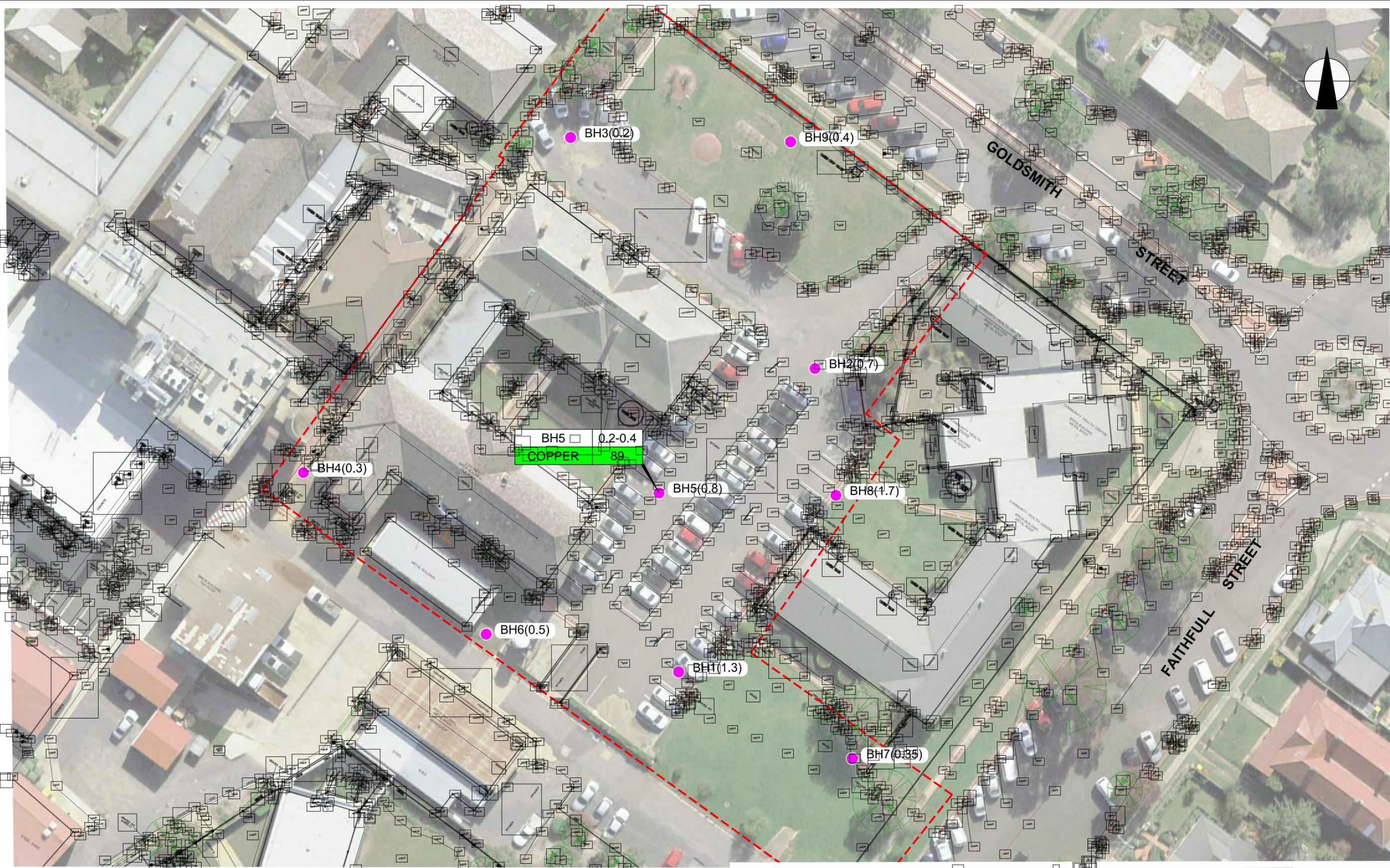


PLOT DATE: 3/03/2017 11:34:37 AM DWG FILE: S:\5 EIS\5C EIS JOBS\30000\SE30116K GOULBURN\CAD\E30116K.DWG

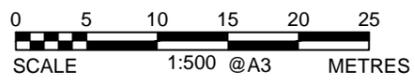


**LEGEND**

- - - APPROXIMATE SITE BOUNDARY
- BH (Fill Depth) BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m)

SAMPLE ID	DEPTH (metres)
BH5	0.2-0.4

COPPER 89 SOIL CONTAMINATION ABOVE SAC FOR ENVIRONMENTAL RISK



This plan should be read in conjunction with the EIS report.

<b>Title:</b> SITE CONTAMINATION DATA	
<b>Location:</b> GOULBURN HOSPITAL 130 GOLDSMITH STREET, GOULBURN, NSW	
<b>Report No:</b> E30116K	<b>Figure No:</b> 3
<b>ENVIRONMENTAL INVESTIGATION SERVICES</b>	



## **LABORATORY SUMMARY TABLES**

**TABLE A**  
**SOIL LABORATORY RESULTS COMPARED TO HILs**  
 All data in mg/kg unless stated otherwise

			HEAVY METALS							PAHs		ORGANOCHLORINE PESTICIDES (OCPs)						OP PESTICIDES (OPPs)	TOTAL PCBs	ASBESTOS FIBRES			
			Arsenic	Cadmium	Chromium VI <sup>2</sup>	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P TEQ <sup>3</sup>	HCB	Endosulfan	Methoxychlor	Aldrin & Dieldrin	Chlordane	DDT, DDD & DDE	Heptachlor	Chlorpyrifos			
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	100
Site Assessment Criteria (SAC) <sup>1</sup>			100	20	100	6000	300	40	400	7400	300	3	10	270	300	6	50	240	6	160	1	Detected/Not Detected	
Sample Reference	Sample Depth	Sample Description																					
BH1	0.1-0.2	Fill: silty sandy gravel	11	LPQL	9	76	4	LPQL	3	1	0	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH1	1.5-1.95	Silty clay	4	LPQL	58	35	8	LPQL	34	51	0	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH2	0.1-0.2	Fill: sandy gravel	16	LPQL	5	48	3	LPQL	2	2	0	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH2	0.7-0.95	Gravelly clay	5	LPQL	94	20	18	LPQL	24	14	0	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH3	0.1-0.2	Fill: silty clay	29	LPQL	37	12	65	LPQL	9	40	1.8	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH3	0.5-0.95	Gravelly clay	7	LPQL	38	15	7	LPQL	12	12	0	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH4	0-0.2	Fill: silty sandy gravel	26	LPQL	39	56	54	0.2	15	120	0	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH4	0.5-0.95	Silty clay	4	LPQL	28	18	10	LPQL	9	18	0	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH5	0.2-0.4	Fill: sandy gravel	19	LPQL	7	89	3	LPQL	1	2	0	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH5	1.25-1.35	Silty clay	5	LPQL	56	32	10	LPQL	29	35	0	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH6	0-0.15	Fill: silty sand	34	LPQL	40	37	36	LPQL	21	74	0	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH6	0.5-0.75	Sandy silty clay	8	LPQL	28	18	13	LPQL	8	17	0	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH7	0-0.15	Fill: silty sand	5	LPQL	27	17	37	LPQL	9	93	3.4	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH7	0.5-0.65	Silty clay	LPQL	LPQL	68	12	21	LPQL	10	16	0.66	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH8	0-0.15	Fill: silty gravelly sand	13	LPQL	42	21	20	LPQL	8	13	1.8	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH8	2.0-2.2	Silty clay	LPQL	LPQL	55	20	9	LPQL	25	21	0	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH9	0-0.2	Fill: sandy silty clay	LPQL	LPQL	46	17	23	LPQL	16	18	4.5	0.5	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH9	0.5-0.7	Silty clay	LPQL	LPQL	58	26	10	LPQL	26	17	0	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Total Number of Samples</b>			18	18	18	18	18	18	18	18	18	18	9	9	9	9	9	9	9	9	9	9	9
<b>Maximum Value</b>			34	LPQL	94	89	65	0.2	34	120	4.5	0.5	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected

**Explanation:**

- 1 - Site Assessment Criteria (SAC): NEPM 2013, HIL-A: 'Residential with garden/accessible soils; children's day care centers; preschools; and primary schools'
- 2 - The results are for Total Chromium which includes Chromium III and VI. For initial screening purposes, we have assumed that the samples contain only Chromium VI unless demonstrated otherwise by additional analysis.
- 3 - B(a)P TEQ - Benzo(a)pyrene Toxicity Equivalence Quotient has been calculated based on 8 carcinogenic PAHs and their Toxic Equivalence Factors (TEFs) outlined in NEPM 2013

Concentration above the SAC VALUE

**Abbreviations:**

- PAHs: Polycyclic Aromatic Hydrocarbons
- B(a)P: Benzo(a)pyrene
- PQL: Practical Quantitation Limit
- LPQL: Less than PQL
- OPP: Organophosphorus Pesticides
- OCP: Organochlorine Pesticides
- PCBs: Polychlorinated Biphenyls
- UCL: Upper Level Confidence Limit on Mean Value
- HILs: Health Investigation Levels
- NA: Not Analysed
- NC: Not Calculated
- NSL: No Set Limit
- SAC: Site Assessment Criteria
- NEPM: National Environmental Protection Measure

**TABLE B**  
**SOIL LABORATORY RESULTS COMPARED TO HSLs**  
 All data in mg/kg unless stated otherwise

					C <sub>6</sub> -C <sub>10</sub> (F1)	>C <sub>10</sub> -C <sub>16</sub> (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	PID <sup>2</sup>
PQL - Envirolab Services					25	50	0.2	0.5	1	3	1	
HSL Land Use Category <sup>1</sup>					RESIDENTIAL WITH ACCESSIBLE SOIL							
Sample Reference	Sample Depth	Sample Description	Depth Category	Soil Category								
BH1	0.1-0.2	Fill: silty sandy gravel	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH1	1.5-1.95	Silty clay	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH2	0.1-0.2	Fill: sandy gravel	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH2	0.7-0.95	Gravelly clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH3	0.1-0.2	Fill: silty clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH3	0.5-0.95	Gravelly clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH4	0-0.2	Fill: silty sandy gravel	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH4	0.5-0.95	Silty clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH5	0.2-0.4	Fill: sandy gravel	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH5	1.25-1.35	Silty clay	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH6	0-0.15	Fill: silty sand	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.8
BH6	0.5-0.75	Sandy silty clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH7	0-0.15	Fill: silty sand	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	1.1
BH7	0.5-0.65	Silty clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH8	0-0.15	Fill: silty gravelly sand	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.5
BH8	2.0-2.2	Silty clay	2m to <4m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH9	0-0.2	Fill: sandy silty clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.6
BH9	0.5-0.7	Silty clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
<b>Total Number of Samples</b>					18	18	18	18	18	18	18	18
<b>Maximum Value</b>					LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	1.1

**Explanation:**

- 1 - Site Assessment Criteria (SAC): NEPM 2013
- 2 - Field PID values obtained during the investigation

Concentration above the SAC **VALUE**  
 The guideline corresponding to the elevated value is highlighted in grey in the Site Assessment Criteria Table below

**Abbreviations:**

- UCL: Upper Level Confidence Limit on Mean Value
- HSLs: Health Screening Levels
- NA: Not Analysed
- NC: Not Calculated
- NL: Not Limiting
- SAC: Site Assessment Criteria
- PQL: Practical Quantitation Limit
- LPQL: Less than PQL
- NEPM: National Environmental Protection Measure

SITE ASSESSMENT CRITERIA

					C <sub>6</sub> -C <sub>10</sub> (F1)	>C <sub>10</sub> -C <sub>16</sub> (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
PQL - Envirolab Services					25	50	0.2	0.5	1	3	1
HSL Land Use Category <sup>1</sup>					RESIDENTIAL WITH ACCESSIBLE SOIL						
Sample Reference	Sample Depth	Sample Description	Depth Category	Soil Category							
BH1	0.1-0.2	Fill: silty sandy gravel	0m to < 1m	Sand	45	110	0.5	160	55	40	3
BH1	1.5-1.95	Silty clay	1m to <2m	Clay	90	NL	1	NL	NL	310	NL
BH2	0.1-0.2	Fill: sandy gravel	0m to < 1m	Sand	45	110	0.5	160	55	40	3
BH2	0.7-0.95	Gravelly clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH3	0.1-0.2	Fill: silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH3	0.5-0.95	Gravelly clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH4	0-0.2	Fill: silty sandy gravel	0m to < 1m	Sand	45	110	0.5	160	55	40	3
BH4	0.5-0.95	Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH5	0.2-0.4	Fill: sandy gravel	0m to < 1m	Sand	45	110	0.5	160	55	40	3
BH5	1.25-1.35	Silty clay	1m to <2m	Clay	90	NL	1	NL	NL	310	NL
BH6	0-0.15	Fill: silty sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3
BH6	0.5-0.75	Sandy silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH7	0-0.15	Fill: silty sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3
BH7	0.5-0.65	Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH8	0-0.15	Fill: silty gravelly sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3
BH8	2.0-2.2	Silty clay	2m to <4m	Clay	150	NL	2	NL	NL	NL	NL
BH9	0-0.2	Fill: sandy silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH9	0.5-0.7	Silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5

**TABLE C**  
**SOIL LABORATORY RESULTS COMPARED TO EILs AND ESLs**  
 All data in mg/kg unless stated otherwise

Land Use Category <sup>1</sup>				URBAN RESIDENTIAL AND PUBLIC OPEN SPACE																				
Sample Reference	Sample Depth	Sample Description	Soil Texture	pH	CEC (cmol <sub>e</sub> /kg)	Clay Content (% clay)	AGED HEAVY METALS-EILs						EILs		ESLs									
							Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C <sub>6</sub> -C <sub>10</sub> (F1)	>C <sub>10</sub> -C <sub>16</sub> (F2)	>C <sub>16</sub> -C <sub>34</sub> (F3)	>C <sub>34</sub> -C <sub>40</sub> (F4)	Benzene	Toluene	Ethylbenzene	Total Xylenes	B(a)P	
PQL - Envirolab Services				-	1	-	4	1	1	1	1	1	0.1	0.1	25	50	100	100	0.2	0.5	1	3	0.05	
Ambient Background Concentration (ABC) <sup>2</sup>				-	-	-	NSL	8	18	104	5	77	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	
BH1	0.1-0.2	Fill: silty sandy gravel	Coarse	NA	NA	NA	11	9	76	4	3	1	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	
BH1	1.5-1.95	Silty clay	Fine	NA	NA	NA	4	58	35	8	34	51	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	
BH2	0.1-0.2	Fill: sandy gravel	Coarse	NA	NA	NA	16	5	48	3	2	2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	
BH2	0.7-0.95	Gravelly clay	Fine	NA	NA	NA	5	94	20	18	24	14	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	
BH3	0.1-0.2	Fill: silty clay	Fine	NA	NA	NA	29	37	12	65	9	40	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.2	
BH3	0.5-0.95	Gravelly clay	Fine	NA	NA	NA	7	38	15	7	12	12	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	
BH4	0-0.2	Fill: silty sandy gravel	Coarse	NA	NA	NA	26	39	56	54	15	120	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	
BH4	0.5-0.95	Silty clay	Fine	NA	NA	NA	4	28	18	10	9	18	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	
BH5	0.2-0.4	Fill: sandy gravel	Coarse	NA	NA	NA	19	7	89	3	1	2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	
BH5	1.25-1.35	Silty clay	Fine	NA	NA	NA	5	56	32	10	29	35	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	
BH6	0-0.15	Fill: silty sand	Coarse	NA	NA	NA	34	40	37	36	21	74	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	
BH6	0.5-0.75	Sandy silty clay	Fine	NA	NA	NA	8	28	18	13	8	17	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	
BH7	0-0.15	Fill: silty sand	Coarse	NA	NA	NA	5	27	17	37	9	93	LPQL	LPQL	LPQL	LPQL	110	LPQL	LPQL	LPQL	LPQL	LPQL	0.3	
BH7	0.5-0.65	Silty clay	Fine	NA	NA	NA	LPQL	68	12	21	10	16	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.06	
BH8	0-0.15	Fill: silty gravelly sand	Coarse	NA	NA	NA	13	42	21	20	8	13	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.1	
BH9	0-0.2	Fill: sandy silty clay	Fine	NA	NA	NA	LPQL	46	17	23	16	18	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.4	
BH9	0.5-0.7	Silty clay	Fine	NA	NA	NA	LPQL	58	26	10	26	17	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	
<b>Total Number of Samples</b>				0	0	0	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	
<b>Maximum Value</b>				LPQL	LPQL	LPQL	34	94	89	65	34	120	LPQL	LPQL	LPQL	LPQL	110	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.4

**Explanation:**

1 - Site Assessment Criteria (SAC): NEPM 2013

2 - ABC Values for selected metals has been adopted from the published background concentrations presented in Olszowy et. al., (1995), Trace Element Concentrations in Soils from Rural and Urban New South Wales (the 25th percentile values for old suburbs with low traffic have been quoted)

Concentration above the SAC

VALUE

The guideline corresponding to the elevated value is highlighted in grey in the EIL and ESL Assessment Criteria Table below

**Abbreviations:**

EILs: Ecological Investigation Levels

UCL: Upper Level Confidence Limit on Mean Value

LPQL: Less than PQL

NC: Not Calculated

B(a)P: Benzo(a)pyrene

ESLs: Ecological Screening Levels

SAC: Site Assessment Criteria

NSL: No Set Limit

PQL: Practical Quantitation Limit

NA: Not Analysed

NEPM: National Environmental Protection Measure

ABC: Ambient Background Concentration

EIL AND ESL ASSESSMENT CRITERIA

Land Use Category <sup>1</sup>				URBAN RESIDENTIAL AND PUBLIC OPEN SPACE																			
Sample Reference	Sample Depth	Sample Description	Soil Texture	pH	CEC (cmol <sub>e</sub> /kg)	Clay Content (% clay)	AGED HEAVY METALS-EILs						EILs		ESLs								
							Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C <sub>6</sub> -C <sub>10</sub> (F1)	>C <sub>10</sub> -C <sub>16</sub> (F2)	>C <sub>16</sub> -C <sub>34</sub> (F3)	>C <sub>34</sub> -C <sub>40</sub> (F4)	Benzene	Toluene	Ethylbenzene	Total Xylenes	B(a)P
PQL - Envirolab Services				-	1	-	4	1	1	1	1	1	0.1	0.1	25	50	100	100	0.2	0.5	1	3	0.05
Ambient Background Concentration (ABC) <sup>2</sup>				-	-	-	NSL	8	18	104	5	77	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
BH1	0.1-0.2	Fill: silty sandy gravel	Coarse	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	300	2800	50	85	70	105	0.7
BH1	1.5-1.95	Silty clay	Fine	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	1300	5600	60	105	125	45	0.7
BH2	0.1-0.2	Fill: sandy gravel	Coarse	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	300	2800	50	85	70	105	0.7
BH2	0.7-0.95	Gravelly clay	Fine	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	1300	5600	60	105	125	45	0.7
BH3	0.1-0.2	Fill: silty clay	Fine	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	1300	5600	60	105	125	45	0.7
BH3	0.5-0.95	Gravelly clay	Fine	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	1300	5600	60	105	125	45	0.7
BH4	0-0.2	Fill: silty sandy gravel	Coarse	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	300	2800	50	85	70	105	0.7
BH4	0.5-0.95	Silty clay	Fine	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	1300	5600	60	105	125	45	0.7
BH5	0.2-0.4	Fill: sandy gravel	Coarse	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	300	2800	50	85	70	105	0.7
BH5	1.25-1.35	Silty clay	Fine	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	1300	5600	60	105	125	45	0.7
BH6	0-0.15	Fill: silty sand	Coarse	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	300	2800	50	85	70	105	0.7
BH6	0.5-0.75	Sandy silty clay	Fine	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	1300	5600	60	105	125	45	0.7
BH7	0-0.15	Fill: silty sand	Coarse	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	300	2800	50	85	70	105	0.7
BH7	0.5-0.65	Silty clay	Fine	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	1300	5600	60	105	125	45	0.7
BH8	0-0.15	Fill: silty gravelly sand	Coarse	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	300	2800	50	85	70	105	0.7
BH8	2.0-2.2	Silty clay	Fine	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	1300	5600	60	105	125	45	0.7
BH9	0-0.2	Fill: sandy silty clay	Fine	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	1300	5600	60	105	125	45	0.7
BH9	0.5-0.7	Silty clay	Fine	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	1300	5600	60	105	125	45	0.7

**TABLE D**  
**SOIL LABORATORY RESULTS COMPARED TO WASTE CLASSIFICATION GUIDELINES**  
 All data in mg/kg unless stated otherwise

	HEAVY METALS									PAHs		OC/OP PESTICIDES				Total PCBs	TRH					BTEX COMPOUNDS				ASBESTOS FIBRES
	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P	Total Endosulfans	Chloropyrifos	Total Moderately Harmful <sup>2</sup>	Total Scheduled <sup>3</sup>	C <sub>6</sub> -C <sub>9</sub>		C <sub>10</sub> -C <sub>14</sub>	C <sub>15</sub> -C <sub>28</sub>	C <sub>29</sub> -C <sub>36</sub>	Total C <sub>10</sub> -C <sub>36</sub>	Benzene	Toluene	Ethyl benzene	Total Xylenes		
PQL - Envirolab Services	4	0.4	1	1	1	0.1	1	1	-	0.05	0.1	0.1	0.1	0.1	0.1	25	50	100	100	250	0.2	0.5	1	3	100	
General Solid Waste CT1 <sup>1</sup>	100	20	100	NSL	100	4	40	NSL	200	0.8	60	4	250	<50	<50	650		NSL	10,000	10	288	600	1,000	-		
General Solid Waste SCC1 <sup>1</sup>	500	100	1900	NSL	1500	50	1050	NSL	200	10	108	7.5	250	<50	<50	650		NSL	10,000	18	518	1,080	1,800	-		
Restricted Solid Waste CT2 <sup>1</sup>	400	80	400	NSL	400	16	160	NSL	800	3.2	240	16	1000	<50	<50	2600		NSL	40,000	40	1,152	2,400	4,000	-		
Restricted Solid Waste SCC2 <sup>1</sup>	2000	400	7600	NSL	6000	200	4200	NSL	800	23	432	30	1000	<50	<50	2600		NSL	40,000	72	2,073	4,320	7,200	-		
Sample Reference	Sample Depth	Sample Description																								
BH1	0.1-0.2		11	LPQL	9	76	4	LPQL	3	1	0	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected	
BH1	1.5-1.95		4	LPQL	58	35	8	LPQL	34	51	0	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA	
BH2	0.1-0.2		16	LPQL	5	48	3	LPQL	2	2	0	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected	
BH2	0.7-0.95		5	LPQL	94	20	18	LPQL	24	14	0	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA	
BH3	0.1-0.2		29	LPQL	37	12	65	LPQL	9	40	1.8	0.2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected	
BH3	0.5-0.95		7	LPQL	38	15	7	LPQL	12	12	0	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA	
BH4	0-0.2		26	LPQL	39	56	54	0.2	15	120	0	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected	
BH4	0.5-0.95		4	LPQL	28	18	10	LPQL	9	18	0	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA	
BH5	0.2-0.4		19	LPQL	7	89	3	LPQL	1	2	0	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected	
BH5	1.25-1.35		5	LPQL	56	32	10	LPQL	29	35	0	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA	
BH6	0-0.15		34	LPQL	40	37	36	LPQL	21	74	0	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected	
BH6	0.5-0.75		8	LPQL	28	18	13	LPQL	8	17	0	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA	
BH7	0-0.15		5	LPQL	27	17	37	LPQL	9	93	3.4	0.3	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	110	LPQL	LPQL	LPQL	LPQL	No asbestos detected	
BH7	0.5-0.65		LPQL	LPQL	68	12	21	LPQL	10	16	0.66	0.06	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA	
BH8	0-0.15		13	LPQL	42	21	20	LPQL	8	13	1.8	0.1	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected	
BH8	2.0-2.2		LPQL	LPQL	55	20	9	LPQL	25	21	0	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA	
BH9	0-0.2		LPQL	LPQL	46	17	23	LPQL	16	18	4.5	0.4	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected	
BH9	0.5-0.7		LPQL	LPQL	58	26	10	LPQL	26	17	0	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA	
<b>Total Number of samples</b>			18	18	18	18	18	18	18	18	18	18	9	9	9	9	9	18	18	18	18	18	18	18	9	
<b>Maximum Value</b>			34	LPQL	94	89	65	0.2	34	120	4.5	0.4	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	110	LPQL	LPQL	LPQL	LPQL	No asbestos detected	

**Explanation:**

<sup>1</sup> - NSW EPA Waste Classification Guidelines, Part 1: Classifying Waste (2014)

<sup>2</sup> - Assessment of Total Moderately Harmful pesticides includes: Dichlorovos, Dimethoate, Fenitrothion, Ethion, Malathion and Parathion

<sup>3</sup> - Assessment of Total Scheduled pesticides include: HBC, alpha-BHC, gamma-BHC, beta-BHC, Heptachlor, Aldrin, Heptachlor Epoxide, gamma-Chlordane, alpha-chlordane, pp-DDE, Dieldrin, Endrin, pp-DDD, pp-DDT, Endrin Aldehyde

Concentration above the CT1

VALUE

Concentration above SCC1

VALUE

Concentration above the SCC2

VALUE

**Abbreviations:**

PAHs: Polycyclic Aromatic Hydrocarbons

UCL: Upper Level Confidence Limit on Mean Value

CT: Contaminant Threshold

B(a)P: Benzo(a)pyrene

NA: Not Analysed

SCC: Specific Contaminant Concentration

PQL: Practical Quantitation Limit

NC: Not Calculated

HILs: Health Investigation Levels

LPQL: Less than PQL

NSL: No Set Limit

NEPM: National Environmental Protection Measure

PID: Photoionisation Detector

SAC: Site Assessment Criteria

BTEX: Monocyclic Aromatic Hydrocarbons

PCBs: Polychlorinated Biphenyls

TRH: Total Recoverable Hydrocarbons

**TABLE E**  
**SOIL LABORATORY RESULTS COMPARED TO DIRECT CONTACT CRITERIA**  
 All data in mg/kg unless stated otherwise

Analyte	C <sub>6</sub> -C <sub>10</sub>	>C <sub>10</sub> -C <sub>16</sub>	>C <sub>16</sub> -C <sub>34</sub>	>C <sub>34</sub> -C <sub>40</sub>	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	PID <sup>2</sup>	
PQL - Envirolab Services	25	50	100	100	0.2	0.5	1	3	1		
Direct contact Criteria <sup>1</sup>	82,000	62,000	85,000	120,000	1,100	120,000	85,000	130,000	29,000		
Site Use	<b>Intrusive Maintenance Worker - DIRECT SOIL CONTACT</b>										
Sample Reference	Sample Depth	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	
BH1	0.1-0.2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH1	1.5-1.95	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH2	0.1-0.2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH2	0.7-0.95	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH3	0.1-0.2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH3	0.5-0.95	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH4	0-0.2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH4	0.5-0.95	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH5	0.2-0.4	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH5	1.25-1.35	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH6	0-0.15	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.8
BH6	0.5-0.75	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH7	0-0.15	LPQL	LPQL	110	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	1.1
BH7	0.5-0.65	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH8	0-0.15	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.5
BH8	2.0-2.2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH9	0-0.2	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0.6
BH9	0.5-0.7	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0

**Explanation:**

<sup>1</sup> - Site Assessment Criteria (SAC):CRC for Contamination Assessment and Remediation of the Environment. Technical Report No 10. Health Screening levels for petroleum hydrocabons in soil and groundwater. Part1: Technical development document. September 2011

<sup>2</sup> - Field PID values obtained during the investigation

Concentration above the SAC

**VALUE**

**Abbreviations:**

CRC: Cooperative Research Centre  
 SAC: Site Assessment Criteria  
 NA: Not Analysed

PQL: Practical Quantitation Limit  
 LPQL: Less than PQL

**TABLE F**  
**SOIL INTRA-LABORATORY DUPLICATE RESULTS & RPD CALCULATIONS**  
 All results in mg/kg unless stated otherwise

SAMPLE	ANALYSIS	Envirolab PQL	INITIAL	REPEAT	MEAN	RPD %
Sample Ref = BH5 (0.2-0.4) Dup Ref = DUPKT1  Envirolab Report: 161238	Arsenic	4	19	15	17.0	24
	Cadmium	0.4	LPQL	LPQL	NC	NC
	Chromium	1	7	7	7.0	0
	Copper	1	89	40	64.5	76
	Lead	1	3	5	4.0	50
	Mercury	0.1	LPQL	LPQL	NC	NC
	Nickel	1	1	2	1.5	67
	Zinc	1	2	3	2.5	40
	Naphthalene	0.1	LPQL	LPQL	NC	NC
	Acenaphthylene	0.1	LPQL	LPQL	NC	NC
	Acenaphthene	0.1	LPQL	LPQL	NC	NC
	Fluorene	0.1	LPQL	LPQL	NC	NC
	Phenanthrene	0.1	LPQL	LPQL	NC	NC
	Anthracene	0.1	LPQL	LPQL	NC	NC
	Fluoranthene	0.1	LPQL	LPQL	NC	NC
	Pyrene	0.1	LPQL	LPQL	NC	NC
	Benzo(a)anthracene	0.1	LPQL	LPQL	NC	NC
	Chrysene	0.1	LPQL	LPQL	NC	NC
	Benzo(b,j+k)fluoranthene	0.2	LPQL	LPQL	NC	NC
	Benzo(a)pyrene	0.05	LPQL	LPQL	NC	NC
	Indeno(123-cd)pyrene	0.1	LPQL	LPQL	NC	NC
	Dibenzo(ah)anthracene	0.1	LPQL	LPQL	NC	NC
	Benzo(ghi)perylene	0.1	LPQL	LPQL	NC	NC
	TRH C <sub>6</sub> -C <sub>10</sub> (F1)	25	LPQL	LPQL	NC	NC
	TRH >C <sub>10</sub> -C <sub>16</sub> (F2)	50	LPQL	LPQL	NC	NC
	TRH >C <sub>16</sub> -C <sub>34</sub> (F3)	100	LPQL	LPQL	NC	NC
	TRH >C <sub>34</sub> -C <sub>40</sub> (F4)	100	LPQL	LPQL	NC	NC
	Benzene	0.5	LPQL	LPQL	NC	NC
	Toluene	0.5	LPQL	LPQL	NC	NC
	Ethylbenzene	1	LPQL	LPQL	NC	NC
	m+p-xylene	2	LPQL	LPQL	NC	NC
	o-xylene	1	LPQL	LPQL	NC	NC

**Explanation:**

The RPD value is calculated as the absolute value of the difference between the initial and repeat results divided by the average value expressed as a percentage. The following acceptance criteria will be used to assess the RPD results:

- Results > 10 times PQL = RPD value <= 50% are acceptable
- Results between 5 & 10 times PQL = RPD value <= 75% are acceptable
- Results < 5 times PQL = RPD value <= 100% are acceptable

If result is LPQL then 50% of the PQL is used for the calculation

RPD Results Above the Acceptance Criteria

VALUE

**Abbreviations:**

PQL: Practical Quantitation Limit

LPQL: Less than PQL

NA: Not Analysed

NC: Not Calculated

OCP: Organochlorine Pesticides

OPP: Organophosphorus Pesticides

PCBs: Polychlorinated Biphenyls

TRH: Total Recoverable Hydrocarbons

**TABLE G**  
**SUMMARY OF FIELD QA/QC RESULTS**

ANALYSIS	Envirolab PQL		TB1 <sup>s</sup>
	mg/kg	µg/L	31/01/2017
			mg/kg
Benzene	1	1	LPQL
Toluene	1	1	LPQL
Ethylbenzene	1	1	LPQL
m+p-xylene	2	2	LPQL
o-xylene	1	1	LPQL

**Explanation:**

<sup>w</sup> Sample type (water)

<sup>s</sup> Sample type (sand)

BTEX concentrations in trip spikes are presented as % recovery

Values above PQLs/Acceptance criteria

**VALUE**

**Abbreviations:**

PQL: Practical Quantitation Limit

LPQL: Less than PQL

NA: Not Analysed

NC: Not Calculated

TB: Trip Blank

TS: Trip Spike

RS: Rinsate Sample

TRH: Total Recoverable Hydrocarbons

## **REPORT APPENDICES**

## **Appendix A: Site Information including Site History**

## **Lotsearch Environmental Risk and Planning Report**