference	-----	2863/117	2863/SS119	2863/SS122	2863/116	2863/103
Depth	-----	1.0	-	-	0.15	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 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	%	13	17	25	9.7	24

Moisture						
Our Reference:	UNITS	79298-17	79298-18	79298-19	79298-20	79298-21
Your Reference	-----	2863/103	2863/125	2863/125	2863/Dup3	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
Type of sample		Soil	Soil	Soil	Soil	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	%	14	9.0	7.8	19	15

Moisture						
Our Reference:	UNITS	79298-22	79298-23	79298-24	79298-25	79298-26
Your Reference	-----	2863/107	2863/121	2863/137	2863/102	2863/Dup2
Depth	-----	0.05	0.05	0.15	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 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	%	8.5	17	5.2	28	29



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Moisture						
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 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

Moisture						
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 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

Moisture						
Our Reference:	UNITS	79298-38	79298-39	79298-40	79298-42	79298-46
Your Reference	-----	2863/112	2863/113	2863/104	2863/118	MA Blank 1
Depth	-----	0.5	0.4	0.3	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 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:	UNITS	79298-48	79298-51
Your Reference	-----	MA Blank 2	2863/126
Depth	-----	-	0.25
Date Sampled		19/09/2012	19/09/2012
Type of sample		Soil	Soil
Date prepared	-	27/09/2012	27/09/2012
Date analysed	-	27/09/2012	27/09/2012
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	Approx 40g	Approx 40g	Approx 40g	Approx 40g
Sample Description	-	Brown coarse-grained soil	Brown coarse-grained soil	Brown coarse-grained soil	Brown coarse-grained soil	Brown coarse-grained soil
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres 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	Approx 40g	Approx 40g	Approx 40g	Approx 40g
Sample Description	-	Brown coarse-grained soil	Brown coarse-grained sandy soil	Brown fine-grained clayey soil	Brown coarse-grained soil	Brown fine-grained clayey soil
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected

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	Approx 40g	Approx 40g	Approx 40g	Approx 40g
Sample Description	-	Brown fine-grained clayey soil	Brown fine-grained clayey soil	Brown coarse-grained soil	Brown fine-grained soil	Brown coarse-grained clayey soil
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres 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	Approx 40g	Approx 40g	Approx 40g	Approx 40g
Sample Description	-	Brown coarse-grained soil	Beige coarse-grained soil	Brown fine-grained clayey soil	Brown coarse-grained soil	Brown fine-grained soil & organic debris
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres 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		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	Approx 40g	Approx 40g	Approx 40g	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	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	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

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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
pH <sub>f</sub> (field pH test)*	pH Units	4.5	4.7	5.2	5.1	5.7
pH <sub>fox</sub> (field peroxide test)*	pH Units	2.0	2.7	1.9	2.6	3.7
Reaction Rate*	-	Moderate	Moderate	Moderate	Moderate	Moderate

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
pH <sub>f</sub> (field pH test)*	pH Units	5.2	5.4	4.7	6.9	5.0
pH <sub>fox</sub> (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	-----	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
pH <sub>f</sub> (field pH test)*	pH Units	4.8	5.3	4.9	5.5	5.7
pH <sub>fox</sub> (field peroxide test)*	pH Units	3.0	3.3	3.4	3.5	3.7
Reaction Rate*	-	Slight	Slight	Moderate	Moderate	Moderate



MethodID	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 distillation, 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.

**Client Reference: 2863-soil and material sampling-Mura**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
vTRH & BTEX in Soil						Base II Duplicate II %RPD		
Date extracted	-			27/09/2012	79298-1	27/09/2012    27/09/2012	LCS-4	27/09/2012
Date analysed	-			29/09/2012	79298-1	29/09/2012    29/09/2012	LCS-4	29/09/2012
vTRHC <sub>6</sub> - C <sub>9</sub>	mg/kg	25	Org-016	<25	79298-1	<25    <25	LCS-4	114%
Benzene	mg/kg	0.2	Org-016	<0.2	79298-1	<0.2    <0.2	LCS-4	118%
Toluene	mg/kg	0.5	Org-016	<0.5	79298-1	<0.5    <0.5	LCS-4	114%
Ethylbenzene	mg/kg	1	Org-016	<1	79298-1	<1    <1	LCS-4	112%
m+p-xylene	mg/kg	2	Org-016	<2	79298-1	<2    <2	LCS-4	113%
o-Xylene	mg/kg	1	Org-016	<1	79298-1	<1    <1	LCS-4	105%
Surrogate aaa-Trifluorotoluene	%		Org-016	100	79298-1	87    101    RPD: 15	LCS-4	107%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
sTRH in Soil (C10-C36)						Base II Duplicate II %RPD		
Date extracted	-			27/09/2012	79298-1	27/09/2012    27/09/2012	LCS-4	27/09/2012
Date analysed	-			27/09/2012	79298-1	27/09/2012    27/09/2012	LCS-4	27/09/2012
TRHC <sub>10</sub> - C <sub>14</sub>	mg/kg	50	Org-003	<50	79298-1	<50    <50	LCS-4	91%
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	100	Org-003	<100	79298-1	110    <100	LCS-4	108%
TRHC <sub>29</sub> - C <sub>36</sub>	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	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Date extracted	-			27/09/2012	79298-1	27/09/2012    27/09/2012	LCS-4	27/09/2012
Date analysed	-			28/09/2012	79298-1	29/09/2012    29/09/2012	LCS-4	28/09/2012
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	79298-1	<0.1    <0.1	LCS-4	113%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	79298-1	<0.1    <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	79298-1	<0.1    <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	79298-1	<0.1    <0.1	LCS-4	117%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	79298-1	<0.1    <0.1	LCS-4	100%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	79298-1	<0.1    <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	79298-1	<0.1    <0.1	LCS-4	100%
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	79298-1	<0.1    <0.1	LCS-4	114%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	79298-1	<0.1    <0.1	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	79298-1	<0.1    <0.1	LCS-4	110%

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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-d14	%		Org-012 subset	78	79298-1	91    101    RPD: 10	LCS-4	81%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Organochlorine Pesticides in soil						Base II Duplicate II %RPD		
Date extracted	-			27/9/2012	79298-31	27/9/2012    27/9/2012	LCS-5	27/9/2012
Date analysed	-			29/9/2012	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%

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

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QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base II Duplicate II %RPD		
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	79298-1	2    2    RPD: 0	LCS-1	95%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	79298-1	5    4    RPD: 22	LCS-1	98%
Magnesium	mg/kg	5	Metals-020 ICP-AES	<5	[NT]	[NT]	LCS-1	93%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Total Phenolics in Soil						Base II Duplicate II %RPD		
Date extracted	-			27/09/2012	79298-7	27/09/2012    27/09/2012	LCS-1	27/09/2012
Date analysed	-			27/09/2012	79298-7	27/09/2012    27/09/2012	LCS-1	27/09/2012
Total Phenolics (as Phenol)	mg/kg	5	Inorg-030	<5	79298-7	<5    <5	LCS-1	81%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank				
Moisture								
Date prepared	-			[NT]				
Date analysed	-			[NT]				
Moisture	%	0.1	Inorg-008	[NT]				
Asbestos ID - soils								
Date analysed	-			[NT]				
Asbestos ID - materials								
Date analysed	-			[NT]				
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
ESP/CEC						Base II Duplicate II %RPD		
Exchangeable Ca	meq/100 g	0.1	Metals-009	<0.1	79298-12	<0.1    <0.1	LCS-1	100%
Exchangeable K	meq/100 g	0.1	Metals-009	<0.1	79298-12	<0.1    <0.1	LCS-1	99%
Exchangeable Mg	meq/100 g	0.1	Metals-009	<0.1	79298-12	1.5    1.5    RPD: 0	LCS-1	96%
Exchangeable Na	meq/100 g	0.1	Metals-009	<0.1	79298-12	<0.1    <0.1	LCS-1	99%
Cation Exchange Capacity	meq/100 g	1	Metals-009	<1.0	79298-12	1.7    1.7    RPD: 0	[NR]	[NR]
ESP	%	1	Metals-009	<1.0	79298-12	5.8    5.6    RPD: 4	[NR]	[NR]

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QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Miscellaneous Inorg - soil						Base    Duplicate    %RPD		
Date prepared	-			28/09/2012	[NT]	[NT]	LCS-1	28/09/2012
Date analysed	-			28/09/2012	[NT]	[NT]	LCS-1	28/09/2012
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	LCS-1	102%
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	[NT]	[NT]	LCS-1	106%
Chloride, Cl 1:5 soil:water	mg/kg	2	Inorg-081	<2	[NT]	[NT]	LCS-1	116%
Sulphate, SO4 1:5 soil:water	mg/kg	2	Inorg-081	<2	[NT]	[NT]	LCS-1	119%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank				
sPOCAS field test								
pH <sub>f</sub> (field pH test)*	pH Units		Inorg-063	[NT]				
pH <sub>fox</sub> (field peroxide test)*	pH Units		Inorg-063	[NT]				
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	
Date analysed	-	79298-11		29/09/2012    29/09/2012		LCS-5	29/09/2012	
vTRHC <sub>6</sub> - C <sub>9</sub>	mg/kg	79298-11		<25    <25		LCS-5	113%	
Benzene	mg/kg	79298-11		<0.2    <0.2		LCS-5	121%	
Toluene	mg/kg	79298-11		<0.5    <0.5		LCS-5	117%	
Ethylbenzene	mg/kg	79298-11		<1    <1		LCS-5	107%	
m+p-xylene	mg/kg	79298-11		<2    <2		LCS-5	109%	
o-Xylene	mg/kg	79298-11		<1    <1		LCS-5	100%	
Surrogate aaa-Trifluorotoluene	%	79298-11		109    102    RPD: 7		LCS-5	112%	
QUALITYCONTROL	UNITS	Dup. Sm#		Duplicate		Spike Sm#	Spike % Recovery	
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	
TRHC <sub>10</sub> - C <sub>14</sub>	mg/kg	79298-11		<50    <50		LCS-5	88%	
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	79298-11		<100    <100		LCS-5	102%	
TRHC <sub>29</sub> - C <sub>36</sub>	mg/kg	79298-11		<100    <100		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	
Date analysed	-	79298-11		29/09/2012    29/09/2012		LCS-5	28/09/2012	
Naphthalene	mg/kg	79298-11		<0.1    <0.1		LCS-5	105%	
Acenaphthylene	mg/kg	79298-11		<0.1    <0.1		[NR]	[NR]	
Acenaphthene	mg/kg	79298-11		<0.1    <0.1		[NR]	[NR]	
Fluorene	mg/kg	79298-11		<0.1    <0.1		LCS-5	108%	

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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%
Pyrene	mg/kg	79298-11	<0.1    <0.1	LCS-5	104%
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- d14	%	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]	[NT]	[NR]	[NR]
pp-DDT	mg/kg	[NT]	[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 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]
Chlorpyrifos-methyl	mg/kg	[NT]	[NT]	[NR]	[NR]
Ronnel	mg/kg	[NT]	[NT]	[NR]	[NR]
Chlorpyrifos	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%
QUALITYCONTROL 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%
QUALITYCONTROL 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: 2863-soil and material sampling-Mura**

QUALITYCONTROL 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 Miscellaneous Inorg - soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
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, SO4 1:5 soil:water	mg/kg	[NT]	[NT]	79298-2	119%
QUALITYCONTROL 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
vTRHC <sub>6</sub> - C <sub>9</sub>	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 sTRH in Soil (C10-C36)	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	27/09/2012    27/09/2012	79298-2	27/09/2012
TRHC <sub>10</sub> - C <sub>14</sub>	mg/kg	79298-21	<50    <50	79298-2	94%
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	79298-21	<100    <100	79298-2	119%
TRHC <sub>29</sub> - C <sub>36</sub>	mg/kg	79298-21	<100    <100	79298-2	111%
Surrogate o-Terphenyl	%	79298-21	83    84    RPD: 1	79298-2	102%
QUALITYCONTROL PAHs 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	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 material sampling-Mura**

QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
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 <sub>14</sub>	%	79298-21	93    105    RPD: 12	79298-2	99%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
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%
QUALITY CONTROL 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
vTRHC <sub>6</sub> - C <sub>9</sub>	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: 2863-soil and material sampling-Mura**

QUALITY CONTROL sTRH in Soil (C10-C36)	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	27/09/2012    27/09/2012	79298-32	27/09/2012
TRHC <sub>10</sub> - C <sub>14</sub>	mg/kg	79298-31	<50    <50	79298-32	88%
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	79298-31	<100    <100	79298-32	106%
TRHC <sub>28</sub> - C <sub>36</sub>	mg/kg	79298-31	<100    <100	79298-32	93%
Surrogate o-Terphenyl	%	79298-31	66    72    RPD: 9	79298-32	114%
QUALITY CONTROL PAHs 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
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 <sub>14</sub>	%	79298-31	73    83    RPD: 13	79298-32	82%

**Client Reference: 2863-soil and material sampling-Mura**

QUALITYCONTROL 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]
QUALITYCONTROL 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  
NA: Test not required  
<: Less than

PQL: Practical Quantitation Limit  
RPD: Relative Percent Difference  
>: Greater than

NT: Not tested  
NA: Test not required  
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.

## 13 Attachment F- Data Validation Report

# DATA VALIDATION REPORT - STAGE 1 and 2 ESA: George Evans Rd, Mundamia, NSW

## 1. Sample Handling

Yes	No
	(Comments below)

a. Were sample holding times met?

✓

b. Were samples in proper custody between the field and reaching the laboratory?

✓

c. Were the samples properly and adequately preserved?

✓

d. Were the samples received by the laboratory in good condition?

✓

### COMMENTS

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Sample handling is:

✓ Satisfactory

Partially  
Satisfactory

Unsatisfactory

# DATA VALIDATION REPORT - STAGE 1 and 2 ESA: George Evans Rd, Mundamia, NSW

## 2. Precision / Accuracy Statement

	Yes	No (Comments below)
a. Was a NATA registered laboratory used?	✓	
b. Did the laboratory perform the requested tests?	✓	
c. Were laboratory methods adopted NATA endorsed?	✓	
d. Were appropriate test procedures followed?	✓	
e. Were reporting limits satisfactory?	✓	
f. Was the NATA Seal on the reports?	✓	
g. Were reports signed by an authorised person?	✓	

COMMENTS

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Precision / Accuracy of the Laboratory Report:

✓

Satisfactory

Partially  
Satisfactory

Unsatisfactory



## DATA VALIDATION REPORT - STAGE 1 and 2 ESA: George Evans Rd, Mundamia, NSW

### 3. Field Quality Assurance / Quality Control (QA/QC)

	Media	Number
a. Number of Primary Samples analysed (does not include duplicates)	Soil:	44
	Water:	-
b. Number of days of sampling		3
c. Number and Type of QA/QC Samples analysed		
Intra-Laboratory Field Duplicates	Soil	3
Inter-Laboratory Field triplicates		
Trip Blanks		2
Wash Blanks		
Other (Field Blanks, Spikes, Trip Blanks, etc.)		2

#### Field Duplicates

	Yes	No (Comments below)
Adequate Numbers of intra-laboratory field duplicates analysed?	✓	
Adequate Numbers of inter-laboratory field duplicates analysed?	✓	
Were RPDs within Control Limits?		
i. Organics (+ 50%)	✓	
ii. Metals / Inorganics (+ 50%)		✓
iii. Nutrients (+ 50%)		N/A

#### COMMENTS

RPD Copper, Lead, Nickel and Zinc exceeds control limits for 2863/Dup3.

The primary and duplicate samples were taken from a CBR sample with a depth range of 0.1-0.4 mbgl. These results indicate that there is a high degree of variability within the fill material sampled. As concentrations are well below HIL criteria this result is not considered sufficient to affect the suitability of data to inform this investigation.

## DATA VALIDATION REPORT - STAGE 1 and 2 ESA: George Evans Rd, Mundamia, NSW

### Trip Blank / Wash Blanks

	Yes	No (Comments below)
Were Adequate Numbers of trip blanks analysed?	✓	
Were Adequate Numbers of wash blanks analysed?	✓	
Were the Trip Blanks free of contaminants?	✓	
Were the Wash Blanks free of contaminants? <i>(If no, comment whether the contaminants present are also detected in the samples and whether they are common laboratory chemicals.)</i>	✓	
COMMENTS		

### Trip Spikes

	Yes	No (Comments below)
Were adequate numbers of Trip Spikes analysed?	✓	
Were the Trip Spike results within control limits?	✓	
COMMENTS		

Field QA/QC:

✓ Satisfactory  
Partially  
Satisfactory  
Unsatisfactory

## DATA VALIDATION REPORT - STAGE 1 and 2 ESA: George Evans Rd, Mundamia, NSW

### 3. Laboratory Internal Quality Assurance / Quality Control (QA/QC) Procedures

#### a. Type and Number of QA/QC Samples

QA/QC Type	Yes	No
Laboratory Blanks/Reagent Blanks (at least 1 per batch)	✓	
Matrix Spikes/Matrix Spike Duplicates (1 for each soil type)	✓	
Laboratory Control Samples	✓	
Laboratory Duplicates (at least one per batch or 1 per 10 samples, whichever is smaller)	✓	
Surrogates (where appropriate) <sup>1</sup>	✓	

<sup>1</sup> Number of surrogate spikes carried out on each sample

- |  | Yes | No<br>(Comments below) |
|--|-----|------------------------|
| b. Were the laboratory blanks/reagents blanks free of contamination? | ✓   |                        |
| c. Were the spike recoveries within control limits?                  | ✓   |                        |
| d. Were the RPDs of the laboratory duplicates within control limits? |     |                        |
| i. Organics (60 to 120 %)  | ✓   |                        |
| ii. Metals / Inorganics (70 to 130 %)                                | ✓   |                        |
| e. Were the surrogate recoveries within control limits?              | ✓   |                        |

COMMENTS

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Laboratory internal QA / QC is:      ✓      Satisfactory

Partially Satisfactory

Unsatisfactory

# DATA VALIDATION REPORT - STAGE 1 and 2 ESA: George Evans Rd, Mundamia, NSW

## 4. Summary of Quality Assurance / Quality Control (QA/QC)

QA/QC Type	Satisfactory	Partially Satisfactory	Unsatisfactory
Sample handling	✓		
Precision / Accuracy of the Laboratory Report	✓		
Field QA / QC	✓		
Laboratory Internal QA / QC	✓		

## 5. **Data** Usability

1. Data directly usable ✓
2. Data usable with the following corrections/modifications  
(see comment below)
3. Data not usable.

### COMMENTS

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