

8.2 Field Testing Results

Replicate soil samples collected in plastic bags were allowed to equilibrate under ambient temperatures before screening for Total Photoionisable Compounds (TOPIC) using a calibrated Photoionisation Detector (PID). Results of sample screening are presented in Table 5 and shown on Borehole Log Sheets in Appendix D. The PID readings were generally low with the exception of 110A/0.15 and 110A/0.5 which had PID's of 232 ppm and 214 ppm respectively. Bore 110A was located over a concrete lined sump pit situated within the former printing and the samples collected represent the contents of the pit, probably the by-products of the printing process.

Table 5 – TOPIC Results

Sample ID	TOPIC	Sample ID	TOPIC	Sample ID	TOPIC
101/0.3-0.5	2	105/1.3-1.5	1	110/0-0.1	30
101/1.3-1.5	1	106/0.3-0.5	2	110A/0.15	323
101/2.8-3	1	106/1.3-1.5	2	110A/0.5	214
102/0.3-0.5	2	106/2.8-3	0		
102/1.3-1.5	2	107/0.2-0.3	2		
103/0.3-0.5	1	107/0.4-0.5	1		
103/1.3-1.5	1	108/0.3-0.5	0		
103/2.8-3	2	108/1.3-1.5	1		
104/0.3-0.5	2	108/2.8-3	1		
104/1.3-1.5	0	109/0.3-0.5	3		
104/2.8-3	1	109/1.2-1.4	1		
105/0.3-0.5	0	109/2.8-3	1		

Shading indicates laboratory analysis conducted on sample

8.2.1 Groundwater Development Field Parameters

Field Parameters of the groundwater were measured in order to ensure that the groundwater bores were adequately developed and purged such that the samples were representative of the local groundwater conditions. Details of the groundwater field parameters are summarised in Table 6. Given that the field parameters measured achieved relative consistency, whereby they did not vary by more than 10%, it is considered that a representative sample of groundwater was collected from each of the bores.

Table 6 - Groundwater Field Parameters

Bore Number	Depth to Groundwater (m)	Groundwater level (R.L.)	Time	pH	Temperature (°C)	Dissolved Oxygen	Turbidity (NTU)
101	2.5	0.2	13:30	7.5	21	1.2	over
			13:40	7.4	21	0.35	over
			13:50	7.4	21	0.38	over
104	1.4	1.2	14:00	7.5	20.5	1.9	49.2
			14:10	7.6	20.5	0.8	over
			14:20	7.6	20.5	0.76	over
			14:30	7.6	20.5	0.37	over
			14:40	7.6	20.5	0.36	over
109	3.2	-1.0*	13:00	7.4	21	1.1	over
			13:10	7.4	21	0.4	over
			13:20	7.5	21	0.39	over

Notes: Over – above the practical limits of the turbidity meter. NB field parameters and samples taken on 30/5/05

* Drawdown may have occurred as a result of a nearby excavation for new sewage lines

8.3 Laboratory Results

The results of laboratory analysis for inorganic and organic contaminants (see Appendix C) in the soil samples are summarised in the Tables 7 and 8. Laboratory results for groundwater are summarised in Table 9 and the results of the acid sulphate soils analysis are summarised in Table 10.

Table 7 - Results of Heavy Metal Analysis Heavy Metals

Sample ID	Heavy Metals									
	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn		
101/0.3-0.5	17	<PQL	7.6	28	150	<PQL	13	66		
101/2.8-3.0	7.4	<PQL	11	15	140	<PQL	6.9	180		
102/0.3-0.5	2.9	<PQL	13	32	83	<PQL	10	68		
103/0.3-0.5	4.7	<PQL	10	33	130	<PQL	3.1	41		
104/0.3-0.5	3.3	<PQL	18	31	65	<PQL	9.8	53		
105/0.3-0.5	3.2	1.6	10	270	450	0.2	5.8	580		
106/0.3-0.5	4	11	20	20	41	<PQL	3.5	140		
107/0.2-0.3	7.1	2.1	16	760	180	<PQL	12	910		
108/0.3-0.5	2.5	<PQL	110	180	20	<PQL	280	420		
109/0.3-0.5	3.8	<PQL	41	9.3	14	<PQL	6.7	19		
109/1.2-1.4	3.9	<PQL	8.9	8.8	35	<PQL	2.6	270		
110/0-0.1	2.4	<PQL	2.7	4.1	1	<PQL	1.5	7.8		
110A/0.15	<PQL	<PQL	2	13	3	<PQL	1	24		
Z2	2.0	<PQL	13	27	20	<PQL	27	230		
Z3	<PQL	<PQL	4	56	10	<PQL	3	72		
PQL	1	1	1	1	1	0.1	1	1		
Guidelines ¹										
Residential (C2)	400	80	48%	4000	1200	60	2400	28000		

Notes:

- NSW EPA Contaminated Sites: Guidelines for the NSW Site Auditors Scheme, 1998. Health-based guidelines for Residential Sites with minimal access to soils (Column 2)
- ND Not defined
 PQL Practical Quantitation Limit
 Z2 Denotes field replicate of sample 108/0.3-0.5
 Z3 Denotes field replicate of sample 110/0.15

Table 8 - Results of Laboratory Analysis (mg/kg)

Sample ID	TRH		Benzene	Toluene	Ethyl-Benzene	Xylene	PAH		Total PCB	Total OPP	Total OCPs	Asbestos	VOCs	PHENOLS	PH	Cyanide	Sulphate	Chloride
	C6-C9	C10-C36					Total	B(a)P										
101/0.3-0.5	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.9	<PQL	<PQL	<PQL	<PQL	-	-	<PQL	-	-	-	-
101/1.3-1.5	-	-	-	-	-	-	-	-	-	-	-	ND	-	-	-	-	-	-
101/2.8-3.0	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.25	0.05	-	-	-	-	-	-	7.2	-	<PQL	520
102/0.3-0.5	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	16.4	1.6	<PQL	<PQL	<PQL	ND	-	<PQL	-	-	-	-
103/0.3-0.5	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	56	3.7	-	-	-	ND	-	-	7.8	-	<PQL	200
104/0.3-0.5	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	4.8	0.4	-	-	-	-	-	-	-	-	-	-
105/0.3-0.5	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	8.4	0.9	-	-	-	ND	-	-	-	-	-	-
106/0.3-0.5	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	11.9	1.4	-	-	-	-	-	-	-	-	-	-
107/0.2-0.3	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	12.5	1.2	-	-	-	-	-	-	-	-	-	-
108/0.3-0.5	-	-	-	-	-	-	1.45	0.05	<PQL	<PQL	<PQL	-	-	<PQL	7.5	-	<PQL	70
109/0.3-0.5	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.7	0.09	-	-	-	-	-	-	-	-	-	-
109/1.2-1.4	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.7	0.1	-	-	-	chrysot	-	-	-	-	-	-
110/0-0.1	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	-	<PQL	<PQL	-	-	-	-
110A/0.15	<PQL	969/0	-	-	-	-	<PQL	<PQL	-	-	-	-	<PQL	-	8.2	<PQL	-	-
Z3	<PQL	46500	<PQL	<PQL	<PQL	<PQL	-	-	-	-	-	-	-	-	-	-	-	-
Results Following Silica-Gel Cleanup																		
110A/0.15 _{rep}	-	101,400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Z3 _{rep}	-	45,300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PQL	25	300	0.5	0.5	0.5	1.5	-	0.1	0.9	0.1	0.1	-	1	0.5	-	0.5	5	5
Guidelines ¹																		
Residential (C2)	65 ²	1000 ²	1 ²	1.4 ²	3.1 ²	14 ²	80	4	34000	40	40/ 200/ 800/ 40	NIL*	-	34000	-	2000	-	-

Notes:

1. NSW EPA Contaminated Sites: *Guidelines for the NSW Site Auditors Scheme*, 1998. Health-based guidelines for Residential sites with minimal access to soils (Column 2)
2. NSW EPA Guidelines for Assessing Service Station Sites, 1994. Threshold concentrations for sensitive sites, (for TRH and BTEX, for all landuses).
3. given in order Aldrin+Dieldrin/Chlordane/ DDD+DDE+DDT/Heptachlor
- ND Not detected
- PQL Practical Quantitation Limit
- Z2 Denotes field replicate of sample 108/0.3-0.5
- Z3 Denotes field replicate of sample 110/0.15

Table 9 – Results of Laboratory Analysis for Groundwater (µg/L)

Sample ID	Hardness (mg/L)	Heavy Metals								TRH				Benzene	Toluene	Ethyl-Benzene	Xylene	pH	EC	Hardness
		As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	C6-C9	C10-C14	C15-C28	C29-C36							
101W	4000	<1	3.6	<5	<5	1.9	0.2	9	680	<10	<50	<100	<100	<1	<1	<1	<3	7.1	24000	4000
104W	330	-	-	-	-	-	-	-	-	<10	<50	<100	<100	<1	<1	<1	<3	7.2	960	330
109W	-	1	<1	2	1	<1	0.2	2	8	<10	<50	<100	<100	<1	<1	<1	<3	-	-	-
ZW	-	<1	<1	2	1	<1	0.2	4	10	-	-	-	-	-	-	-	-	-	-	-
Criteria ¹	-	-	5.5	27.4	1.3	4.4	0.4	70	15	-	-	600 ²	-	700	1000 ²	150 ²	-	-	-	-
Drinking Water ³	7	2	50	1000	10	1	20	3000	-	-	-	-	-	-	-	-	-	-	-	-

1. ANZECC Guidelines for the protection of aquatic ecosystems – Marine Waters (2000) – 95% Level of Protection (LOP). A 95% LOP has been adopted in view of the surrounding industrial and urban land-use (assumed to be a 'moderately disturbed ecosystem');
2. Dutch Water Quality Guidelines (1994) –intervention values [in absence of other guidelines];
3. ANZECC/NHMRC Australian Drinking Water Guidelines (1996) [for reference purposes only]
- PQL Practical Quantitation Limit
1. guideline adjusted for a hardness of 4000 mg/L
2. guideline adjusted for a hardness of 330 mg/L
- * Trigger value for 95% LOP for chromium III in marine water has been adopted, as there is insufficient data for the establishment of a corresponding trigger value for fresh water ecosystem
- ** o-xylene + p-xylene
- ZW Denotes a field replicate of 109W
- NA Not Available

Table 10 - Results of Acid Sulphate Soil Analysis

Sample ID	Sample Description ⁺	S-POCAS Results									
		pH [^]		Acid Trail (mol H ⁺ /tonne)				Sulphur Trail (%)			Retained Acidity (%)
		pH _f	pH _{fox}	Change	TAA	TPA	TSA	S _{KCL}	S _p	S _{POS}	
103/2.8	Sandy Clay – black sandy clay with organic matter	5.5	1.9	-3.6	10.2	1043	1032.7	0.062	1.75	1.7	-
104/2.8-3.0	Silty Clay – Dark grey silty Clay with organic matter and roots	8.6	3.3	-5.3	<10.2	110.43	110.43	0.022	0.48	0.48	-
106/1.3	Sandy Clay – yellow brown mottled grey sandy clay with organic matter	6.3	6.7	0.4							-
109/2.8	Sandy Clay – light grey sandy clay	6.0	2.5	-3.5	<10.2	<10.2	<10.2	<0.005	0.008	0.008	-
Guidelines	-	<4*	<3.5**	≤-1**	18# 36##	18# 36##	169.735	0.019	0.36	0.36	-

Notes:

TAA Total Actual Acidity
 TPA Total Potential Acidity
 TSA Total Sulphidic Acidity (TPA-TAA)
 S_{KCL} KCl extractable sulphur
 S_p peroxide oxidation sulphur
 S_{POS} Peroxide oxidisable sulphur
 S_{nas} Net acid soluble sulphur
 + provides brief description only, full material description given in Test Bore Reports, Appendix D
 * for Actual Acid Sulphate Soil
 ** Indicative value only, for Potential Acid Sulphate Soil
 # ASSMAC Action Criteria for disturbance of 1 – 1000 tonnes of coarse textured material ie sands to loamy sands
 ## ASSMAC Action Criteria for disturbance of 1 – 1000 tonnes of medium textured material ie sandy loams to light clay
 ^ pH_f non-oxidised pH
 pH_{fox} oxidised pH
 Change pH_{fox} – pH_f