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24 February 2009

WSN Environmental Solutions

Level 1, Building A, Rhodes Corporate Park
1 Homebush Bay Drive
Rhodes NSW 2138



Attention: **Sarah Hurst**

Dear Sarah

Waste classification of stockpiled material, former PCYC Mini-bike Club, Little Forest Road, Lucas Heights, New South Wales.

1.0 Introduction

This letter provides a record of events necessary for waste classification of stockpiled material at the former PCYC Mini-bike Club, Little Forest Road, Lucas Heights, New South Wales (Figure 1). The stockpiled material contains asbestos (Reference 1) and is unsuitable to remain onsite and will therefore be removed to an appropriately licensed landfill. The proposed land use for the site is for an Alternative Waste Treatment Facility, which is recognised as commercial/industrial landuse.

Waste classification involved inspecting the work site, sample collection and laboratory analysis and preparation of a letter report.

This report is limited to the waste classification of the stockpiled material (Reference 1) and does not provide validation/waste classification for the entire site.

2.0 Field activities and sampling locations.

Environmental Earth Sciences NSW staff inspected the stockpiles on 23 January 2009. Ten stockpiles were inspected over the 11 hectare site (Figure 3). These 10 stockpiles had been previously identified (Reference 1) as containing both bonded asbestos and friable asbestos (in SS28 only) and comprised of imported fill material used for the construction of jumps, bike tracks and for levelling the car park. The total volume of the stockpiles was estimated to be approximately 500 m³ and a sampling density of one sample per stockpile was considered suitable to assess the material waste classification. Samples were collected at the surface of each stockpile to a depth of at least 0.3m to ensure volatile loss was minimised. The locations of the sampling locations from our October 2008 investigation are shown on Figure 2 while the hotspots identified in that investigation and characterised for this letter report are highlighted on Figure 3.

3.0 Observations

The material observed in the stockpiles was predominantly a sandy clay with occasional (<20%) orange sandstone gravel, indicating ripped sandstone in the profile. No odours or staining indicative of contamination were observed.

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Soil pH was undertaken on selected soil samples in the previous investigation (Reference 1). All pH values were alkaline which is not indicative of natural soils derived from Hawkesbury Sandstone (the underlying geology) which is further indication of the presence of fill materials (Reference 3).

4.0 Sampling program and analytical schedule

Samples were collected in plastic bags for inorganic analysis and glass jars for organic analysis (Reference 2).

The samples were analysed for the following suite of potential chemicals of concern for waste classification purposes as defined by previous investigations on the site:

- polycyclic aromatic hydrocarbons (PAH);
- total petroleum hydrocarbons (TPH);
- benzene, toluene, ethylbenzene and xylene (BTEX);
- heavy metals;
- benzo (a) pyrene and lead TCLP analysis on selected samples to aid in waste classification of the material; and
- no OCP were analysed due to non-detect results from the November 2008 investigation.

Due to the low number of samples collected for additional analyses as part of this waste classification and the full QA/QC component of our previous investigation, field duplicates were not taken.

5.0 Application of waste classification criteria

Based on the NSW DECC (2008). *Waste classification guidelines. Part 1: Classifying waste* (Reference 8), soils requiring off site disposal from a site have to be classified as either general solid waste, restricted solid waste, hazardous waste or special waste (for instances where asbestos is present). Given that asbestos is present in all 10 stockpiles, the waste must be managed to meet the requirements of both the special waste and the class of waste of the soil itself.

The waste criteria for the chemicals of concern tested as part of this sampling program are presented in Tables 1 and 2. Table 1 is used for waste classification where total concentrations only are available. If the total concentrations of any analyte in soil fall above the general solid waste criteria (i.e. restricted solid waste or hazardous waste) as shown in Table 2 the material cannot be classified as general solid waste without further testing. If concentrations are above the general solid waste criteria in Table 1 but below the general solid waste criteria in Table 2, further assessment utilising the toxicity characteristic leaching procedure (TCLP) test on the analytes that exceed the general solid waste criteria in Table 1 can be undertaken to assess how leachable these analytes in the soil are. If they are found to only be leachable below certain levels specified in the guidelines in Table 2 (which includes the leachable and total concentrations), the material may be classified as general solid waste.

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The process of classification requires that should any one analyte exceed the general solid waste criteria (but remain beneath the restricted solid waste criteria) then the waste would be classified as restricted solid waste. Conversely, if all analytes are below the general solid waste criteria then the waste can be classified as general solid waste.

Statistical analysis including but not limited to 95% upper confidence limits must also be considered when undertaking waste classification.

TABLE 1 WASTE DISPOSAL CRITERIA WITHOUT TCLP

	Maximum values of total concentration for classification without TCLP.	
	General Solid Waste	Restricted Solid Waste
Chemical	Total Concentration	Total Concentration
Arsenic	100	400
Benzene	10	40
Cadmium	20	80
Chromium (VI)	100	400
Ethyl-benzene	600	2400
Lead	100	400
Mercury	4	16
Nickel	40	160
Benzo(a)pyrene	0.8	3.2
TPH fraction C ₆ – C ₉	N/A	N/A
TPH fraction C ₁₀ – C ₃₆	N/A	N/A
PAHs (total)	N/A	N/A
Toluene	288	1152
Xylenes (total)	1000	4000

Notes:

1. Totals expressed as mg/kg on a dry weight basis;
2. N/A - not applicable as classification based on total concentration (TC) see Table 4 in this document for guideline values;
3. Where waste classifications exceed the restricted solid waste criteria, the waste is classified as hazardous if TCLP testing is not undertaken.

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TABLE 2 WASTE DISPOSAL CRITERIA WITH TCLP

	Maximum values for leachable concentration and total concentration when used together			
	General Solid Waste		Restricted Solid Waste	
Chemical	TCLP	Total	TCLP	Total
Arsenic	5.0	500	20	2000
Benzene	0.5	18	2	72
Cadmium	1.0	100	4	400
Chromium (VI)	5	1900	20	7600
Ethyl-benzene	30	1080	120	4320
Lead	5	1500	20	6000
Mercury	0.2	50	0.8	200
Nickel	2	1050	8	4200
Benzo(a)pyrene	0.04	10	0.16	23
TPH fraction C ₆ – C ₉	N/A	650	N/A	2600
TPH fraction C ₁₀ – C ₃₆	N/A	10000	N/A	40000
PAHs (total)	N/A	200	N/A	800
Toluene	14.4	518	57.6	2073
Xylenes (total)	50	1800	200	7200

Notes:

1. totals expressed as mg/kg, TCLP as mg/L;
2. Waste Disposal criteria from NSW EPA's Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid wastes;
3. N/A not applicable as classification based on total concentration (TC); and
4. where waste classifications exceed the restricted solid waste criteria, the waste is classified as hazardous.

6.0 Laboratory Results

The results from the laboratory analysis and TCLP analysis are presented in Table 3 and 4. The analyses were undertaken by the National Measurement Institute (NMI) and Sydney Analytical Laboratories (SAL) both of which are NATA registered for the methods used.

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TABLE 3 WASTE CLASSIFICATION LABORATORY RESULTS

Analyte	SS14	SS17	SS26a	SS28a	SS31a	GSW	RSW
Petroleum Hydrocarbons							
C ₆ -C ₉	<25	<25	<25	<25	<25	650	2600
C ₁₀ -C ₃₆	<250	270	<250	<250	<250	1000	40000
BTEX							
Benzene	<0.5	<0.5	<0.5	<0.5	<0.5	10	40
Toluene	<0.5	<0.5	<0.5	<0.5	<0.5	288	1152
Ethylbenzene	<0.5	<0.5	<0.5	<0.5	<0.5	600	2400
m & p - Xylenes	<1	<1	<1	<1	<1		
o- Xylenes	<0.5	<0.5	<0.5	<0.5	<0.5	1000	4000
PAHs							
Naphthalene	<0.5	<0.5	<0.5	<0.5	<0.5	N/A	N/A
Benzo(a)pyrene ^a	<0.5	<0.5	<0.5	<0.5	<0.5	10	23
Benzo(a)pyrene (TCLP) ^a	-	-	-	-	-	40	160
Total PAHs ^a	<8	<8	<8	<8	<8	200	800
Heavy Metals							
Arsenic	4	4	3	4	3	100	400
Cadmium	<0.5	<0.5	<0.5	<0.5	<0.5	20	80
Chromium	12	16	13	14	13	100	400
Copper	15	7	3	11	5		
Lead ^a	27	24	16	26	23	1500	6000
Lead (TCLP) ^a	-		-	-	-	5	20
Mercury	0.06	0.045	0.015	0.025	0.015	4	16
Nickel	6	2	2	4	4	40	160
Zinc	59	40	26	50	23	N/A	N/A
Waste Classification	GSW	GSW	GSW	GSW	GSW		

Notes:

1. All results are expressed as mg/kg
2. All results compared with Waste Disposal Criteria without TCLP (Table 1) unless noted otherwise;
3. ^a Results compared with the Waste Disposal Criteria with TCLP (Table 2) where TCLP analysis has been undertaken;
4. N/A: not applicable;
5. GSW is General Solid Waste classification, RSW is for restricted solid waste classification;
6. **Bold** values indicate exceedence of the general solid waste criteria without TCLP; and
7. Shaded values indicate exceedence of the general solid waste criteria with TCLP .

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TABLE 4 WASTE CLASSIFICATION LABORATORY RESULTS (CONT'D)

Analyte	SS36a	SS37a	SS38a	BH12a	BH19a	GSW	RSW
Petroleum Hydrocarbons							
C ₆ -C ₉	<25	<25	<25	<25	<25	650	2600
C ₁₀ -C ₃₆	<250	<250	<250	<250	<250	1000	40000
BTEX							
Benzene	<0.5	<0.5	<0.5	<0.5	<0.5	10	40
Toluene	<0.5	<0.5	<0.5	<0.5	<0.5	288	1152
Ethylbenzene	<0.5	<0.5	<0.5	<0.5	<0.5	600	2400
m & p - Xylenes	<1	<1	<1	<1	<1		
o- Xylenes	<0.5	<0.5	<0.5	<0.5	<0.5	1000	4000
PAHs							
Naphthalene	<0.5	<0.5	<0.5	<0.5	<0.5	N/A	N/A
Benzo(a)pyrene ^a	<0.5	0.5	0.5	1.7	0.54	10	23
Benzo(a)pyrene (TCLP) ^a	-	-	-	<0.5	-	40	160
Total PAHs ^a	<8	<8	<8	25.6	8.7	200	800
Heavy Metals							
Arsenic	3.8	3.0	2.0	6	9	100	400
Cadmium	<0.5	<0.5	<0.5	<0.5	<0.5	20	80
Chromium	29	8.0	18	13	5	100	400
Copper	7.0	16	5.0	15	28		
Lead ^a	21	23	11	450	145	1500	6000
Lead (TCLP) ^a	-	-	-	0.36	0.09	5	20
Mercury	0.02	0.015	0.015	0.085	0.23	4	16
Nickel	6.0	5.0	1.0	4	16	40	160
Zinc	63	43	11	125	1250	N/A	N/A
Waste Classification^c	GSW	GSW	GSW	GSW	GSW		

Notes:

8. All results are expressed as mg/kg
9. All results compared with Waste Disposal Criteria without TCLP (Table 1) unless noted otherwise;
10. ^a Results compared with the Waste Disposal Criteria with TCLP (Table 2) where TCLP analysis has been undertaken;
11. N/A: not applicable;
12. GSW is General Solid Waste classification, RSW is for restricted solid waste classification;
13. **Bold** values indicate exceedence of the general solid waste criteria without TCLP; and
14. Shaded values indicate exceedence of the general solid waste criteria with TCLP .

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7.0 Statistical analysis

As part of the process of classifying waste, a statistical analysis of the dataset has been presented (Table 5). Statistical analysis was not undertaken on BTEX, TPH C₆-C₉ and C₁₀-C₃₆ or cadmium as all but one result were below the laboratories' detection limits.

TABLE 5 STATISTICAL ANALYSIS

Analyte	Mean	S.D	Min	Max	95% UCL	GSW Criteria
Petroleum Hydrocarbons						
C ₁₀ -C ₃₆	252	6.32	250	270	329	1000
PAHs						
Benzo(a)pyrene	0.624	0.37	0.5	1.7	0.76	0.8
Total PAHs	9.83	5.54	8	25.6	19	200
Heavy Metals						
Arsenic	4.18	1.99	2	9	5	100
Chromium	14.1	6.4	5	29	17	100
Lead	76.6	136.9	11	450	243	100
Mercury	0.05	0.06	0.015	0.23	0.12	4
Nickel	5	4.21	1	16	10	40
Zinc	169	381.11	11	1250	634	N/A

8.0 Discussion

Results presented in Tables 3, 4 and 5 indicate that most of the chemicals of concern associated with the stockpiles except for lead and benzo(a)pyrene have concentrations below the general solid waste criteria without using TCLP. Elevated lead levels were found at the stockpiles characterised by BH12a and BH19a (Table 4) which resulted in the 95% upper confidence level (UCL) of 243 mg/kg exceeding the general soil waste criteria of 100 mg/kg (Table 1). A TCLP analysis was conducted on these two samples and compared with the general solid waste criteria using TCLP (Table 2). Results were below the criteria and therefore acceptable as general solid waste.

Although the statistical analysis showed that 95% UCL of the Benzo(a)pyrene was below the criteria for use without TCLP it was recommended that as one individual sample BH12a had high levels a TCLP should be undertaken. Results of TCLP (Table 4) showed that no detectable concentrations of leachate were produced (<0.5 mg/L) and the material can therefore be confirmed as general soil waste.

Following the results of the analysis material contained within the 10 stockpiles is considered to be classified as *Special waste (asbestos) - general solid waste* and is suitable to be disposed of to a landfill licensed to accept Special Waste - general solid waste.

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9.0 QA/QC

Given the limited schedule of analysis and the suitable completion of QA/QC measures for the November 2008 investigation (Reference 1), field QA/QC measures were not undertaken as part of this scope of works. However as part of our routine laboratory procedure blanks and spikes were undertaken as part of the analysis and found to be within a acceptable range.

10.0 Conclusion

In summary, under the DECC (2008) *Waste Classification Guidelines – Part 1: Classifying Waste*, the material in the ten stockpiles analysed for this report is pre-classified as *Special Waste – asbestos*. This requires that the material is disposed offsite to a waste facility licensed to accept Special Waste. The other contaminants of concern analysed as part of this waste classification meet the site criteria for general solid waste criteria.

The material is considered to be classified as special waste/general solid waste for offsite disposal to an appropriately licensed facility as indicated in current waste classification guidelines (Reference 8).

11.0 Limitations

This letter report has been prepared by Environmental Earth Sciences NSW ABN 109 404 006 in response to and subject to the following limitations:

1. The specific instructions received from Sarah Hurst of WSN Environmental Solutions;
2. The specific scope of works set out in PO109026 and emails from Joshua Lloyd to Sarah Hurst on 20 January 2009 and approved by email on 28 January 2009 for and on behalf of WSN Environmental Solutions, is included in Sections 1 and 4 of this report;
3. May not be relied upon by any third party not named in this report for any purpose except with the prior written consent of Environmental Earth Sciences NSW (which consent may or may not be given at the discretion of Environmental Earth Sciences NSW);
4. This report comprises the formal report, documentation sections, tables, figures and appendices as referred to in the index to this report and must not be released to any third party or copied in part without all the material included in this report for any reason;
5. The report only relates to the site referred to in the scope of works being located on the corner of New Illawarra Road and Little Forest Road, Lucas Heights ("the site");
6. The report relates to the site as at the date of the report as conditions may change thereafter due to natural processes and/or site activities;
7. No warranty or guarantee is made in regard to any other use than as specified in the scope of works and only applies to the depth tested and reported in this report;
8. Fill, soil, groundwater and rock to the depth tested on the site may be fit for the use specified in this report. Unless it is expressly stated in this report, the fill, soil and/or rock may not be suitable for classification as clean fill if deposited off site; and
9. The general limitations which are attached to this report.

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Should you have any further queries, please do not hesitate to contact us on
(02) 9922 1777.

On behalf of
Environmental Earth Sciences NSW

Project Manager

Josh Bray
Environmental Scientist

Project Director

Joshua Lloyd
Senior Hydrogeologist

Internal Reviewer

Stuart Brisbane
Soil Scientist
109017

12.0 References

1. Environmental Earth Sciences (2008) *Limited Environmental Site Assessment at Lot 111 DP 883495 and Lot 1 DP 233333, corner of Little Forest Road and New Illawarra Road, Lucas Heights, NSW*
2. Environmental Earth Sciences (2005) *Soil, Gas and Groundwater sampling manual.*
3. Hazelton, P.A. and Tille P.J. (1990). *Soil Landscapes of the Wollongong-Port Hacking 1:100 000 Sheet.* Soil Conservation Service of NSW, Sydney.
4. National Environment Protection Council (1999) — *National Environment Protection (Assessment of Site Contamination) Measure (NEPM)*
5. NSW EPA (1994) — *Contaminated sites: Guidelines for assessing service station sites.*
6. NSW EPA (1995) — *Contaminated sites: Sampling design guidelines.*
7. NSW EPA (1998) — *Contaminated sites: Guidelines for the NSW site auditor scheme.*
8. NSW DECC (2008) — *Waste classification guidelines part 1: classifying waste.*

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GENERAL LIMITATIONS

Scope of services

The work presented in this report is Environmental Earth Sciences response to the specific scope of works requested by, planned with and approved by the client. It cannot be relied on by any other third party for any purpose except with our prior written consent. Client may distribute this report to other parties and in doing so warrants that the report is suitable for the purpose it was intended for. However, any party wishing to rely on this report should contact us to determine the suitability of this report for their specific purpose.

Data should not be separated from the report

A report is provided inclusive of all documentation sections, limitations, tables, figures and appendices and should not be provided or copied in part without all supporting documentation for any reason, because misinterpretation may occur.

Subsurface conditions change

Understanding an environmental study will reduce exposure to the risk of the presence of contaminated soil and or groundwater. However, contaminants may be present in areas that were not investigated, or may migrate to other areas. Analysis cannot cover every type of contaminant that could possibly be present. When combined with field observations, field measurements and professional judgement, this approach increases the probability of identifying contaminated soil and or groundwater. Under no circumstances can it be considered that these findings represent the actual condition of the site at all points.

Environmental studies identify actual sub-surface conditions only at those points where samples are taken, when they are taken. Actual conditions between sampling locations differ from those inferred because no professional, no matter how qualified, and no sub-surface exploration program, no matter how comprehensive, can reveal what is hidden below the ground surface. The actual interface between materials may be far more gradual or abrupt than an assessment indicates. Actual conditions in areas not sampled may differ from that predicted. Nothing can be done to prevent the unanticipated. However, steps can be taken to help minimize the impact. For this reason, site owners should retain our services.

Problems with interpretation by others

Advice and interpretation is provided on the basis that subsequent work will be undertaken by Environmental Earth Sciences NSW. This will identify variances, maintain consistency in how data is interpreted, conduct additional tests that may be necessary and recommend solutions to problems encountered on site. Other parties may misinterpret our work and we cannot be responsible for how the information in this report is used. If further data is collected or comes to light we reserve the right to alter their conclusions.

Obtain regulatory approval

The investigation and remediation of contaminated sites is a field in which legislation and interpretation of legislation is changing rapidly. Our interpretation of the investigation findings should not be taken to be that of any other party. When approval from a statutory authority is required for a project, that approval should be directly sought by the client.

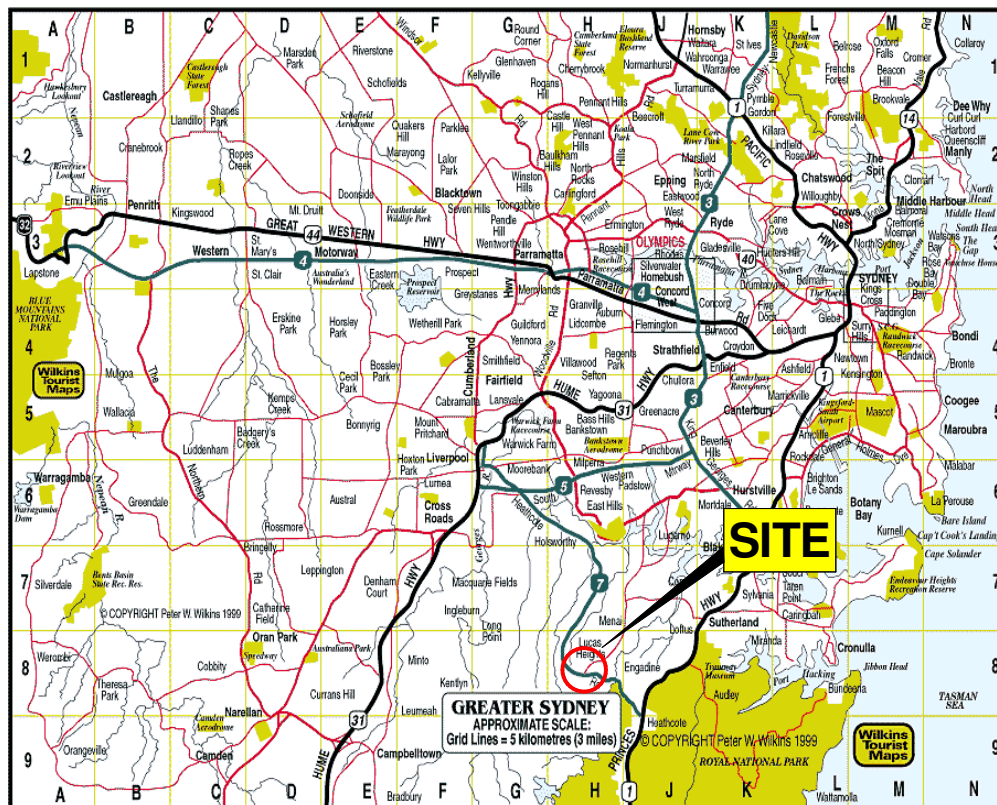
Limit of liability

This study has been carried out to a particular scope of works at a specified site and should not be used for any other purpose. This report is provided on the condition that Environmental Earth Sciences NSW disclaims all liability to any person or entity other than the client in respect of anything done or omitted to be done and of the consequence of anything done or omitted to be done by any such person in reliance, whether in whole or in part, on the contents of this report. Furthermore, Environmental Earth Sciences NSW disclaims all liability in respect of anything done or omitted to be done and of the consequence of anything done or omitted to be done by the client, or any such person in reliance, whether in whole or any part of the contents of this report of all matters not stated in the brief outlined in Environmental Earth Sciences NSW's proposal number and according to Environmental Earth Sciences general terms and conditions and special terms and conditions for contaminated sites.

To the maximum extent permitted by law, we exclude all liability of whatever nature, whether in contract, tort or otherwise, for the acts, omissions or default, whether negligent or otherwise for any loss or damage whatsoever that may arise in any way in connection with the supply of services. Under circumstances where liability cannot be excluded, such liability is limited to the value of the purchased service.

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ATTACHMENT 1 FIGURES



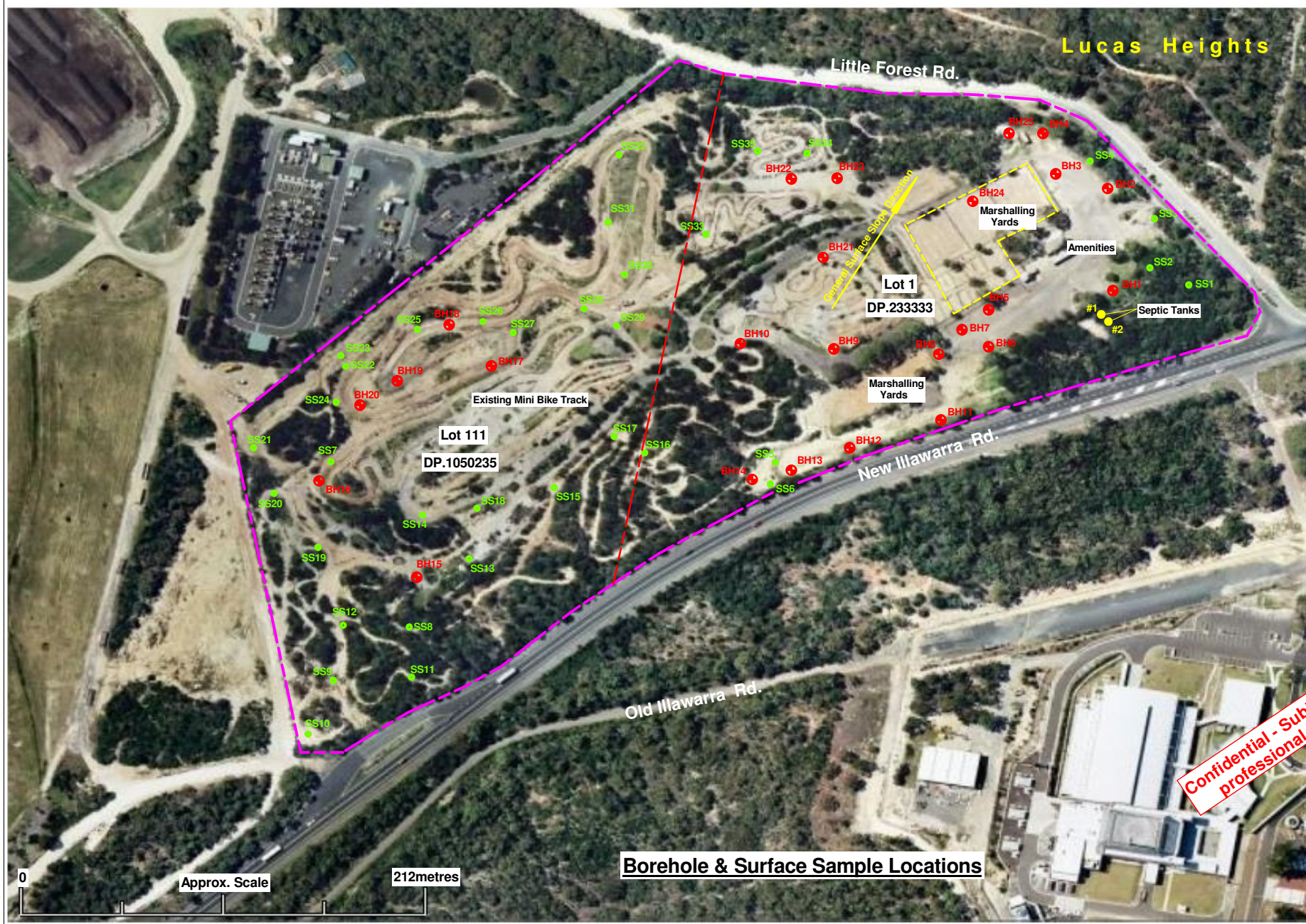
REGIONAL LOCALITY MAP



SITE LOCALITY MAP

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ENVIRONMENTAL EARTH SCIENCES THE KNOW AND THE HOW		Title: Site Locality Map	
		Location: Illawarra Road, Lucas Heights, NSW	
Client: WSN Environmental Solutions		Job number: 108074	
Drawn by: TRJ		Scale: As shown	Source: See Ref.
Proj Man: JB		Date: 20 Oct. 2008	Figure 1



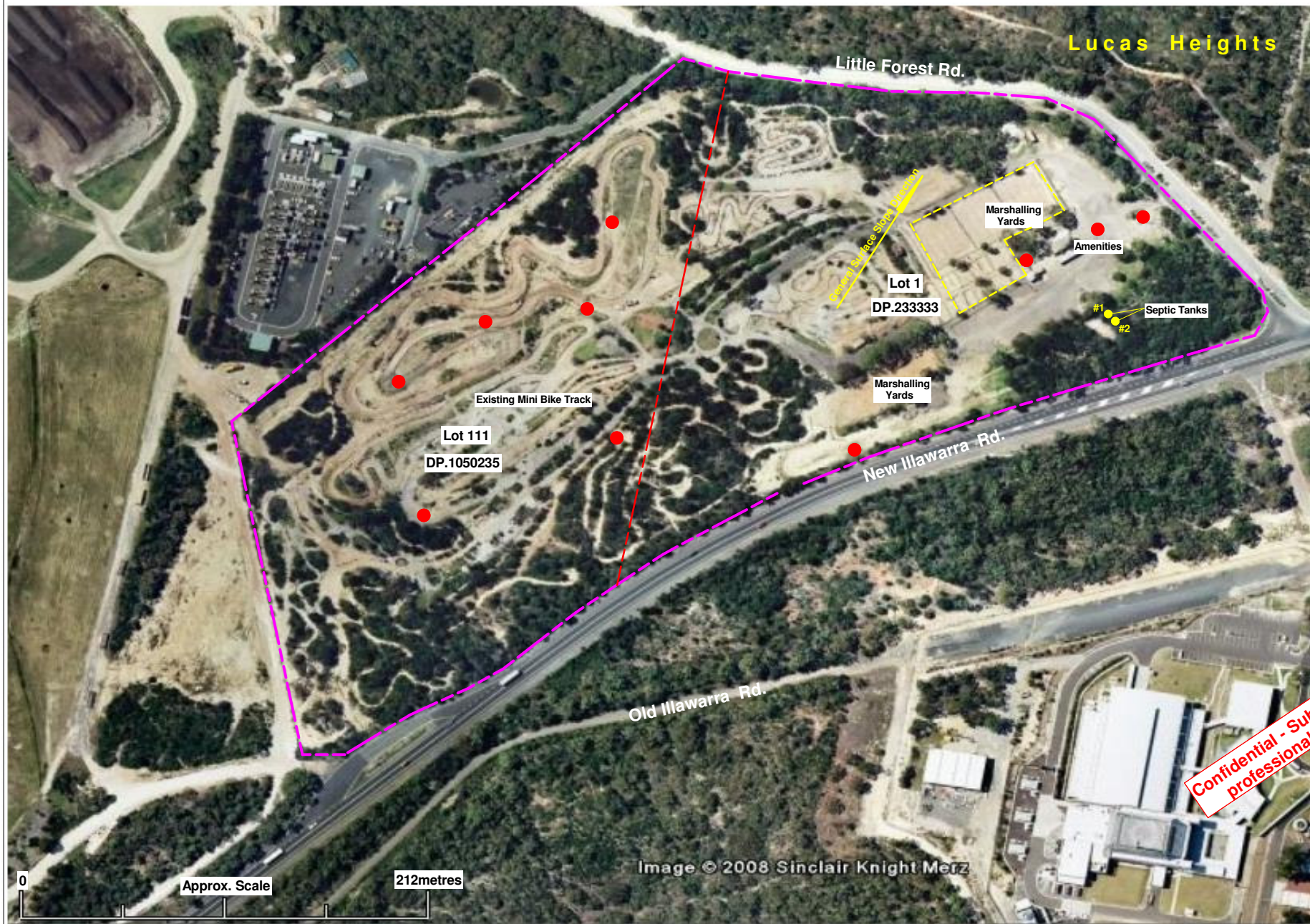
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Legend:

- - Surface samples SS1 - SS35
- ⊕ - Borehole locations BH1 - BH25
- - Site Boundary



Title: Borehole & Surface Sampling Locations	
Location: New Illawarra Road, Lucas Heights, NSW	
Client: WSN Environmental Solutions	Job number: 108074
Drawn by: TRJ	Scale: As shown
Proj Man: JB	Date: 20 Oct. 2008
	Figure 2



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Legend:

- Asbestos Hot Spot Remediation Areas
- Site Boundary



Title: Hot Spot Remediation Areas	
Location: New Illawarra Road, Lucas Heights, NSW	
Client: WSN Environmental Solutions	Job number: 108074
Drawn by: TRJ	Scale: As shown
Proj Man: JB	Date: 4 Feb. 2009
	Figure 3

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ATTACHMENT 2 LABORATORY TRANSCRIPTS



REPORT OF ANALYSIS

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Report No. RN720735

Client	: Environmental & Earth Sciences (NSW)	Job No.	: ENVI10/090129
	UNIT 4	Quote No.	: QT-00782
	2 GEORGE PLACE	Order No.	:
	ARTARMON NSW 2064	Date Sampled	:
Attention	: JOSHUA BRAY	Date Received	: 29-JAN-2009
Project Name	:	Sampled By	: CLIENT
Your Client Services Manager	: BRIAN WOODWARD	Phone	: (02) 94490151

Lab Reg No.	Sample Ref	Sample Description
N09/002450	SS31A	SOIL LUCAS HEIGHTS JOB 109017
N09/002452	BH19A	SOIL LUCAS HEIGHTS JOB 109017
N09/002453	SS28A	SOIL LUCAS HEIGHTS JOB 109017
N09/002454	SS26A	SOIL LUCAS HEIGHTS JOB 109017

Lab Reg No.		N09/002450	N09/002452	N09/002453	N09/002454	
Sample Reference		SS31A	BH19A	SS28A	SS26A	
	Units					Method
Poly Aromatic Hydrocarbons						
Naphthalene	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	NGCMS_1111
Acenaphthylene	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	NGCMS_1111
Acenaphthene	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	NGCMS_1111
Fluorene	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	NGCMS_1111
Phenanthrene	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	NGCMS_1111
Anthracene	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	NGCMS_1111
Fluoranthene	mg/kg	< 0.5	0.83	< 0.5	< 0.5	NGCMS_1111
Pyrene	mg/kg	< 0.5	0.83	< 0.5	< 0.5	NGCMS_1111
Benz(a)anthracene	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	NGCMS_1111
Chrysene	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	NGCMS_1111
Benzo(b)&(k)fluoranthene	mg/kg	< 1	< 1	< 1	< 1	NGCMS_1111
Benzo(a)pyrene	mg/kg	< 0.5	0.54	< 0.5	< 0.5	NGCMS_1111
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	NGCMS_1111
Dibenz(ah)anthracene	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	NGCMS_1111
Benzo(ghi)perylene	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	NGCMS_1111
BTEX						
Benzene	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	NGCMS_1121
Toluene	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	NGCMS_1121
Ethyl Benzene	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	NGCMS_1121
m, p - Xylene	mg/kg	< 1	< 1	< 1	< 1	NGCMS_1121
o - Xylene	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	NGCMS_1121
Total Petroleum Hydrocarbons						
TPH C6 - C9	mg/kg	< 25	< 25	< 25	< 25	NGCMS_1121
TPH C10 - C14	mg/kg	< 50	< 50	< 50	< 50	NGCMS_1112
TPH C15 - C28	mg/kg	< 100	< 100	< 100	< 100	NGCMS_1112
TPH C29 - C36	mg/kg	< 100	< 100	< 100	< 100	NGCMS_1112
Surrogate						
Surrogate semivolatle Rec.	%	105	105	118	107	

This report is issued in accordance with NATA's accreditation requirements

1 Suakin Street, Pymble NSW 2073 Tel: +61 2 9449 0111 Fax: +61 2 9449 1653 www.measurement.gov.au

REPORT OF ANALYSIS

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Lab Reg No.		N09/002450	N09/002452	N09/002453	N09/002454	
Sample Reference		SS31A	BH19A	SS28A	SS26A	
	Units					Method
Surrogate						
Surrogate volatile Rec	%	101	102	102	102	
Dates						
Date extracted		29-JAN-2009	29-JAN-2009	29-JAN-2009	29-JAN-2009	
Date analysed		30-JAN-2009	30-JAN-2009	30-JAN-2009	30-JAN-2009	



Luke Baker, Analyst
Organics - NSW
Accreditation No. 198

5-FEB-2009

Lab Reg No.		N09/002450	N09/002452	N09/002453	N09/002454	
Sample Reference		SS31A	BH19A	SS28A	SS26A	
	Units					Method
Trace Elements						
Total Solids	%	91.5	91	94.2	88.5	NT2_49



Deborah Yen, Analyst
Inorganics - NSW
Accreditation No. 198

5-FEB-2009

REPORT OF ANALYSIS

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Report No. RN720735

Client	: Environmental & Earth Sciences (NSW)	Job No.	: ENVI10/090129
	UNIT 4	Quote No.	: QT-00782
	2 GEORGE PLACE	Order No.	:
	ARTARMON NSW 2064	Date Sampled	:
Attention	: JOSHUA BRAY	Date Received	: 29-JAN-2009
Project Name	:	Sampled By	: CLIENT
Your Client Services Manager	: BRIAN WOODWARD	Phone	: (02) 94490151

Lab Reg No.	Sample Ref	Sample Description
N09/002455	SS36A	SOIL LUCAS HEIGHTS JOB 109017
N09/002456	SS37A	SOIL LUCAS HEIGHTS JOB 109017
N09/002457	SS38A	SOIL LUCAS HEIGHTS JOB 109017

Lab Reg No.		N09/002455	N09/002456	N09/002457		
Sample Reference		SS36A	SS37A	SS38A		
	Units					Method
Poly Aromatic Hydrocarbons						
Naphthalene	mg/kg	< 0.5	< 0.5	< 0.5		NGCMS_1111
Acenaphthylene	mg/kg	< 0.5	< 0.5	< 0.5		NGCMS_1111
Acenaphthene	mg/kg	< 0.5	< 0.5	< 0.5		NGCMS_1111
Fluorene	mg/kg	< 0.5	< 0.5	< 0.5		NGCMS_1111
Phenanthrene	mg/kg	< 0.5	< 0.5	< 0.5		NGCMS_1111
Anthracene	mg/kg	< 0.5	< 0.5	< 0.5		NGCMS_1111
Fluoranthene	mg/kg	< 0.5	< 0.5	< 0.5		NGCMS_1111
Pyrene	mg/kg	< 0.5	< 0.5	< 0.5		NGCMS_1111
Benz(a)anthracene	mg/kg	< 0.5	< 0.5	< 0.5		NGCMS_1111
Chrysene	mg/kg	< 0.5	< 0.5	< 0.5		NGCMS_1111
Benzo(b)&(k)fluoranthene	mg/kg	< 1	< 1	< 1		NGCMS_1111
Benzo(a)pyrene	mg/kg	< 0.5	< 0.5	< 0.5		NGCMS_1111
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.5	< 0.5	< 0.5		NGCMS_1111
Dibenz(ah)anthracene	mg/kg	< 0.5	< 0.5	< 0.5		NGCMS_1111
Benzo(ghi)perylene	mg/kg	< 0.5	< 0.5	< 0.5		NGCMS_1111
BTEX						
Benzene	mg/kg	< 0.5	< 0.5	< 0.5		NGCMS_1121
Toluene	mg/kg	< 0.5	< 0.5	< 0.5		NGCMS_1121
Ethyl Benzene	mg/kg	< 0.5	< 0.5	< 0.5		NGCMS_1121
m, p - Xylene	mg/kg	< 1	< 1	< 1		NGCMS_1121
o - Xylene	mg/kg	< 0.5	< 0.5	< 0.5		NGCMS_1121
Total Petroleum Hydrocarbons						
TPH C6 - C9	mg/kg	< 25	< 25	< 25		NGCMS_1121
TPH C10 - C14	mg/kg	< 50	< 50	< 50		NGCMS_1112
TPH C15 - C28	mg/kg	< 100	< 100	< 100		NGCMS_1112
TPH C29 - C36	mg/kg	< 100	< 100	120		NGCMS_1112
Surrogate						
Surrogate semivolatile Rec.	%	98	79	65		
Surrogate volatile Rec	%	103	103	103		

REPORT OF ANALYSIS

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Lab Reg No.		N09/002455	N09/002456	N09/002457		
Sample Reference		SS36A	SS37A	SS38A		
	Units					Method
Dates						
Date extracted		29-JAN-2009	29-JAN-2009	29-JAN-2009		
Date analysed		30-JAN-2009	30-JAN-2009	30-JAN-2009		



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Lab Reg No.		N09/002455	N09/002456	N09/002457		
Sample Reference		SS36A	SS37A	SS38A		
	Units					Method
Trace Elements						
Total Solids	%	95.4	93.3	90.4		NT2_49



Deborah Yen, Analyst
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5-FEB-2009

All results are expressed on a dry weight basis.



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This Report supersedes reports: RN720351 RN720693



REPORT OF ANALYSIS

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Report No. RN720734

Client	: Environmental & Earth Sciences (NSW)	Job No.	: ENVI10/090129
	UNIT 4	Quote No.	: QT-00782
	2 GEORGE PLACE	Order No.	:
	ARTARMON NSW 2064	Date Sampled	:
Attention	: JOSHUA BRAY	Date Received	: 29-JAN-2009
Project Name	:	Sampled By	: CLIENT
Your Client Services Manager	: BRIAN WOODWARD	Phone	: (02) 94490151

Lab Reg No.	Sample Ref	Sample Description
N09/002451	BH12A	SOIL LUCAS HEIGHTS JOB 109017

Lab Reg No.		N09/002451				
Sample Reference		BH12A				
	Units					Method
Poly Aromatic Hydrocarbons						
Naphthalene	mg/kg	< 0.5				NGCMS_1111
Acenaphthylene	mg/kg	0.55				NGCMS_1111
Acenaphthene	mg/kg	< 0.5				NGCMS_1111
Fluorene	mg/kg	< 0.5				NGCMS_1111
Phenanthrene	mg/kg	4.9				NGCMS_1111
Anthracene	mg/kg	0.98				NGCMS_1111
Fluoranthene	mg/kg	4.4				NGCMS_1111
Pyrene	mg/kg	3.6				NGCMS_1111
Benz(a)anthracene	mg/kg	1.6				NGCMS_1111
Chrysene	mg/kg	1.5				NGCMS_1111
Benzo(b)&(k)fluoranthene	mg/kg	2.6				NGCMS_1111
Benzo(a)pyrene	mg/kg	1.7				NGCMS_1111
Indeno(1,2,3-cd)pyrene	mg/kg	0.84				NGCMS_1111
Dibenz(ah)anthracene	mg/kg	< 0.5				NGCMS_1111
Benzo(ghi)perylene	mg/kg	0.95				NGCMS_1111
Surrogate						
Surrogate semivolatile Rec.	%	104				
Dates						
Date extracted		29-JAN-2009				
Date analysed		30-JAN-2009				

Luke Baker, Analyst
Organics - NSW
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5-FEB-2009

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REPORT OF ANALYSIS

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Report No. RN720734

Lab Reg No.		N09/002451				
Sample Reference		BH12A				
	Units					Method
Trace Elements						
Total Solids	%	88.1				NT2_49



Deborah Yen, Analyst
Inorganics - NSW
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5-FEB-2009

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REPORT OF ANALYSIS

Page: 1 of 2
Report No. RN722853

Client	: Environmental & Earth Sciences (NSW)	Job No.	: ENVI10/090129
	UNIT 4	Quote No.	: QT-00043
	2 GEORGE PLACE	Order No.	:
	ARTARMON NSW 2064	Date Sampled	:
Attention	: JOSHUA BRAY	Date Received	: 29-JAN-2009
Project Name	:	Sampled By	: CLIENT
Your Client Services Manager	: BRIAN WOODWARD	Phone	: (02) 94490151

Lab Reg No.	Sample Ref	Sample Description
N09/002451/T	BH12A	SOIL LEACHATE LUCAS HEIGHTS JOB 109017

Lab Reg No.		N09/002451/T				
Sample Reference		BH12A				
	Units					Method
Semi Volatile Organic Compounds						
Benzo(a)pyrene	ug/L	< 0.5				NGCMS_1111
Surrogate						
Surrogate semivolatile Rec.	%	67				
Dates						
Date extracted		16-FEB-2009				
Date analysed		16-FEB-2009				

Luke Baker, Analyst
Organics - NSW
Accreditation No. 198

18-FEB-2009

Lab Reg No.		N09/002451/T				
Sample Reference		BH12A				
	Units					Method
TCLP						
Soil pH		6.6				NW_SL9
pH of Initial extract		5.1				NW_SL9
pH of final extract		5.4				NW_SL9
Buffer Used		4.93				NW_SL9

Wei Huang, Analyst
Inorganics - NSW
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18-FEB-2009

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REPORT OF ANALYSIS

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Report No. RN722853

20 g of sample was leached for 18 hours with 400 mL buffer at pH 4.93 and the leachate tested for the above analytes.



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Phone: (02) 9838 8903
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ENVIRONMENTAL & EARTH
SCIENCES
JOSHUA BRAY

Ref No. SAL 21672
Date In 29/1/09
Date Required _____
Date Completed _____

Issue Date: 20/7/2007
Issued by: L. Smith
S1/Issue3

ALL ANALYSES ON SAMPLES AS RECEIVED

Chief Chemist