Dubbo Regional Council Salinity Network site number (Figure 9)		DCC18	DCC19	DCC20	DCC42	DCC44	DCC45	DCC49	DCC53	DCC87	DCC111	DCC115	DCC116
Sampling date	Drilled depth (m)	15	3	15	2	6	9	15	9	6	6	9	3.5
Jul-07	EC(dS/m)	-	-	-	-	-	0.9	-	-	-	-	-	TSTB
	SWL (m)	DRY	DRY	DRY	DRY	DRY	7.62	DRY	DRY	DRY	DRY	DRY	3.25
Aug-07	EC(dS/m)	1.7	TSTB	1.00	-	-	0.9	-	-	-	1.00	-	-
	SWL (m)	4.52	2.69	14.36	DRY	DRY	7.31	DRY	DRY	DRY	7.53	DRY	DRY
Sep-07	EC(dS/m)	TSTB	TSTB	-	-	-	0.9	-	-	-	1.00	-	-
	SWL (m)	5.85	2.75	17.61	DRY	DRY	7.33	DRY	DRY	DRY	4.86	DRY	DRY
Oct-07	EC(dS/m)	-	-	-	-	-	TSTB	-	-	-	-	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	8.69	DRY	DRY	DRY	DRY	DRY	DRY
Nov-07	EC(dS/m)	-	-	-	-	-	TSTB	-	-	-	-	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	8.74	DRY	DRY	DRY	DRY	DRY	DRY
Dec-07	EC(dS/m)	-	-	-	-	-	TSTB	-	-	-	-	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	8.28	DRY	DRY	DRY	DRY	DRY	DRY
Jan-08	EC(dS/m)	-	-	-	-	-	TSTB	-	-	-	-	-	TSTB
	SWL (m)	DRY	DRY	DRY	DRY	DRY	7.79	DRY	DRY	DRY	DRY	DRY	3.29
Feb-08	EC(dS/m)	-	-	-	-	-	DRY	-	-	-	0.90	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	3.16	DRY	DRY
Mar-08	EC(dS/m)	-	-	-	-	-	0.5	-	-	-	0.90	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	7.3	-	DRY	DRY	3.3	DRY	DRY
Apr-08	EC(dS/m)	-	-	-	-	-	DRY	-	-	-	0.90	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	-	DRY	DRY	4.00	DRY	DRY
May-08	EC(dS/m)	-	-	-	-	-	DRY	-	-	-	0.90	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	-	DRY	DRY	4.70	DRY	DRY
Jun-08	EC(dS/m)	-	-	-	-	-	DRY	-	-	-	0.90	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	-	DRY	DRY	5.05	DRY	DRY
Jul-08	EC(dS/m)	-	-	-	-	-	-	-	-	-	1.10	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	-	DRY	DRY	5.00	DRY	DRY
Aug-08	EC(dS/m)	-	-	-	-	-	7.9	-	-	-	0.85	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	6.25	-	DRY	DRY	5.00	DRY	DRY

TSTB – Too shallow to bail

Dubbo Regional Council Salinity Network site number (Figure 9)		DCC18	DCC19	DCC20	DCC42	DCC44	DCC45	DCC49	DCC53	DCC87	DCC111	DCC115	DCC116
Sampling date	Drilled depth (m)	15	3	15	2	6	9	15	9	6	6	9	3.5
Sep-08	EC(dS/m)	-	-	-	-	-	0.9	-	-	-	-	0.2	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	6.56	-	DRY	DRY	DRY	6.2	DRY
Oct-08	EC(dS/m)	-	-	-	-	-	-	-	-	-	1.10	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	-	DRY	DRY	5.01	DRY	DRY
Nov-08	EC(dS/m)	-	-	-	-	-	0.7	-	-	-	-	0.2	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	7.4	-	DRY	DRY	DRY	6.08	DRY
Dec-08	EC(dS/m)	-	-	-	-	-	1.0	-	-	-	-	0.5	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	8.47	-	DRY	DRY	DRY	7.32	DRY
Jan-09	EC(dS/m)	-	-	-	-	-	-	New	-	-	-	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	bore	DRY	DRY	DRY	DRY	DRY
Feb-09	EC(dS/m)	-	-	-	-	-	-	-	-	-	-	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
Mar-09	EC(dS/m)	-	-	-	-	-	1.01	TSTB	-	-	1.16	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	6.6	11.38	DRY	DRY	4.15	DRY	DRY
Apr-09	EC(dS/m)	-	-	-	-	-	1.14	-	-	-	1.16	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	7.41	DRY	DRY	DRY	4.15	DRY	DRY
May-09	EC(dS/m)	-	-	TSTB	-	-	-	-	-	-	1.15	-	-
	SWL (m)	DRY	DRY	14.61	DRY	DRY	DRY	DRY	DRY	DRY	4.35	DRY	DRY
Jun-09	EC(dS/m)	-	-	-	-	-	-	-	-	-	-	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
Jul-09	EC(dS/m)	-	-	TSTB	-	-	0.96	-	-	1.99	1.02	-	-
	SWL (m)	DRY	DRY	14.70	DRY	DRY	7.35	DRY	DRY	4.88	4.56	DRY	DRY
Aug-09	EC(dS/m)	-	-	TSTB	-	-	1.08	-	-	2.47	1.19	-	-
	SWL (m)	DRY	DRY	14.78	DRY	DRY	7.96	DRY	DRY	5.13	4.70	DRY	DRY
Sep-09	EC(dS/m)	-	-	-	-	-	1.23	-	-	2.69	1.26	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	8.15	DRY	DRY	5.37	4.86	DRY	DRY
Oct-09	EC(dS/m)	-	-	TSTB	-	-	TSTB	-	-	2.41	1.11	0.52	-
	SWL (m)	DRY	DRY	14.77	DRY	DRY	8.79	DRY	DRY	4.64	4.81	7.38	DRY
Nov-09	EC(dS/m)	-	-	TSTB	-	-	1.5	-	-	-	1.53	-	-
	SWL (m)	DRY	DRY	14.78	DRY	DRY	8.52	DRY	DRY	DRY	5.01	DRY	DRY

TSTB – Too shallow to bail

Dubbo Regional Council Salinity Network site number (Figure 9)		DCC18	DCC19	DCC20	DCC42	DCC44	DCC45	DCC49	DCC53	DCC87	DCC111	DCC115	DCC116
Sampling date	Drilled depth (m)	15	3	15	2	6	9	15	9	6	6	9	3.5
Dec-09	EC(dS/m)	-	-	TSTB	-	-	1.33	-	-	2.09	1.40	-	-
	SWL (m)	DRY	DRY	14.68	DRY	DRY	7.83	DRY	DRY	4.53	4.69	DRY	DRY
Jan-10	EC(dS/m)	-	-	-	-	-	-	-	-	2.69	TSTB	-	TSTB
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	4.83	5.17	DRY	3.41
Feb-10	EC(dS/m)	-	-	-	-	-	TSTB	1.34	-	2.36	1.06	-	0.4
	SWL (m)	DRY	DRY	DRY	DRY	DRY	8.74	10.47	DRY	4.49	5.24	-	2.33
Mar-10	EC(dS/m)	-	-	-	-	-	-	1.68	-	2.58	TSTB	0.4	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	10.89	DRY	4.67	5.78	7.47	DRY
Apr-10	EC(dS/m)	-	TSTB	-	-	-	TSTB	-	-	3.07	TSTB	-	0.31
	SWL (m)	DRY	2.87	DRY	DRY	DRY	8.95	DRY	DRY	4.92	5.58	-	1.43
May-10	EC(dS/m)	-	-	-	-	-	-	-	-	3.19	-	DRY	0.51
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	4.86	DRY	DRY	1.57
Jun-10	EC(dS/m)	-	-	-	-	-	-	-	-	2.62	-	-	0.47
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	5.07	DRY	-	0.3
Jul-10	EC(dS/m)	-	-	-	-	-	-	-	-	2.49	TSTB	-	0.62
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	4.84	5.79	-	0.59
Aug-10	EC(dS/m)	-	-	-	-	-	0.87	-	-	1.79	TSTB	-	0.78
	SWL (m)	DRY	DRY	DRY	DRY	DRY	7.55	DRY	DRY	3.65	5.82	-	0.74
Sep-10	EC(dS/m)	-	-	-	-	-	0.75	-	-	1.70	-	-	0.67
	SWL (m)	DRY	DRY	DRY	DRY	DRY	7.36	DRY	DRY	3.60	DRY	-	1.03
Oct-10	EC(dS/m)	-	-	-	-	-	-	-	-	-	1.10	-	0.32
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	5.29	-	2.45
Nov-10	EC(dS/m)	-	-	-	-	-	0.38	-	-	0.85	0.55	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	3.68	DRY	DRY	1.80	2.65	-	-
Dec-10	EC(dS/m)	-	-	-	-	-	0.56	-	-	1.24	0.70	-	0.74
	SWL (m)	DRY	DRY	DRY	DRY	DRY	5.09	DRY	DRY	3.25	2.92	-	1.84
Jan-11	EC(dS/m)	-	-	-	-	-	0.75	-	-	1.63	0.85	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	6.5	DRY	DRY	4.70	3.20	-	DRY
Feb-11	EC(dS/m)	-	-	-	-	-	1.06	-	-	TSTB	0.69	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	8.21	DRY	DRY	5.48	3.90	DRY	DRY

TSTB – Too shallow to bail

Dubbo Regional Council Salinity Network site number (Figure 9)		DCC18	DCC19	DCC20	DCC42	DCC44	DCC45	DCC49	DCC53	DCC87	DCC111	DCC115	DCC116
Sampling date	Drilled depth (m)	15	3	15	2	6	9	15	9	6	6	9	3.5
Mar-11	EC(dS/m)	-	-	-	-	-	-	-	-	-	0.74	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	4.20	DRY	DRY
Apr-11	EC(dS/m)	-	-	-	-	-	-	-	-	-	1.08	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	5.59	DRY	DRY
May-11	EC(dS/m)	-	-	-	-	-	-	-	-	-	-	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
Jun-11	EC(dS/m)	-	-	-	-	-	-	-	-	-	TSTB	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	5.82	DRY	DRY
Jul-11	EC(dS/m)	-	-	-	-	-	-	-	-	-	-	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
Aug-11	EC(dS/m)	-	-	-	-	-	-	-	-	-	-	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
Sep-11	EC(dS/m)	-	-	-	-	-	-	-	-	-	TSTB	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	5.80	DRY	DRY
Oct-11	EC(dS/m)	-	-	-	-	-	-	-	-	-	-	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
Nov-11	EC(dS/m)	-	TSTB	-	-	-	-	-	-	0.72	-	-	2.47
	SWL (m)	DRY	2.93	DRY	DRY	DRY	DRY	DRY	DRY	4.60	DRY	DRY	1.23
Dec-11	EC(dS/m)	-	-	-	-	-	1.14	-	-	-	-	-	1.56
	SWL (m)	DRY	DRY	DRY	DRY	DRY	7.3	DRY	DRY	DRY	DRY	DRY	0.95
Jan-12	EC(dS/m)	-	-	-	-	-	1.22	-	-	-	-	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	7.48	DRY	DRY	DRY	DRY	DRY	DRY
Feb-12	EC(dS/m)	-	-	-	-	-	1.31	-	-	-	-	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	7.4	DRY	DRY	DRY	DRY	-	-
Mar-12	EC(dS/m)	1.43	TSTB	-	-	-	1.88	-	-	-	-	-	-
	SWL (m)	3.73	2.82	DRY	DRY	DRY	8.03	DRY	DRY	DRY	DRY	-	-
Apr-12	EC(dS/m)	2.01	-	-	-	-	2.14	-	-	-	-	-	-
	SWL (m)	4.25	DRY	DRY	DRY	DRY	8.62	DRY	DRY	DRY	DRY	-	-
May-12	EC(dS/m)	2.24	-	-	-	-	-	-	-	-	-	-	-
	SWL (m)	4.83	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	-

TSTB – Too shallow to bail

Dubbo Regional Council Salinity Network site number (Figure 9)		DCC18	DCC19	DCC20	DCC42	DCC44	DCC45	DCC49	DCC53	DCC87	DCC111	DCC115	DCC116
Sampling date	Drilled depth (m)	15	3	15	2	6	9	15	9	6	6	9	3.5
Jun-12	EC(dS/m)	-	-	-	-	-	-	-	-	-	-	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	-
Jul-12	EC(dS/m)	-	-	-	-	-	-	-	-	-	-	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	-
Aug-12	EC(dS/m)	-	-	-	-	-	-	-	-	-	-	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	-
Sep-12	EC(dS/m)	-	-	-	-	-	1.04	-	-	-	-	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	7.5	DRY	DRY	DRY	DRY	-	-
Oct-12	EC(dS/m)	-	-	-	-	-	-	-	-	-	-	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	-
Nov-12	EC(dS/m)	-	-	-	-	-	-	-	-	-	-	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	-
Dec-12	EC(dS/m)	-	-	-	-	-	-	-	-	-	-	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	-
Jan-13	EC(dS/m)	-	-	-	-	-	1.31	-	-	-	-	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	7.53	DRY	DRY	DRY	DRY	-	-
Feb-13	EC(dS/m)	-	-	-	-	-	-	-	-	-	-	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	DRY
Mar-13	EC(dS/m)	-	-	-	-	-	-	-	-	-	-	-	0.54
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	1.58
Apr-13	EC(dS/m)	-	-	-	-	-	-	-	-	-	-	-	0.3
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	1.63
May-13	EC(dS/m)	1.12	-	-	-	-	-	-	-	-	-	-	-
	SWL (m)	2.42	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	DRY
Jun-13	EC(dS/m)	-	-	-	-	-	-	-	-	-	-	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	DRY
Jul-13	EC(dS/m)	-	-	-	-	-	-	-	-	-	-	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	DRY
Aug-13	EC(dS/m)	-	-	-	-	-	-	-	-	-	-	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	-

TSTB – Too shallow to bail

Dubbo Regional Council Salinity Network site number (Figure 9)		DCC18	DCC19	DCC20	DCC42	DCC44	DCC45	DCC49	DCC53	DCC87	DCC111	DCC115	DCC116
Sampling date	Drilled depth (m)	15	3	15	2	6	9	15	9	6	6	9	3.5
Sep-13	EC(dS/m)	-	-	-	-	-	TSTB	-	-	-	-	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	8.68	DRY	DRY	DRY	DRY	-	-
Oct-13	EC(dS/m)	-	-	-	-	-	TSTB	-	-	-	-	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	8.68	DRY	DRY	DRY	DRY	-	-
Nov-13	EC(dS/m)	-	-	-	-	-	-	-	-	-	-	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	-
Dec-13	EC(dS/m)	-	-	-	-	-	1.05	-	-	-	-	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	7.98	DRY	DRY	DRY	DRY	-	-
Jan-14	EC(dS/m)	-	-	-	-	-	1.24	-	-	-	TSTB	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	5.60	DRY	DRY	DRY	5.30	-	-
Feb-14	EC(dS/m)	-	-	-	-	-	1.09	-	-	-	1.17	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	5.42	DRY	DRY	DRY	5.18	-	-
Mar-14	EC(dS/m)	-	-	-	-	-	1.25	-	-	-	1.22	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	6.08	DRY	DRY	DRY	5.00	-	-
Apr-14	EC(dS/m)	-	-	-	-	-	1.11	-	-	-	1.11	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	6.24	DRY	DRY	DRY	5.09	-	-
May-14	EC(dS/m)	1.02	-	-	-	-	0.94	-	-	-	-	-	-
	SWL (m)	2.59	DRY	DRY	DRY	DRY	5.98	DRY	DRY	DRY	DRY	-	-
Jun-14	EC(dS/m)	1.14	-	-	-	-	0.99	-	-	-	-	-	-
	SWL (m)	2.78	DRY	DRY	DRY	DRY	6.03	DRY	DRY	DRY	DRY	-	-
Jul-14	EC(dS/m)	1.25	-	-	-	-	1.03	-	-	-	-	-	-
	SWL (m)	2.91	DRY	DRY	DRY	DRY	6.20	DRY	DRY	DRY	DRY	-	-
Aug-14	EC(dS/m)	1.09	-	-	-	-	1.19	-	-	-	-	-	-
	SWL (m)	4.21	DRY	DRY	DRY	DRY	6.89	DRY	DRY	DRY	DRY	-	-
Sep-14	EC(dS/m)	-	-	-	-	-	-	-	-	-	-	-	-
	SWL (m)	-	-	-	-	-	-	-	-	-	-	-	-
Oct-14	EC(dS/m)	-	-	-	-	-	-	-	-	-	-	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	-	-
Nov-14	EC(dS/m)	1.57	TSTB	-	-	-	1.35	-	-	-	-	-	-
	SWL (m)	4.87	2.85	DRY	DRY	DRY	7.95	DRY	DRY	DRY	DRY	-	-

TSTB – Too shallow to bail

Dubbo Regional Council Salinity Network site number (Figure 9)		DCC18	DCC19	DCC20	DCC42	DCC44	DCC45	DCC49	DCC53	DCC87	DCC111	DCC115	DCC116
Sampling date	Drilled depth (m)	15	3	15	2	6	9	15	9	6	6	9	3.5
Dec-14	EC(dS/m)	1.70	TSTB	-	-	-	1.34	-	-	-	-	-	-
	SWL (m)	4.51	2.80	DRY	DRY	DRY	7.90	DRY	DRY	DRY	DRY	-	-
Jan-15	EC(dS/m)	1.42	-	-	-	-	1.25	-	-	-	-	-	-
	SWL (m)	4.69	DRY	DRY	DRY	DRY	6.61	DRY	-	-	DRY	-	-
Mar-15	EC(dS/m)	-	-	-	-	-	1.15	-	-	-	-	-	-
	SWL (m)	DRY	DRY	DRY	DRY	DRY	5.91	DRY	-	-	DRY	-	-
May-15	EC(dS/m)	1.49	-	-	-	-	1.19	-	-	-	-	-	-
	SWL (m)	3.31	DRY	DRY	DRY	DRY	7.02	DRY	-	-	DRY	-	-
Jul-15	EC(dS/m)	1.21	-	-	-	-	1.03	-	-	-	-	-	-
	SWL (m)	3.00	DRY	DRY	DRY	DRY	6.41	DRY	-	-	DRY	-	-
Sep-15	EC(dS/m)	0.98	-	-	-	-	1.09	-	-	-	-	-	-
	SWL (m)	4.87	DRY	DRY	DRY	DRY	7.85	DRY	-	-	DRY	-	-
Nov-15	EC(dS/m)	1.64	-	-	-	-	1.35	-	-	-	-	-	-
	SWL (m)	4.69	DRY	DRY	DRY	DRY	7.90	DRY	-	-	DRY	-	-
Jan-16	EC(dS/m)	-	-	-	-	0.65	2.13	-	-	-	-	-	0.15
	SWL (m)	DRY	DRY	DRY	DRY	1.29	7.50	DRY	-	-	DRY	-	2.14
Mar-16	EC(dS/m)	-	-	-	-	0.92	2.42	-	-	-	-	-	0.84
	SWL (m)	DRY	DRY	DRY	DRY	1.87	7.71	DRY	-	-	DRY	-	2.28
May-16	EC(dS/m)	-	-	-	-	1.69	1.69	-	-	-	-	-	0.94
	SWL (m)	DRY	DRY	DRY	DRY	7.31	7.31	DRY	-	-	DRY	-	2.49
Jul-16	EC(dS/m)	1.23	-	-	-	0.79	1.25	-	-	-	-	-	0.99
	SWL (m)	2.94	DRY	DRY	DRY	2.41	6.60	DRY	-	-	DRY	-	2.88
Sep-16	EC(dS/m)	1.11	-	-	-	0.58	1.17	-	-	-	-	-	0.84
	SWL (m)	2.71	DRY	DRY	DRY	2.15	6.31	DRY	-	-	DRY	-	2.69
Nov-16	EC(dS/m)	1.42	-	-	-	0.87	1.17	-	-	-	-	-	0.96
	SWL (m)	3.61	DRY	DRY	DRY	2.66	7.04	DRY	-	-	DRY	-	2.02

TSTB – Too shallow to bail

Appendix 5. Initial site investigation characteristics

Location (Figure 6)	Vegetation	Slope (%)	Bare areas	Indicators of salinity	Surface rocks	Trees (within 50m)
A1	Pasture grasses including lucerne, wild oats, rat's tail grass, hedge mustard	1% S	Nil	Nil	Nil	Nil
A2	Pasture grasses including lucerne, wild oats, rat's tail grass, hedge mustard	1% S	Nil	Nil	Nil	Nil
A3	Pasture grasses including lucerne, wild oats, rat's tail grass, hedge mustard	1% S	Nil	Nil	Nil	Nil
A4	Pasture grasses including lucerne, wild oats, rat's tail grass, hedge mustard	1% S	Nil	Nil	Nil	Nil
A5	Pasture grasses including wild oats, shepherd's purse	0-1% S	Nil	Nil	Nil	Nil
A6	Pasture grasses including wild oats, shepherd's purse	0-1% S	Nil	Nil	Nil	Nil
A7	Pasture grasses including wild oats, shepherd's purse	0-1% S	Nil	Nil	Nil	Nil
A8	Pasture grasses including wild oats, shepherd's purse	0-1% S	Nil	Nil	Nil	Nil
A9	Pasture grasses including wild oats, shepherd's purse	0-1% S	Nil	Nil	Nil	Nil
A10	Pasture grasses, hedge mustard, rat's tail grass, campulana	0-1% S	Nil	Nil	Nil	Nil
A11	Pasture grasses, hedge mustard, rat's tail grass, campulana	2% S	Nil	Nil	Nil	Nil
A12	Pasture grasses, hedge mustard, rat's tail grass, campulana, saffron thistle, yellow flowered pea	2% S	Nil	Nil	Nil	Nil
A13	Pasture grasses, hedge mustard, rat's tail grass, campulana	2% S	Nil	Nil	Nil	Nil
A14	Pasture grasses, Paterson's curse, wild oats and paper daisy	0-1% S	Nil	Nil	Nil	Nil
A15	Pasture grasses, Paterson's curse, wild oats, umbrella grass and paper daisy	2% S	Bare areas due to drainage areas into dam	Nil	Nil	Nil
A16	Spear grass, wild oats, wild lettuce, paspalum	5% E towards drainage line	Nil	Nil	Nil	Nil
A17	Wild oats, skeleton weeds, wild lettuce, foxtail	0-1% S	Nil	Nil	Nil	Cyprus pines, eucalypt
A18	Cathead, wild oats, wild lettuce, hedge mustard	0-1% N	Nil	Nil	Nil	Cyprus pines
B1	Pasture grasses including lucerne, wild oats, rat's tail grass, hedge mustard	1% S	Nil	Nil	Nil	Nil
B2	Pasture grasses including lucerne, wild oats, rat's tail grass, hedge mustard	1% S	Nil	Nil	Nil	Nil
B3	Pasture grasses including lucerne, wild oats, rat's tail grass, hedge mustard	1% S	Nil	Nil	Nil	Nil
B4	Pasture grasses including lucerne, wild oats, rat's tail grass, hedge mustard	1% S	Nil	Nil	Nil	Nil
B5	Pasture grasses including wild oats, shepherd's purse	0-1% S	Nil	Nil	Nil	Nil
B6	Pasture grasses including wild oats and shepherd's purse	0-1% S	Nil	Nil	Nil	Nil
B7	Pasture grasses including wild oats and shepherd's purse	0-1% S	Nil	Nil	Nil	Nil
B8	Pasture grasses including wild oats and shepherd's purse	0-1% S	Nil	Nil	Nil	Nil
B9	Pasture grasses including wild oats and shepherd's purse	0-1% S	Nil	Nil	Nil	Nil

B10	Pasture grasses, hedge mustard, rat's tail grass, campulana	0-1% S	Nil	Nil	Nil	Nil
B11	Pasture grasses, hedge mustard, rat's tail grass, campulana	0-1% S	Nil	Nil	Nil	Nil
B12	Pasture grasses, hedge mustard, rat's tail grass, campulana, saffron thistle, yellow flowered pea	2% S	Nil	Nil	Nil	Nil
B13	Pasture grasses, hedge mustard, rat's tail grass, campulana, saffron thistle, yellow flowered pea	2% S	Nil	Nil	Nil	Nil
B14	Pasture grasses, Paterson's curse, wild oats and paper daisy	0-1% S	Nil	Nil	Nil	Nil
B15	Pasture grasses, Paterson's curse, wild oats, umbrella grass and paper daisy	2% S	Bare areas due to drainage areas into dam	Nil	Nil	Nil
B16	Spear grass, wild oats, wild lettuce, paspalum	1% W	Nil	Nil	Nil	Nil
B17	Hedge mustard, amaranth, saffron thistle, skeleton weed, wild sage, wild oats, plantain, foxtail	0-% N	Scattered	Nil	Nil	Eucalypt
B18	Cathead, wild oats, wild lettuce, hedge mustard	0-1% N	Nil	Nil	Nil	Cyprus pines
C1	Pasture grasses including lucerne, wild oats, rat's tail grass, hedge mustard	1% S	Nil	Nil	Nil	Nil
C2	Pasture grasses including lucerne, wild oats, rat's tail grass, hedge mustard	1% S	Nil	Nil	Nil	Nil
C3	Pasture grasses including lucerne, wild oats, rat's tail grass, hedge mustard	1% S	Nil	Nil	Nil	Nil
C4	Pasture grasses including lucerne, wild oats, rat's tail grass, hedge mustard	1% S	Nil	Nil	Nil	Nil
C5	Pasture grasses including wild oats, shepherd's purse	0-1% S	Nil	Nil	Nil	Nil
C6	Pasture grasses including wild oats, shepherd's purse	0-1% S	Nil	Nil	Nil	Nil
C7	Pasture grasses including wild oats, shepherd's purse	0-1% S	Nil	Nil	Nil	Nil
C8	Pasture grasses including wild oats, shepherd's purse	0-1% S	Nil	Nil	Nil	Nil
C10	Pasture grasses, hedge mustard, rat's tail grass, campulana	2% S	Nil	Nil	Nil	Nil
C11	Pasture grasses, hedge mustard, rat's tail grass	2% S	Nil	Nil	Nil	Nil
C12	Pasture grasses, hedge mustard, rat's tail grass	2% S	Nil	Nil	Nil	Nil
C13	Pasture grasses, hedge mustard, rat's tail grass, campulana	2% S	Nil	Nil	Nil	Nil
C14	Pasture grasses, Paterson's curse, wild oats, paper daisy	2% S	Nil	Nil	Nil	Nil
C15	Nightshade, wild oats, pasture grasses, paper daisy	0-1% N	Nil	Nil	Nil	Nil
C16	Spear grass, wild oats, wild lettuce, paspalum	0-1% S	Nil	Nil	Nil	Nil
C17	Paspalum, red grass, shepherds purse	0-1% S	Nil	Nil	Nil	Nil
C18	Wild lettuce, thistle, wild oats, hedge mustard	0-1% N	Nil	Nil	Nil	Cyprus pine, eucalypt
D1	Pasture grass, rat's tail grass, hedge mustard	1% S	Nil	Nil	Nil	Nil
D2	Pasture grass, rat's tail grass, hedge mustard	1% S	Nil	Nil	Nil	Nil
D3	Pasture grass, rat's tail grass, hedge mustard, Paterson's curse, campulana	1% N	Nil	Nil	Nil	Nil
D4	Pasture grass, rat's tail grass, hedge mustard, Paterson's curse, campulana	1% N	Nil	Nil	Nil	Nil

D5	Pasture grasses including wild oats, shepherd's purse	0-1% S	Nil	Nil	Nil	Nil
D6	Pasture grasses including wild oats, shepherd's purse	0-1% S	Nil	Nil	Nil	Nil
D7	Pasture grasses including wild oats, shepherd's purse	0-1% S	Nil	Nil	Nil	Nil
D8	Pasture grasses including wild oats, shepherd's purse	0-1% S	Nil	Nil	Nil	Nil
D10	Pasture grasses, hedge mustard, rat's tail grass, campulana	2% S	Nil	Nil	Nil	Nil
D11	Pasture grasses, hedge mustard, rat's tail grass, campulana	2% S	Nil	Nil	Nil	Nil
D12	Pasture grasses, hedge mustard, rat's tail grass, campulana	2% S	Nil	Nil	Nil	Nil
D13	Pasture grasses, hedge mustard, rat's tail grass, campulana	2% S	Nil	Nil	Nil	Nil
D14	Wild oats, umbrella grass, Paterson's curse, yellow flowered legume	0-1% SE	Nil	Nil	Nil	Ni
D15	Wild oats, umbrella grass, Paterson's curse, yellow flowered legume	0-1% SE	Nil	Nil	Nil	Ni
D16	Wild oats, umbrella grass, Paterson's curse, yellow flowered legume	0-1% SE	Nil	Nil	Nil	Cyprus pine
D17	Pasture grass, wild oats, umbrella grass, Lucerne, Paterson's curse	0-1% S	Nil	Nil	Nil	Eucalypt
D18	Wild oats, saffron thistle, spear grass, Paterson's curse	3% S	Nil	Nil	Nil	Eucalypt
E1	Pasture grass, rat's tail grass, hedge mustard	1% S	Nil	Nil	Nil	Nil
E2	Pasture grass, rat's tail grass, hedge mustard	1% S	Nil	Nil	Nil	Nil
E3	Pasture grass, rat's tail grass, hedge mustard, saffron thistle	3% N	Nil	Nil	Nil	Nil
E4	Pasture grass, rat's tail grass, hedge mustard, saffron thistle	3% N	Nil	Nil	Nil	Nil
E5	Lucerne, cathead, hedge mustard	2% E	Nil	Nil	Scattered rocks	Nil
E6	Lucerne, cathead, hedge mustard	2% E	Nil	Nil	Scattered rocks	Nil
E7	Lucerne, cathead, hedge mustard	2% SE	Nil	Nil	Nil	Nil
E8	Lucerne, cathead, hedge mustard	2% SE	Nil	Nil	Nil	Nil
E10	Pasture grasses, hedge mustard, rat's tail grass	2% S	Nil	Nil	Scattered rocks	Nil
E11	Pasture grasses, hedge mustard, rat's tail grass,	2% S	Nil	Nil	Scattered rocks	Nil
E12	Pasture grasses, hedge mustard, rat's tail grass	2% S	Nil	Nil	Scattered rocks	Nil
E13	Pasture grasses, hedge mustard, rat's tail grass	2% S	Nil	Nil	Scattered rocks	Nil
E14	Wild oats, prairie grass, Paterson's curse, hedge mustard, saffron thistle	2% SW	Nil	Nil	Nil	Nil
E15	Saffron thistle, spear grass, wild oats, wild lettuce, paspalum, saffron thistle	3% W	Nil	Nil	Nil	Nil
E16	Saffron thistle, spear grass, wild oats, wild lettuce, paspalum, saffron thistle	3% W	Nil	Nil	Nil	Nil
E17	Wild oats, Lucerne, foxtail	3% SW	Nil	Nil	Nil	Eucalypt
E18	Pasture grasses, saffron thistle, wild oats, wild sagehedge mustard	0-1% S	Nil	Nil	Nil	Eucalypt
F1	Pasture grasses, hedge mustard, rat's tail grass	1-2% N	Nil	Nil	Nil	Nil
F2	Pasture grasses, hedge mustard, rat's tail grass	1-2% N	Nil	Nil	Nil	Nil
F3	Pasture grasses, hedge mustard, rat's tail grass	1-2% N	Nil	Nil	Nil	Nil

F4	Pasture grasses, hedge mustard, rat's tail grass, lucerne	4 % N	Nil	Nil	Scattered rocks	Nil
F5	Lucerne, cathead, hedge mustard	2% E	Nil	Nil	Scattered rocks	Nil
F6	Lucerne, cathead, hedge mustard	2% S	Nil	Nil	Scattered rocks	Nil
F7	Lucerne, cathead, hedge mustard	2% S	Nil	Nil	Nil	Nil
F8	Lucerne, cathead, hedge mustard	2% S	Nil	Nil	Nil	Nil
F9	Lucerne, cathead, hedge mustard	2% S	Nil	Nil	Nil	Nil
F10	Pasture grasses, hedge mustard, rat's tail grass	2% S	Nil	Nil	Scattered rocks	Nil
F11	Pasture grasses, hedge mustard, rat's tail grass	2% S	Nil	Nil	Scattered rocks	Nil
F12	Pasture grasses, hedge mustard, rat's tail grass	2% S	Nil	Nil	Scattered rocks	Nil
F13	Pasture grasses, hedge mustard, rat's tail grass, campulana	2% S	Nil	Nil	Scattered rocks	Nil
F14	Pasture grass, hedge mustard, lucerne	2% S	Nil	Nil	Nil	Nil
F15	Wild oats, Lucerne, Paterson's curse, clover, saffron thistle	1% NW	Nil	Nil	Nil	Nil
F16	Wild oats, Lucerne, Paterson's curse, clover, saffron thistle	1% NW	Nil	Nil	Nil	Nil
F17	Wild oats, hedge mustard, Lucerne, pasture grass, saffron thistle	0-1% SW	Nil	Nil	Nil	Eucalypt
F18	Wild oats, hedge mustard, Lucerne, pasture grass, saffron thistle	0-1% SW	Nil	Nil	Nil	Eucalypt

Appendix 5. Field and laboratory sheets

Salinity assessment

Client: Maas Group Properties Pty Ltd			Job no: 7891	Date:	10/01/2017
Address:	Lot 2 DP880413 Sheraton Road, Dubbo				
Borehole:	1	GPS:	55H 655142mE 6428025mN		

Surface description

Slope:	0-1%	Aspect:	South west
Morphological type:	Mid-slope		
Land-use:	Grazing		
Disturbance:	High		
Erosion:	Nil		
Coarse fragments:	Nil on surface		
Surface cover:	Lucerne, wild oats		
% surface cover	100%		
Salinity:	Nil		

Sub-surface description

Sample method: EVH		Logged by: LD					
Depth (mm)	Soil description (texture, colour, coarse fragments, mottles, roots, structure)	Sample	M/D	pH (1:5 water)	EC (dS/m)	ECe	Emerson aggregate test
0 to 200	Strong brown sandy clay	X	M	6.7	0.12	0.90	5
		X		7.1	0.12	0.90	5
200 to 1800	Reddish brown sandy clay with fine	X	M	7.3	0.11	0.83	5
	gravel and sand	X		7.3	0.11	0.83	5
		X		7.3	0.12	0.90	5
		X		7.4	0.17	1.28	6
1800 to 2200	Dark yellowish brown light clay	X	M	7.5	0.20	1.50	6
2200 to 3200	Dark yellowish brown medium clay	X	M	7.6	0.21	1.22	6
		X		7.6	0.17	0.99	6
3200 to 4900	Dark yellowish brown sandy clay with	X	M	7.7	0.15	1.23	6
	fine gravel	X	M	8.1	0.16	1.20	5
		X		7.2	0.18	1.35	5
4900 to 9000	Dark yellowish brown fine sandy clay	X	M	8.4	0.15	1.43	5
	loam with white mottles and	X		8.2	0.13	1.24	5
	weathered ironstone from 5600mm	X		8.3	0.13	1.24	5
		X		8.3	0.12	1.14	5
		X		8.4	0.10	0.95	5
		X		7.9	0.08	0.60	3
		X		8.5	0.07	0.53	3
		X		8.2	0.09	0.68	3
		X		8.2	0.08	0.60	3
9000	End of hole, refusal on basalt cobbles						
Notes: Nil							

Salinity assessment

Client: Maas Group Properties Pty Ltd		Job no: 7891	Date: 10/01/2017
Address:	Lot 2 DP880413 Sheraton Road, Dubbo		
Borehole: 2		GPS: 55H 655003mE 6428055mN	

Surface description

Slope:	0%	Aspect:	South west
Morphological type:	Mid-slope		
Land-use:	Grazing		
Disturbance:	High		
Erosion:	Nil		
Coarse fragments:	Nil on surface		
Surface cover:	Lucerne, wild oats, hedge mustard and foxtail		
% surface cover	100%		
Salinity:	Nil		

Sub-surface description

Sample method: EVH		Logged by: LD					
Depth (mm)	Soil description (texture, colour, coarse fragments, mottles, roots, structure)	Sample	M/D	pH (1:5 water)	EC (dS/m)	ECe	Emerson aggregate test
0 to 400	Red sandy loam		M				
400 to 2000	Red sandy clay with weathered ironstone		M				
2000	End of hole						
Notes: Nil							

Salinity assessment

Client: Maas Group Properties Pty Ltd		Job no: 7891	Date: 10/01/2017
Address:	Lot 2 DP880413 Sheraton Road, Dubbo		
Borehole: 3		GPS: 55H 654866mE 6428071mN	

Surface description

Slope:	1%	Aspect:	West
Morphological type:	Mid-slope		
Land-use:	Grazing		
Disturbance:	High		
Erosion:	Nil		
Coarse fragments:	Nil on surface		
Surface cover:	Lucerne, wild oats, hedge mustard, foxtail, saffron thistle, wild sage		
% surface cover	100%		
Salinity:	Nil		

Sub-surface description

Sample method: EVH		Logged by: LD					
Depth (mm)	Soil description (texture, colour, coarse fragments, mottles, roots, structure)	Sample	M/D	pH (1:5 water)	EC (dS/m)	ECe	Emerson aggregate test
0 to 100	Reddish brown sandy clay loam	X	M	5.8	0.03	0.29	3
100 to 400	Reddish brown fine sandy clay	X	M	6.3	0.02	0.15	3
		X		6.7	0.01	0.08	3
400 to 1400	Dark red light clay	X	M	6.6	0.01	0.08	5
		X		6.9	0.02	0.15	5
1400 to 1800	Dark red medium clay	X	M	6.8	0.01	0.06	5
		X		7.1	0.01	0.06	3
1800	End of hole, refusal on rock						
Notes: Hit rock at 1,200mm 20m west							

Salinity assessment

Client: Maas Group Properties Pty Ltd		Job no: 7891	Date: 10/01/2017
Address:	Lot 2 DP880413 Sheraton Road, Dubbo		
Borehole: 4		GPS: 55H 654832mE 6427974mN	

Surface description

Slope:	0-1%	Aspect:	North west
Morphological type:	Mid-slope		
Land-use:	Grazing		
Disturbance:	High		
Erosion:	Nil		
Coarse fragments:	Nil on surface		
Surface cover:	Wild oats, Lucerne, umbrella grass		
% surface cover	100%		
Salinity:	Nil		

Sub-surface description

Sample method: EVH		Logged by: LD					
Depth (mm)	Soil description (texture, colour, coarse fragments, mottles, roots, structure)	Sample	M/D	pH (1:5 water)	EC (dS/m)	ECe	Emerson aggregate test
0 to 100	Reddish brown sandy loam	X	M	5.8	0.04	0.56	3
100 to 300	Dark red silty clay with gravel	X	M	5.6	0.02	0.17	2
		X	D	6.1	0.02	0.17	3
300 to 1400	Basalt rock						
1400	End of hole, refusal on basalt cobbles						
Notes:							

Salinity assessment

Client: Maas Group Properties Pty Ltd		Job no: 7891	Date: 10/01/2017
Address:	Lot 2 DP880413 Sheraton Road, Dubbo		
Borehole: 5		GPS: 55H 654991mE 6427929mN	

Surface description

Slope:	0-1%	Aspect:	West
Morphological type:	Mid-slope		
Land-use:	Grazing		
Disturbance:	High		
Erosion:	Nil		
Coarse fragments:	Nil		
Surface cover:	Wild oats, Lucerne, hedge mustard, nightshade, foxtail		
% surface cover	98% due to vegetation shading		
Salinity:	Nil		

Sub-surface description

Sample method: EVH		Logged by: LD					
Depth (mm)	Soil description (texture, colour, coarse fragments, mottles, roots, structure)	Sample	M/D	pH (1:5 water)	EC (dS/m)	ECe	Emerson aggregate test
0 to 400	Red sandy loam		M				
400 to 800	Red sandy clay		M				
800 to 1700	Red light clay		M				
1700 to 2200	Dark red light clay		M				
2200 to 3000	Brown light clay		M				
3000	End of hole						
Notes:							

Salinity assessment

Client: Maas Group Properties Pty Ltd		Job no: 7891	Date: 10/01/2017
Address:	Lot 2 DP880413 Sheraton Road, Dubbo		
Borehole: 6		GPS: 55H 655102mE 6427929mN	

Surface description

Slope:	1%	Aspect:	West
Morphological type:	Mid-slope		
Land-use:	Grazing		
Disturbance:	High		
Erosion:	Nil		
Coarse fragments:	Nil		
Surface cover:	Wild oats, Lucerne, red flowered mallow, nightshade		
% surface cover	100%		
Salinity:	Nil		

Sub-surface description

Sample method: EVH		Logged by: LD					
Depth (mm)	Soil description (texture, colour, coarse fragments, mottles, roots, structure)	Sample	M/D	pH (1:5 water)	EC (dS/m)	ECe	Emerson aggregate test
0 to 200	Brown sandy loam		M				
200 to 2200	Brown sandy clay		M				
2200 to 3000	Dark red clay		M				
3000	End of hole						
Notes:							

Salinity assessment

Client: Maas Group Properties Pty Ltd		Job no: 7891	Date: 10/01/2017
Address:	Lot 2 DP880413 Sheraton Road, Dubbo		
Borehole: 7		GPS: 55H 655061mE 6427789mN	

Surface description

Slope:	0-1%	Aspect:	East
Morphological type:	Mid-slope		
Land-use:	Grazing		
Disturbance:	High		
Erosion:	Nil		
Coarse fragments:	Nil		
Surface cover:	Wild oats, hedge mustard, khaki weed		
% surface cover	100%		
Salinity:	Nil		

Sub-surface description

Sample method: EVH		Logged by: LD					
Depth (mm)	Soil description (texture, colour, coarse fragments, mottles, roots, structure)	Sample	M/D	pH (1:5 water)	EC (dS/m)	ECe	Emerson aggregate test
0 to 300	Brown sandy loam		M				
300 to 1700	Red sandy clay		M				
1700 to 2000	Brown light clay		M				
2000	End of hole						
Notes:							

Salinity assessment

Client: Maas Group Properties Pty Ltd		Job no: 7891	Date: 10/01/2017
Address:	Lot 2 DP880413 Sheraton Road, Dubbo		
Borehole: 8		GPS: 55H 654962mE 6427810mN	

Surface description

Slope:	0-1%	Aspect:	South east
Morphological type:	Mid-slope		
Land-use:	Grazing		
Disturbance:	High		
Erosion:	Nil		
Coarse fragments:	Nil		
Surface cover:	Lucerne, wild oats, hedge mustard		
% surface cover	100%		
Salinity:	Nil		

Sub-surface description

Sample method: EVH		Logged by: LD					
Depth (mm)	Soil description (texture, colour, coarse fragments, mottles, roots, structure)	Sample	M/D	pH (1:5 water)	EC (dS/m)	ECe	Emerson aggregate test
0 to 300	Brown sandy loam		M				
300 to 1300	Brownish red sandy clay		M				
1300 to 2000	Brown sandy loam		M				
2000	End of hole, refusal on rock						
Notes:							

Salinity assessment

Client: Maas Group Properties Pty Ltd		Job no: 7891	Date: 10/01/2017
Address:	Lot 2 DP880413 Sheraton Road, Dubbo		
Borehole: 9		GPS: 55H 654798mE 6427829mN	

Surface description

Slope:	0-1%	Aspect:	East
Morphological type:	Mid-slope		
Land-use:	Grazing		
Disturbance:	High		
Erosion:	Nil		
Coarse fragments:	Nil		
Surface cover:	Saffron thistle, wild oats, fat hen		
% surface cover	100%		
Salinity:	Nil		

Sub-surface description

Sample method: EVH		Logged by: DL					
Depth (mm)	Soil description (texture, colour, coarse fragments, mottles, roots, structure)	Sample	M/D	pH (1:5 water)	EC (dS/m)	ECe	Emerson aggregate test
0 to 1500	Dark red clayey gravel with basalt cobbles		M				
1500	End of hole, refusal on rock						
Notes:							

Salinity assessment

Client: Maas Group Properties Pty Ltd		Job no: 7891	Date: 10/01/2017
Address:	Lot 2 DP880413 Sheraton Road, Dubbo		
Borehole: 10		GPS: 55H 654753mE 6427691mN	

Surface description

Slope:	0-1%	Aspect:	East
Morphological type:	Mid-slope		
Land-use:	Grazing		
Disturbance:	High		
Erosion:	Nil		
Coarse fragments:	Nil		
Surface cover:	Lucerne, fat hen, Paterson's curse		
% surface cover	100%		
Salinity:	Nil		

Sub-surface description

Sample method: EVH		Logged by: DL					
Depth (mm)	Soil description (texture, colour, coarse fragments, mottles, roots, structure)	Sample	M/D	pH (1:5 water)	EC (dS/m)	ECe	Emerson aggregate test
0 to 400	Dark reddish brown silty clay		M				
400 to 800	Dark red sandy clay		M				
800 to 1400	Dark brownish red gravelly clay (weathered basalt)		D				
1400 to 2400	Light brown sandy clay with increasing gravel		D				
2400	End of hole, refusal on rock						
Notes:							

Salinity assessment

Client: Maas Group Properties Pty Ltd		Job no: 7891	Date: 10/01/2017
Address:	Lot 2 DP880413 Sheraton Road, Dubbo		
Borehole: 11	GPS: 55H 654932mE 6427677mN		

Surface description

Slope:	0-1%	Aspect:	East
Morphological type:	Mid-slope		
Land-use:	Grazing		
Disturbance:	High		
Erosion:	Nil		
Coarse fragments:	Surface float		
Surface cover:	Wild oats, Lucerne, hedge mustard		
% surface cover	100%		
Salinity:	Nil		

Sub-surface description

Sample method: EVH		Logged by: LD					
Depth (mm)	Soil description (texture, colour, coarse fragments, mottles, roots, structure)	Sample	M/D	pH (1:5 water)	EC (dS/m)	ECe	Emerson aggregate test
0 to 100	Red sandy loam		D				
100 to 200	Dark red sandy loam		D				
200 to 1600	Dark red sandy clay with gravel from 800mm		D				
1600 to 1700	Reddish brown gravelly clay		D				
1700 to 2800	Brown sandy clay		D				
2800 to 3000	Yellowish brown sandy clay with calcite nodules		D				
3000 to 4100	Brownish yellow sandy clay		D				
4100 to 4200	Strong brown sandy clay		D				
4200	End of hole, refusal on rock						
Notes:							

Salinity assessment

Client: Maas Group Properties Pty Ltd		Job no: 7891	Date: 10/01/2017
Address:	Lot 2 DP880413 Sheraton Road, Dubbo		
Borehole: 12		GPS: 55H 655067mE 6427703mN	

Surface description

Slope:	0-1%	Aspect:	East
Morphological type:	Mid-slope		
Land-use:	Grazing		
Disturbance:	High		
Erosion:	Nil		
Coarse fragments:	Nil		
Surface cover:	Rye grass, hedge mustard		
% surface cover	100%		
Salinity:	Nil		

Sub-surface description

Sample method: EVH		Logged by: LD					
Depth (mm)	Soil description (texture, colour, coarse fragments, mottles, roots, structure)	Sample	M/D	pH (1:5 water)	EC (dS/m)	ECe	Emerson aggregate test
0 to 100	Dusky red loamy fine sand	X	M	5.4	0.02	0.19	2
100 to 200	Dusky red sandy clay loam	X	M	5.8	0.02	0.19	1
200 to 800	Dark red silty clay	X	M	6.4	0.01	0.08	1
		X		6.6	0.01	0.08	3
800 to 2400	Reddish brown to yellowish red	X	M	7.3	0.02	0.15	5
	silty clay	X		7.3	0.02	0.15	3
		X		7.3	0.02	0.15	3
		X		7.5	0.02	0.15	2
2700 to 4400	Strong brown sandy clay with	X		6.6	0.02	0.15	2
	gravel. Gravel abundance	X	M	6.8	0.02	0.15	2
	increasing with depth.	X		6.3	0.02	0.15	2
4400 to 5000	Dark brown sandy clay with	X		6.8	0.02	0.15	2
	increasing gravel	X	M	7.0	0.02	0.15	2
5000	End of hole, refusal on rock						

Notes:

Salinity assessment

Client: Maas Group Properties Pty Ltd		Job no: 7891	Date: 10/01/2017
Address:	Lot 2 DP880413 Sheraton Road, Dubbo		
Borehole: 13		GPS: 55H 655050mE 6427465mN	

Surface description

Slope:	0-1%	Aspect:	South
Morphological type:	Mid-slope		
Land-use:	Grazing		
Disturbance:	High		
Erosion:	Nil		
Coarse fragments:	Nil		
Surface cover:	Wild oats, Paterson's curse		
% surface cover	100%		
Salinity:	Nil		

Sub-surface description

Sample method: EVH		Logged by: DL					
Depth (mm)	Soil description (texture, colour, coarse fragments, mottles, roots, structure)	Sample	M/D	pH (1:5 water)	EC (dS/m)	ECe	Emerson aggregate test
0 to 400	Brown loamy sand		D				
400 to 1000	Brownish red silty clay		D				
1000 to 1500	Yellowish brown sandy clay with trace mottles and gravel		D				
1500 to 1700	Light yellowish brown loamy sand (weathered rock)	X	D	8.9	0.16	3.68	3
1700	End of hole, refusal on rock						
Notes:							

Salinity assessment

Client: Maas Group Properties Pty Ltd		Job no: 7891	Date: 10/01/2017
Address:	Lot 2 DP880413 Sheraton Road, Dubbo		
Borehole: 14		GPS: 55H 654921mE 6427500mN	

Surface description

Slope:	0-3%	Aspect:	South
Morphological type:	Mid-slope		
Land-use:	Grazing		
Disturbance:	High		
Erosion:	Nil		
Coarse fragments:	Nil		
Surface cover:	Wild oats, juncus, Paterson's curse		
% surface cover	100%		
Salinity:	Nil		

Sub-surface description

Sample method: EVH		Logged by: DL					
Depth (mm)	Soil description (texture, colour, coarse fragments, mottles, roots, structure)	Sample	M/D	pH (1:5 water)	EC (dS/m)	ECe	Emerson aggregate test
0 to 500	Reddish brown silty clay		D				
500 to 900	Brownish grey silty clay with trace gravel and sand		D				
900 to 1000	Orange silty sand with weathered rock		D				
1000	End of hole, refusal on rock						
Notes:							

Salinity assessment

Client: Maas Group Properties Pty Ltd		Job no: 7891	Date: 10/01/2017
Address:	Lot 2 DP880413 Sheraton Road, Dubbo		
Borehole:	15	GPS:	55H 654732mE 6427557mN

Surface description

Slope:	0-3%	Aspect:	South west
Morphological type:	Mid-slope		
Land-use:	Grazing		
Disturbance:	High		
Erosion:	Nil		
Coarse fragments:	Cobbles and ironstone gravel		
Surface cover:	Wild oats, Paterson's curse		
% surface cover	90%		
Salinity:	Nil		

Sub-surface description

Sample method: EVH		Logged by: DL					
Depth (mm)	Soil description (texture, colour, coarse fragments, mottles, roots, structure)	Sample	M/D	pH (1:5 water)	EC (dS/m)	ECe	Emerson aggregate test
0 to 600	Dark red loamy sand with increasing gravel		D				
600 to 1100	Dark red/brown sandy clay		D				
1100 to 2700	Yellowish brown sandy clay with cobbles		M				
2700 to 2900	Pinkish grey silty loam with grey mottles (weathered rock)	X	D	8.6	0.11	1.05	1
2900	End of hole, drill refusal						
Notes:							

Salinity assessment

Client: Maas Group Properties Pty Ltd		Job no: 7891	Date: 10/01/2017
Address:	Lot 2 DP880413 Sheraton Road, Dubbo		
Borehole: 16		GPS: 55H 654745mE 6427358mN	

Surface description

Slope:	0-1%	Aspect:	South west
Morphological type:	Mid-slope		
Land-use:	Grazing		
Disturbance:	High		
Erosion:	Nil		
Coarse fragments:	Nil		
Surface cover:	Lucerne, wild oats		
% surface cover	100%		
Salinity:	Nil		

Sub-surface description

Sample method: EVH		Logged by: DL					
Depth (mm)	Soil description (texture, colour, coarse fragments, mottles, roots, structure)	Sample	M/D	pH (1:5 water)	EC (dS/m)	ECe	Emerson aggregate test
0 to 1800	Brown to reddish brown loamy sand	X	M	4.9	0.03	0.69	2
		X		5.0	0.03	0.69	2
		X		5.7	0.02	0.46	2
		X		8.3	0.08	1.84	2
1800 to 2800	Reddish brown clayey sand with trace mottles	X	D	8.5	0.27	6.21	2
2800 to 3400	Brown sandy clay with trace mottles	X	D	8.4	0.29	2.18	2
3400 to 5600	Light grey to reddish grey clayey sand to sandy clay	X	D	9.5	0.41	9.43	2
		X		9.3	0.40	3.00	2
		X		9.2	0.32	3.04	2
		X		9.5	0.34	7.82	2
		X		9.3	0.31	2.67	2
5600	End of hole, drill refusal						

Notes:

Salinity assessment

Client: Maas Group Properties Pty Ltd		Job no: 7891	Date: 10/01/2017
Address:	Lot 2 DP880413 Sheraton Road, Dubbo		
Borehole: 17		GPS: 55H 654886mE 6427356mN	

Surface description

Slope:	0-1%	Aspect:	South
Morphological type:	Mid-slope		
Land-use:	Grazing		
Disturbance:	High		
Erosion:	Nil		
Coarse fragments:	Nil		
Surface cover:	Paterson's curse, Lucerne, wild oats		
% surface cover	100%		
Salinity:	Nil		

Sub-surface description

Sample method: EVH		Logged by: DL					
Depth (mm)	Soil description (texture, colour, coarse fragments, mottles, roots, structure)	Sample	M/D	pH (1:5 water)	EC (dS/m)	ECe	Emerson aggregate test
0 to 400	Dark brown silty clay loam		D				
400 to 600	Dark reddish brown silty clay with fine gravel		D				
600 to 1100	Light grey fine sandy clay loam (weathered rock)	X	D	7.6	0.04	0.34	3
1100	End of hole, refusal on rock						
Notes:							

Salinity assessment

Client: Maas Group Properties Pty Ltd		Job no: 7891	Date: 10/01/2017
Address:	Lot 2 DP880413 Sheraton Road, Dubbo		
Borehole: 18		GPS: 55H 655031mE 6427311mN	

Surface description

Slope:	0-1%	Aspect:	South
Morphological type:	Mid-slope		
Land-use:	Grazing		
Disturbance:	High		
Erosion:	Nil		
Coarse fragments:	Nil		
Surface cover:	Lucerne, Paterson's curse		
% surface cover	100%		
Salinity:	Nil		

Sub-surface description

Sample method: EVH		Logged by: DL					
Depth (mm)	Soil description (texture, colour, coarse fragments, mottles, roots, structure)	Sample	M/D	pH (1:5 water)	EC (dS/m)	ECe	Emerson aggregate test
0 to 400	Brown loamy sand		D				
400 to 700	Grey sandy clay		M				
700 to 1400	Pale yellow sand	X	D	7.3	0.02	0.46	2
1400 to 1500	Brownish red silty gravel		D				
1500	End of hole, refusal on rock						
Notes:							

Salinity assessment

Client: Maas Group Properties Pty Ltd		Job no: 7891	Date: 10/01/2017
Address:	Lot 2 DP880413 Sheraton Road, Dubbo		
Borehole:	19	GPS:	55H 655013mE 6427238mN

Surface description

Slope:	0-1%	Aspect:	South
Morphological type:	Mid-slope		
Land-use:	Grazing		
Disturbance:	High		
Erosion:	Nil		
Coarse fragments:	Surface rocks		
Surface cover:	Wild oats, Paterson's curse		
% surface cover	100%		
Salinity:	Nil		

Sub-surface description

Sample method: EVH		Logged by: DL					
Depth (mm)	Soil description (texture, colour, coarse fragments, mottles, roots, structure)	Sample	M/D	pH (1:5 water)	EC (dS/m)	ECe	Emerson aggregate test
0 to 400	Brown loamy sand		D				
400 to 900	Grey/red sandy clay		M				
900 to 1000	Red loamy sand		D				
1000 to 2500	Pale yellow to light grey silty clay	X	D	9.6	0.38	2.85	3
	to sandy clay (weathered rock)	X		8.9	0.12	0.90	2
2500	End of hole, drill refusal						
Notes:							

Salinity assessment

Client: Maas Group Properties Pty Ltd		Job no: 7891	Date: 11/01/2017
Address:	Lot 2 DP880413 Sheraton Road, Dubbo		
Borehole:	20	GPS: 55H 654843mE 6427225mN	

Surface description

Slope:	1%	Aspect:	South west
Morphological type:	Mid-slope		
Land-use:	Grazing		
Disturbance:	High		
Erosion:	Nil		
Coarse fragments:	Trace cobbles		
Surface cover:	Lucerne, wild oats, pasture grasses		
% surface cover	100%		
Salinity:	Nil		

Sub-surface description

Sample method: EVH		Logged by: LD					
Depth (mm)	Soil description (texture, colour, coarse fragments, mottles, roots, structure)	Sample	M/D	pH (1:5 water)	EC (dS/m)	ECe	Emerson aggregate test
0 to 300	Dark brown loamy sand	X	M	5.9	0.03	0.69	3
		X	M	6.6	0.03	0.69	2
		X		6.9	0.03	0.69	2
300 to 1600	Reddish brown to strong brown	X	M	9.0	0.11	0.83	2
	sandy clay to light clay	X		9.5	0.53	3.98	3
		X		9.5	0.56	4.20	2
1600 to 2300	Strong brown sandy clay	X	M	9.3	0.52	3.90	2
2300 to 3300	Grey brown silty clay with fine	X		9.0	0.57	4.28	2
	gravel	X		9.4	0.60	4.50	2
3300 to 4900	Strong brown sandy clay with	X	D	9.4	0.55	4.20	2
	course gravel from 3600	X		9.6	0.55	4.13	2
	including alluvial gravel	X		9.7	0.52	3.90	2
		X	M	9.7	0.45	3.38	2
4900	End of hole, refusal on rock						

Notes:

Salinity assessment

Client: Maas Group Properties Pty Ltd			Job no: 7891	Date:	11/01/2017
Address:	Lot 2 DP880413 Sheraton Road, Dubbo				
Borehole:	21	GPS:	55H 654672mE 6427280mN		

Surface description

Slope:	0-1%	Aspect:	South west
Morphological type:	Mid-slope		
Land-use:	Grazing		
Disturbance:	High		
Erosion:	Nil		
Coarse fragments:	Nil		
Surface cover:	Lucerne and wild oats		
% surface cover	100%		
Salinity:	Nil		

Sub-surface description

Sample method: EVH		Logged by: DL					
Depth (mm)	Soil description (texture, colour, coarse fragments, mottles, roots, structure)	Sample	M/D	pH (1:5 water)	EC (dS/m)	ECe	Emerson aggregate test
0 to 500	Brownish red sandy loam		D				
500 to 1100	Dark reddish brown red sandy clay with trace gravel		D				
1100 to 2000	Yellow/brown silty clay with gravel		D				
2000	End of hole						
Notes:							

Salinity assessment

Client: Maas Group Properties Pty Ltd		Job no: 7891	Date: 10/01/2017
Address:	Lot 2 DP880413 Sheraton Road, Dubbo		
Borehole:	22	GPS:	55H 654691mE 6427080mN

Surface description

Slope:	4%	Aspect:	South west
Morphological type:	Lower slope		
Land-use:	Grazing		
Disturbance:	High		
Erosion:	Nil		
Coarse fragments:	Nil		
Surface cover:	Wild oats, hedge mustard, Paterson's curse, Lucerne, saffron thistle		
% surface cover	100%		
Salinity:	Nil		

Sub-surface description

Sample method: EVH		Logged by: DL					
Depth (mm)	Soil description (texture, colour, coarse fragments, mottles, roots, structure)	Sample	M/D	pH (1:5 water)	EC (dS/m)	ECe	Emerson aggregate test
0 to 800	Brown loamy sand with cobble at 300mm		M				
800 to 1500	Red sandy clay cobbles at 1500mm		M				
1500 to 1900	Brown sandy clay with gravel		D				
1900	End of hole, refusal on rock						
Notes:							

Salinity assessment

Client: Maas Group Properties Pty Ltd		Job no: 7891	Date: 10/01/2017
Address:	Lot 2 DP880413 Sheraton Road, Dubbo		
Borehole:	23	GPS:	55H 654796mE 6427052mN

Surface description

Slope:	0-1%	Aspect:	West
Morphological type:	Mid-slope		
Land-use:	Grazing		
Disturbance:	High		
Erosion:	Nil		
Coarse fragments:	Nil		
Surface cover:	Spear grass, wild oats, lucerne, hedge mustard, umbrella grass, campulana, Paterson's curse, yellow flowered pea, paper daisy, saffron thistle		
% surface cover	100%		
Salinity:	Nil		

Sub-surface description

Sample method: EVH		Logged by: DL					
Depth (mm)	Soil description (texture, colour, coarse fragments, mottles, roots, structure)	Sample	M/D	pH (1:5 water)	EC (dS/m)	ECe	Emerson aggregate test
0 to 400	Brown loamy sand		M				
400 to 2000	Red sandy clay		M				
2000	End of hole						
Notes:							

Salinity assessment

Client: Maas Group Properties Pty Ltd		Job no: 7891	Date: 10/01/2017
Address:	Lot 2 DP880413 Sheraton Road, Dubbo		
Borehole: 24		GPS: 55H 654945mE 6427042mN	

Surface description

Slope:	2%	Aspect:	South
Morphological type:	Mid-slope		
Land-use:	Grazing		
Disturbance:	High		
Erosion:	Nil		
Coarse fragments:	Surface rocks		
Surface cover:	Umbrella grass, couch grass, wild oats, hedge mustard		
% surface cover	90%		
Salinity:	Nil		

Sub-surface description

Sample method: EVH		Logged by: DL					
Depth (mm)	Soil description (texture, colour, coarse fragments, mottles, roots, structure)	Sample	M/D	pH (1:5 water)	EC (dS/m)	ECe	Emerson aggregate test
0 to 400	FILL – Pale grey gravelly loam		M				
400 to 600	Brown sandy loam		M				
600 to 1100	Brown sandy clay		M				
1100 to 2000	Reddish brown sandy clay with gravel from 2000mm		M				
2000 to 2900	Brown sandy clay with gravel		M				
2900	End of hole, drill refusal						
Notes:							

Salinity assessment

Client: Maas Group Properties Pty Ltd			Job no: 7891	Date:	10/01/2017
Address:	Lot 2 DP880413 Sheraton Road, Dubbo				
Borehole:	25	GPS:	55H 654928mE 6426860mN		

Surface description

Slope:	1-2%	Aspect:	North west
Morphological type:	Lower-slope		
Land-use:	Grazing		
Disturbance:	High		
Erosion:	Nil		
Coarse fragments:	Nil		
Surface cover:	Wild oats, hedge mustard, wild lettuce, saffron thistle, spear grass		
% surface cover	100%		
Salinity:	Nil		

Sub-surface description

Sample method: EVH		Logged by: DL					
Depth (mm)	Soil description (texture, colour, coarse fragments, mottles, roots, structure)	Sample	M/D	pH (1:5 water)	EC (dS/m)	ECe	Emerson aggregate test
0 to 300	Brown loamy sand		M				
300 to 500	Reddish brown sandy clay loam		M				
500 to 2500	Red sandy clay		M				
2500 to 3000	Brown sandy clay		M				
3000	End of hole						
Notes:							

Salinity assessment

Client: Maas Group Properties Pty Ltd		Job no: 7891	Date: 10/01/2017
Address:	Lot 2 DP880413 Sheraton Road, Dubbo		
Borehole: 26		GPS: 55H 654673mE 6426990mN	

Surface description

Slope:	0-1%	Aspect:	South west
Morphological type:	Mid-slope		
Land-use:	Grazing		
Disturbance:	High		
Erosion:	Nil		
Coarse fragments:	Nil		
Surface cover:	Wild oats, Lucerne, hedge mustard, nightshade		
% surface cover	100%		
Salinity:	Nil		

Sub-surface description

Sample method: EVH		Logged by: DL					
Depth (mm)	Soil description (texture, colour, coarse fragments, mottles, roots, structure)	Sample	M/D	pH (1:5 water)	EC (dS/m)	ECe	Emerson aggregate test
0 to 100	Brown sandy loam		M				
100 to 600	Reddish brown sandy loam		M				
600 to 1700	Dark grey brown sandy clay with coarse sand and trace fine alluvial gravel from 1000mm		D				
1700 to 2400	Reddish brown sandy clay with coarse sand and trace fine alluvial gravel		D				
2400 to 2600	Dark brown sandy clay		D				
2600	End of hole, refusal on rock						
Notes:							

Salinity assessment

Client: Maas Group Properties Pty Ltd		Job no: 7891	Date: 10/01/2017
Address:	Lot 2 DP880413 Sheraton Road, Dubbo		
Borehole: 27		GPS: 55H 654819mE 6426972mN	

Surface description

Slope:	0-1%	Aspect:	South west
Morphological type:	Mid-slope		
Land-use:	Grazing		
Disturbance:	High		
Erosion:	Nil		
Coarse fragments:	Nil		
Surface cover:	Lucerne, wild oats		
% surface cover	100%		
Salinity:	Nil		

Sub-surface description

Sample method: EVH		Logged by: DL					
Depth (mm)	Soil description (texture, colour, coarse fragments, mottles, roots, structure)	Sample	M/D	pH (1:5 water)	EC (dS/m)	ECe	Emerson aggregate test
0 to 400	Strong brown loamy sand with trace gravel	X	D	6.0	0.03	0.69	3
		X		5.7	0.02	0.46	3
		X		6.1	0.02	0.46	3
400 to 800	Dark reddish brown sandy clay loam	X	D	6.6	0.03	0.19	3
800 to 1800	Dark red light clay with trace basalt cobbles	X	M	6.7	0.01	0.08	3
		X		6.9	0.01	0.08	3
1800 to 2500	Reddish brown to brown loamy sand with weathered rock horizon	X	D	6.7	0.02	0.46	3
		X		7.3	0.02	0.46	3
2500 to 3100	Brown loamy sand with clay and cobbles	X	M	7.5	0.02	0.46	3
3100 to 3900	Dark brown clayey sand with gravel and trace clay and cobbles	X	M	7.7	0.02	0.46	3
3900	End of hole, refusal on rock						

Notes:

Appendix 7. Reference methods for soil testing

Reference Methods:

Colour: Munsell (2000) In 'Munsell Soil Colour Charts' (Gretag Macbeth: NY)

Field texture: McDonald RC, Isbell RF, Speight JG, Walker, Hopkins MS (1990) Australian Soil and Land Survey Field Handbook pp.115-124 (Inkata Press: Melbourne)

PH: AS1289.4.3.1-1997 Method of testing soil for engineering purposes – Soil Chemical Tests-Determination of the pH value of a soil – Electrometric method

Salinity: Rayment GE and Higginson FR (1992) Australian Laboratory Handbook of Soil and Water Chemical Methods (Method 3A1, pp.15-16) (Inkata Press Melbourne) Electrical conductivity of saturated extract is based on conversions of EC (1:5) and soil texture class, to give a more accurate assessment of soil salinity hazard (Salavich PG and Peterson GH (1993) Estimating the electrical conductivity of soil paste extracts from 1:5 soil water suspensions and texture. Australian Journal of Soil Research 31, 3-81)

Appendix 8. SGS laboratory report SE160957 and chain of custody form

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Ashleigh Pickering
Client	ENVIROWEST CONSULTING PTY LIMITED
Address	PO BOX 8158 ORANGE NSW 2800
Telephone	61 2 63614954
Facsimile	(Not specified)
Email	ashleigh@envirowest.net.au
Project	**7891**
Order Number	(Not specified)
Samples	42

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE160957 R0**
Date Received	17/1/2017
Date Reported	24/1/2017

COMMENTS

Accredited for compliance with ISO/IEC 17025. NATA accredited laboratory 2562(4354).

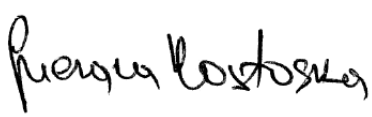
SIGNATORIES

Bennet Lo
Senior Organic Chemist/Metals Chemist

Dong Liang
Metals/Inorganics Team Leader

Kamrul Ahsan
Senior Chemist

Ly Kim Ha
Organic Section Head



Snezana Kostoska
2IC Inorganics Chemist

VOC's in Soil [AN433] Tested: 19/1/2017

PARAMETER	UOM	LOR	SR27 SOIL - 11/1/2017 SE160957.027	SR28 SOIL - 11/1/2017 SE160957.028	SR29 SOIL - 11/1/2017 SE160957.029	SR30 SOIL - 11/1/2017 SE160957.030	SR31 SOIL - 11/1/2017 SE160957.031
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes*	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	SR32 SOIL - 12/1/2017 SE160957.032	SR33 SOIL - 12/1/2017 SE160957.033
Benzene	mg/kg	0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1
Total Xylenes*	mg/kg	0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 19/1/2017

PARAMETER	UOM	LOR	SR27 SOIL - 11/1/2017 SE160957.027	SR28 SOIL - 11/1/2017 SE160957.028	SR29 SOIL - 11/1/2017 SE160957.029	SR30 SOIL - 11/1/2017 SE160957.030	SR31 SOIL - 11/1/2017 SE160957.031
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	SR32 SOIL - 12/1/2017 SE160957.032	SR33 SOIL - 12/1/2017 SE160957.033
TRH C6-C9	mg/kg	20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 18/1/2017

PARAMETER	UOM	LOR	SR27 SOIL - 11/1/2017 SE160957.027	SR28 SOIL - 11/1/2017 SE160957.028	SR29 SOIL - 11/1/2017 SE160957.029	SR30 SOIL - 11/1/2017 SE160957.030	SR31 SOIL - 11/1/2017 SE160957.031
TRH C10-C14	mg/kg	20	<20	<20	**120**	<20	<20
TRH C15-C28	mg/kg	45	<45	**910**	**3400**	<45	<45
TRH C29-C36	mg/kg	45	<45	**52**	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16 (F2)	mg/kg	25	<25	<25	**450**	<25	<25
TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	<25	**450**	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	**930**	**3100**	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	**960**	**3500**	<110	<110
TRH C10-C40 Total	mg/kg	210	<210	**960**	**3500**	<210	<210

PARAMETER	UOM	LOR	SR32 SOIL - 12/1/2017 SE160957.032	SR33 SOIL - 12/1/2017 SE160957.033
TRH C10-C14	mg/kg	20	<20	<20
TRH C15-C28	mg/kg	45	**140**	<45
TRH C29-C36	mg/kg	45	**51**	<45
TRH C37-C40	mg/kg	100	<100	<100
TRH >C10-C16 (F2)	mg/kg	25	<25	<25
TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	**170**	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120
TRH C10-C36 Total	mg/kg	110	**190**	<110
TRH C10-C40 Total	mg/kg	210	<210	<210

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 18/1/2017

PARAMETER	UOM	LOR	SR27 SOIL - 11/1/2017 SE160957.027	SR28 SOIL - 11/1/2017 SE160957.028	SR29 SOIL - 11/1/2017 SE160957.029	SR30 SOIL - 11/1/2017 SE160957.030	SR31 SOIL - 11/1/2017 SE160957.031
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<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	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8	<0.8

PARAMETER	UOM	LOR	SR32 SOIL - 12/1/2017 SE160957.032	SR33 SOIL - 12/1/2017 SE160957.033
Naphthalene	mg/kg	0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ	0.2	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	<0.8

OC Pesticides in Soil [AN420] Tested: 18/1/2017

PARAMETER	UOM	LOR	SR27 SOIL - 11/1/2017 SE160957.027	SR28 SOIL - 11/1/2017 SE160957.028	SR29 SOIL - 11/1/2017 SE160957.029	SR30 SOIL - 11/1/2017 SE160957.030	SR31 SOIL - 11/1/2017 SE160957.031
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

OC Pesticides in Soil [AN420] Tested: 18/1/2017 (continued)

PARAMETER	UOM	LOR	SR32 SOIL - 12/1/2017 SE160957.032	SR33 SOIL - 12/1/2017 SE160957.033	SR73 SOIL - 11/1/2017 SE160957.034	SR91 SOIL - 11/1/2017 SE160957.035	SR113 SOIL - 11/1/2017 SE160957.036
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

OC Pesticides in Soil [AN420] Tested: 18/1/2017 (continued)

PARAMETER	UOM	LOR	SR184 SOIL - 11/1/2017 SE160957.037	SR224 SOIL - 11/1/2017 SE160957.038
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR) [AN122] Tested: 23/1/2017

PARAMETER	UOM	LOR	BH16-100 SOIL - 11/1/2017 SE160957.041	BH16-1500 SOIL - 11/1/2017 SE160957.042
Exchangeable Sodium, Na	mg/kg	2	**17**	**530**
Exchangeable Sodium, Na	meq/100g	0.01	**0.07**	**2.3**
Exchangeable Sodium Percentage*	%	0.1	**3.3**	**36.5**

Soluble Anions (1:5) in Soil by Ion Chromatography [AN245] Tested: 19/1/2017

PARAMETER	UOM	LOR	BH16-100 SOIL - 11/1/2017 SE160957.041	BH16-1500 SOIL - 11/1/2017 SE160957.042
Chloride	mg/kg	0.25	**7.6**	**50**

Total Recoverable Metals in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 23/1/2017

PARAMETER	UOM	LOR	SR1 SOIL - 11/1/2017 SE160957.001	SR2 SOIL - 11/1/2017 SE160957.002	SR3 SOIL - 11/1/2017 SE160957.003	SR4 SOIL - 11/1/2017 SE160957.004	SR5 SOIL - 11/1/2017 SE160957.005
Arsenic, As	mg/kg	3	<3	<3	<3	<3	<3
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.3	19	18	20	11	18
Copper, Cu	mg/kg	0.5	6.7	6.0	5.5	4.2	6.8
Lead, Pb	mg/kg	1	5	6	5	4	6
Nickel, Ni	mg/kg	0.5	9.8	8.5	8.5	5.1	7.6
Zinc, Zn	mg/kg	0.5	14	18	13	9.6	13
Calcium, Ca	mg/kg	5	-	-	-	-	-
Magnesium, Mg	mg/kg	5	-	-	-	-	-
Sodium, Na	mg/kg	5	-	-	-	-	-
Potassium, K	mg/kg	10	-	-	-	-	-

PARAMETER	UOM	LOR	SR6 SOIL - 11/1/2017 SE160957.006	SR7 SOIL - 11/1/2017 SE160957.007	SR8 SOIL - 11/1/2017 SE160957.008	SR9 SOIL - 11/1/2017 SE160957.009	SR10 SOIL - 11/1/2017 SE160957.010
Arsenic, As	mg/kg	3	<3	<3	<3	<3	<3
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.3	19	11	23	36	9.9
Copper, Cu	mg/kg	0.5	7.5	5.1	7.3	7.1	3.2
Lead, Pb	mg/kg	1	6	5	6	8	4
Nickel, Ni	mg/kg	0.5	10	4.6	9.5	14	3.1
Zinc, Zn	mg/kg	0.5	15	12	14	22	6.2
Calcium, Ca	mg/kg	5	-	-	-	-	-
Magnesium, Mg	mg/kg	5	-	-	-	-	-
Sodium, Na	mg/kg	5	-	-	-	-	-
Potassium, K	mg/kg	10	-	-	-	-	-

PARAMETER	UOM	LOR	SR11 SOIL - 11/1/2017 SE160957.011	SR12 SOIL - 11/1/2017 SE160957.012	SR13 SOIL - 11/1/2017 SE160957.013	SR14 SOIL - 11/1/2017 SE160957.014	SR15 SOIL - 11/1/2017 SE160957.015
Arsenic, As	mg/kg	3	<3	<3	<3	<3	<3
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.3	9.2	11	16	58	50
Copper, Cu	mg/kg	0.5	3.9	4.8	6.5	18	17
Lead, Pb	mg/kg	1	5	5	6	9	9
Nickel, Ni	mg/kg	0.5	4.4	7.0	11	41	34
Zinc, Zn	mg/kg	0.5	7.4	8.9	14	45	31
Calcium, Ca	mg/kg	5	-	-	-	-	-
Magnesium, Mg	mg/kg	5	-	-	-	-	-
Sodium, Na	mg/kg	5	-	-	-	-	-
Potassium, K	mg/kg	10	-	-	-	-	-

Total Recoverable Metals in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 23/1/2017 (continued)

PARAMETER	UOM	LOR	SR16 SOIL - 11/1/2017 SE160957.016	SR17 SOIL - 11/1/2017 SE160957.017	SR18 SOIL - 11/1/2017 SE160957.018	SR19 SOIL - 11/1/2017 SE160957.019	SR20 SOIL - 11/1/2017 SE160957.020
Arsenic, As	mg/kg	3	<3	<3	<3	<3	<3
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.3	41	36	36	24	27
Copper, Cu	mg/kg	0.5	14	13	12	11	11
Lead, Pb	mg/kg	1	8	11	8	8	7
Nickel, Ni	mg/kg	0.5	25	20	17	16	16
Zinc, Zn	mg/kg	0.5	23	21	22	24	22
Calcium, Ca	mg/kg	5	-	-	-	-	-
Magnesium, Mg	mg/kg	5	-	-	-	-	-
Sodium, Na	mg/kg	5	-	-	-	-	-
Potassium, K	mg/kg	10	-	-	-	-	-

PARAMETER	UOM	LOR	SR21 SOIL - 11/1/2017 SE160957.021	SR22 SOIL - 11/1/2017 SE160957.022	SR23 SOIL - 11/1/2017 SE160957.023	SR24 SOIL - 11/1/2017 SE160957.024	SR25 SOIL - 11/1/2017 SE160957.025
Arsenic, As	mg/kg	3	<3	<3	<3	<3	<3
Cadmium, Cd	mg/kg	0.3	<0.3	0.3	0.4	0.4	<0.3
Chromium, Cr	mg/kg	0.3	41	65	59	63	40
Copper, Cu	mg/kg	0.5	13	18	20	20	15
Lead, Pb	mg/kg	1	7	9	9	9	9
Nickel, Ni	mg/kg	0.5	24	42	52	50	32
Zinc, Zn	mg/kg	0.5	25	35	41	40	29
Calcium, Ca	mg/kg	5	-	-	-	-	-
Magnesium, Mg	mg/kg	5	-	-	-	-	-
Sodium, Na	mg/kg	5	-	-	-	-	-
Potassium, K	mg/kg	10	-	-	-	-	-

PARAMETER	UOM	LOR	SR26 SOIL - 11/1/2017 SE160957.026	SR27 SOIL - 11/1/2017 SE160957.027	SR28 SOIL - 11/1/2017 SE160957.028	SR29 SOIL - 11/1/2017 SE160957.029	SR30 SOIL - 11/1/2017 SE160957.030
Arsenic, As	mg/kg	3	<3	<3	<3	<3	<3
Cadmium, Cd	mg/kg	0.3	0.4	0.4	0.3	0.4	0.3
Chromium, Cr	mg/kg	0.3	67	58	50	63	64
Copper, Cu	mg/kg	0.5	22	23	19	26	22
Lead, Pb	mg/kg	1	10	11	10	8	9
Nickel, Ni	mg/kg	0.5	52	62	40	83	48
Zinc, Zn	mg/kg	0.5	59	64	58	50	49
Calcium, Ca	mg/kg	5	-	-	-	-	-
Magnesium, Mg	mg/kg	5	-	-	-	-	-
Sodium, Na	mg/kg	5	-	-	-	-	-
Potassium, K	mg/kg	10	-	-	-	-	-

Total Recoverable Metals in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 23/1/2017 (continued)

PARAMETER	UOM	LOR	SR31 SOIL - 11/1/2017 SE160957.031	SR32 SOIL - 12/1/2017 SE160957.032	SR33 SOIL - 12/1/2017 SE160957.033	SRA SOIL - 11/1/2017 SE160957.039	SRB SOIL - 11/1/2017 SE160957.040
Arsenic, As	mg/kg	3	<3	<3	<3	<3	<3
Cadmium, Cd	mg/kg	0.3	<0.3	**0.3**	**0.3**	<0.3	<0.3
Chromium, Cr	mg/kg	0.3	**49**	**53**	**59**	**21**	**9.7**
Copper, Cu	mg/kg	0.5	**21**	**22**	**22**	**6.0**	**3.4**
Lead, Pb	mg/kg	1	**10**	**10**	**10**	**5**	**4**
Nickel, Ni	mg/kg	0.5	**41**	**50**	**48**	**8.3**	**2.9**
Zinc, Zn	mg/kg	0.5	**58**	**40**	**44**	**17**	**5.1**
Calcium, Ca	mg/kg	5	-	-	-	-	-
Magnesium, Mg	mg/kg	5	-	-	-	-	-
Sodium, Na	mg/kg	5	-	-	-	-	-
Potassium, K	mg/kg	10	-	-	-	-	-

PARAMETER	UOM	LOR	BH16-100 SOIL - 11/1/2017 SE160957.041	BH16-1500 SOIL - 11/1/2017 SE160957.042
Arsenic, As	mg/kg	3	-	-
Cadmium, Cd	mg/kg	0.3	-	-
Chromium, Cr	mg/kg	0.3	-	-
Copper, Cu	mg/kg	0.5	-	-
Lead, Pb	mg/kg	1	-	-
Nickel, Ni	mg/kg	0.5	-	-
Zinc, Zn	mg/kg	0.5	-	-
Calcium, Ca	mg/kg	5	**180**	**230**
Magnesium, Mg	mg/kg	5	**190**	**590**
Sodium, Na	mg/kg	5	**22**	**450**
Potassium, K	mg/kg	10	**590**	**360**

Mercury in Soil [AN312] Tested: 20/1/2017

PARAMETER	UOM	LOR	SR27 SOIL - 11/1/2017 SE160957.027	SR28 SOIL - 11/1/2017 SE160957.028	SR29 SOIL - 11/1/2017 SE160957.029	SR30 SOIL - 11/1/2017 SE160957.030	SR31 SOIL - 11/1/2017 SE160957.031
Mercury	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05

PARAMETER	UOM	LOR	SR32 SOIL - 12/1/2017 SE160957.032	SR33 SOIL - 12/1/2017 SE160957.033
Mercury	mg/kg	0.05	<0.05	<0.05

Moisture Content [AN002] Tested: 20/1/2017

PARAMETER	UOM	LOR	SR1 SOIL - 11/1/2017 SE160957.001	SR2 SOIL - 11/1/2017 SE160957.002	SR3 SOIL - 11/1/2017 SE160957.003	SR4 SOIL - 11/1/2017 SE160957.004	SR5 SOIL - 11/1/2017 SE160957.005
% Moisture	%w/w	0.5	8.7	4.9	4.0	9.1	5.6

PARAMETER	UOM	LOR	SR6 SOIL - 11/1/2017 SE160957.006	SR7 SOIL - 11/1/2017 SE160957.007	SR8 SOIL - 11/1/2017 SE160957.008	SR9 SOIL - 11/1/2017 SE160957.009	SR10 SOIL - 11/1/2017 SE160957.010
% Moisture	%w/w	0.5	7.7	3.5	6.5	3.5	2.0

PARAMETER	UOM	LOR	SR11 SOIL - 11/1/2017 SE160957.011	SR12 SOIL - 11/1/2017 SE160957.012	SR13 SOIL - 11/1/2017 SE160957.013	SR14 SOIL - 11/1/2017 SE160957.014	SR15 SOIL - 11/1/2017 SE160957.015
% Moisture	%w/w	0.5	5.3	3.6	3.2	7.7	8.1

PARAMETER	UOM	LOR	SR16 SOIL - 11/1/2017 SE160957.016	SR17 SOIL - 11/1/2017 SE160957.017	SR18 SOIL - 11/1/2017 SE160957.018	SR19 SOIL - 11/1/2017 SE160957.019	SR20 SOIL - 11/1/2017 SE160957.020
% Moisture	%w/w	0.5	7.1	8.3	6.7	6.3	6.2

PARAMETER	UOM	LOR	SR21 SOIL - 11/1/2017 SE160957.021	SR22 SOIL - 11/1/2017 SE160957.022	SR23 SOIL - 11/1/2017 SE160957.023	SR24 SOIL - 11/1/2017 SE160957.024	SR25 SOIL - 11/1/2017 SE160957.025
% Moisture	%w/w	0.5	5.8	12	7.4	6.4	4.8

PARAMETER	UOM	LOR	SR26 SOIL - 11/1/2017 SE160957.026	SR27 SOIL - 11/1/2017 SE160957.027	SR28 SOIL - 11/1/2017 SE160957.028	SR29 SOIL - 11/1/2017 SE160957.029	SR30 SOIL - 11/1/2017 SE160957.030
% Moisture	%w/w	0.5	8.5	6.3	6.3	4.8	5.7

PARAMETER	UOM	LOR	SR31 SOIL - 11/1/2017 SE160957.031	SR32 SOIL - 12/1/2017 SE160957.032	SR33 SOIL - 12/1/2017 SE160957.033	SR73 SOIL - 11/1/2017 SE160957.034	SR91 SOIL - 11/1/2017 SE160957.035
% Moisture	%w/w	0.5	4.3	5.3	5.7	1.3	5.5

Moisture Content [AN002] Tested: 20/1/2017 (continued)

PARAMETER	UOM	LOR	SR113 SOIL - 11/1/2017 SE160957.036	SR184 SOIL - 11/1/2017 SE160957.037	SR224 SOIL - 11/1/2017 SE160957.038	SRA SOIL - 11/1/2017 SE160957.039	SRB SOIL - 11/1/2017 SE160957.040
% Moisture	%w/w	0.5	2.2	7.9	7.6	5.2	2.2

PARAMETER	UOM	LOR	BH16-100 SOIL - 11/1/2017 SE160957.041	BH16-1500 SOIL - 11/1/2017 SE160957.042
% Moisture	%w/w	0.5	6.3	10

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN040/AN320	A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.
AN122	Exchangeable Cations, CEC and ESP: Soil sample is extracted in 1M Ammonium Acetate at pH=7 (or 1M Ammonium Chloride at pH=7) with cations (Na, K, Ca & Mg) then determined by ICP OES/ICP MS and reported as Exchangeable Cations. For saline soils, these results can be corrected for water soluble cations and reported as Exchangeable cations in meq/100g or soil can be pre-treated (aqueous ethanol/aqueous glycerol) prior to extraction. Cation Exchange Capacity (CEC) is the sum of the exchangeable cations in meq/100g.
AN122	The Exchangeable Sodium Percentage (ESP) is calculated as the exchangeable sodium divided by the CEC (all in meq/100g) times 100. ESP can be used to categorise the sodicity of the soil as below: ESP < 6% non-sodic ESP 6-15% sodic ESP >15% strongly sodic Method is refernced to Rayment and Higginson, 1992, sections 15D3 and 15N1.-
AN245	Anions by Ion Chromatography: A water sample is injected into an eluent stream that passes through the ion chromatographic system where the anions of interest ie Br, Cl, NO2, NO3 and SO4 are separated on their relative affinities for the active sites on the column packing material. Changes to the conductivity and the UV-visible absorbance of the eluent enable identification and quantitation of the anions based on their retention time and peak height or area. APHA 4110 B
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Petroleum Hydrocarbons (TPH) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents.
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
		NVL	Not validated.	LOR	Limit of Reporting.
**	Indicative data, theoretical holding time exceeded.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Samples analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here : http://www.sgs.com.au/~/media/Local/Australia/Documents/Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

STATEMENT OF QA/QC PERFORMANCE

SE160957 R0

CLIENT DETAILS

Contact	Ashleigh Pickering
Client	ENVIROWEST CONSULTING PTY LIMITED
Address	PO BOX 8158 ORANGE NSW 2800
Telephone	61 2 63614954
Facsimile	(Not specified)
Email	ashleigh@envirowest.net.au
Project	**7891**
Order Number	(Not specified)
Samples	42

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE160957 R0**
Date Received	17 Jan 2017
Date Reported	25 Jan 2017

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document and was supplied by the Client.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Matrix Spike	Total Recoverable Metals in Soil/Waste Solids/Materials by ICPOES	1 item
	Total Recoverable Metals in Soil/Waste Solids/Materials by ICPOES	3 items

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	42 Soil
Date documentation received	17/1/2017	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	21.5°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

HOLDING TIME SUMMARY

SE160957 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS “Field Sampling Guide for Containers and Holding Time” (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR)

Method: ME-(AU)-[ENV]AN122

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH16-100	SE160957.041	LB117341	11 Jan 2017	17 Jan 2017	08 Feb 2017	23 Jan 2017	08 Feb 2017	23 Jan 2017
BH16-1500	SE160957.042	LB117341	11 Jan 2017	17 Jan 2017	08 Feb 2017	23 Jan 2017	08 Feb 2017	23 Jan 2017

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SR27	SE160957.027	LB117281	11 Jan 2017	17 Jan 2017	08 Feb 2017	20 Jan 2017	08 Feb 2017	24 Jan 2017
SR28	SE160957.028	LB117281	11 Jan 2017	17 Jan 2017	08 Feb 2017	20 Jan 2017	08 Feb 2017	24 Jan 2017
SR29	SE160957.029	LB117281	11 Jan 2017	17 Jan 2017	08 Feb 2017	20 Jan 2017	08 Feb 2017	24 Jan 2017
SR30	SE160957.030	LB117281	11 Jan 2017	17 Jan 2017	08 Feb 2017	20 Jan 2017	08 Feb 2017	24 Jan 2017
SR31	SE160957.031	LB117281	11 Jan 2017	17 Jan 2017	08 Feb 2017	20 Jan 2017	08 Feb 2017	24 Jan 2017
SR32	SE160957.032	LB117281	12 Jan 2017	17 Jan 2017	09 Feb 2017	20 Jan 2017	09 Feb 2017	24 Jan 2017
SR33	SE160957.033	LB117281	12 Jan 2017	17 Jan 2017	09 Feb 2017	20 Jan 2017	09 Feb 2017	24 Jan 2017

Moisture Content

Method: ME-(AU)-[ENV]AN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SR1	SE160957.001	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR2	SE160957.002	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR3	SE160957.003	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR4	SE160957.004	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR5	SE160957.005	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR6	SE160957.006	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR7	SE160957.007	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR8	SE160957.008	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR9	SE160957.009	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR10	SE160957.010	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR11	SE160957.011	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR12	SE160957.012	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR13	SE160957.013	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR14	SE160957.014	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR15	SE160957.015	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR16	SE160957.016	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR17	SE160957.017	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR18	SE160957.018	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR19	SE160957.019	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR20	SE160957.020	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR21	SE160957.021	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR22	SE160957.022	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR23	SE160957.023	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR24	SE160957.024	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR25	SE160957.025	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR26	SE160957.026	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR27	SE160957.027	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR28	SE160957.028	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR29	SE160957.029	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR30	SE160957.030	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR31	SE160957.031	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR32	SE160957.032	LB117208	12 Jan 2017	17 Jan 2017	26 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR33	SE160957.033	LB117208	12 Jan 2017	17 Jan 2017	26 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR73	SE160957.034	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR91	SE160957.035	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR113	SE160957.036	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR184	SE160957.037	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SR224	SE160957.038	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SRA	SE160957.039	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
SRB	SE160957.040	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
BH16-100	SE160957.041	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017
BH16-1500	SE160957.042	LB117208	11 Jan 2017	17 Jan 2017	25 Jan 2017	20 Jan 2017	25 Jan 2017	23 Jan 2017

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref

HOLDING TIME SUMMARY

SE160957 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS “Field Sampling Guide for Containers and Holding Time” (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

OC Pesticides in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SR27	SE160957.027	LB117067	11 Jan 2017	17 Jan 2017	25 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR28	SE160957.028	LB117067	11 Jan 2017	17 Jan 2017	25 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR29	SE160957.029	LB117067	11 Jan 2017	17 Jan 2017	25 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR30	SE160957.030	LB117067	11 Jan 2017	17 Jan 2017	25 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR31	SE160957.031	LB117067	11 Jan 2017	17 Jan 2017	25 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR32	SE160957.032	LB117067	12 Jan 2017	17 Jan 2017	26 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR33	SE160957.033	LB117067	12 Jan 2017	17 Jan 2017	26 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR73	SE160957.034	LB117067	11 Jan 2017	17 Jan 2017	25 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR91	SE160957.035	LB117067	11 Jan 2017	17 Jan 2017	25 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR113	SE160957.036	LB117067	11 Jan 2017	17 Jan 2017	25 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR184	SE160957.037	LB117067	11 Jan 2017	17 Jan 2017	25 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR224	SE160957.038	LB117067	11 Jan 2017	17 Jan 2017	25 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SR27	SE160957.027	LB117067	11 Jan 2017	17 Jan 2017	25 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR28	SE160957.028	LB117067	11 Jan 2017	17 Jan 2017	25 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR29	SE160957.029	LB117067	11 Jan 2017	17 Jan 2017	25 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR30	SE160957.030	LB117067	11 Jan 2017	17 Jan 2017	25 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR31	SE160957.031	LB117067	11 Jan 2017	17 Jan 2017	25 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR32	SE160957.032	LB117067	12 Jan 2017	17 Jan 2017	26 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR33	SE160957.033	LB117067	12 Jan 2017	17 Jan 2017	26 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR73	SE160957.034	LB117067	11 Jan 2017	17 Jan 2017	25 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR91	SE160957.035	LB117067	11 Jan 2017	17 Jan 2017	25 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR113	SE160957.036	LB117067	11 Jan 2017	17 Jan 2017	25 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR184	SE160957.037	LB117067	11 Jan 2017	17 Jan 2017	25 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR224	SE160957.038	LB117067	11 Jan 2017	17 Jan 2017	25 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017

Soluble Anions (1:5) in Soil by Ion Chromatography

Method: ME-(AU)-[ENV]AN245

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH16-100	SE160957.041	LB117119	11 Jan 2017	17 Jan 2017	18 Jan 2017	18 Jan 2017	15 Feb 2017	18 Jan 2017
BH16-1500	SE160957.042	LB117119	11 Jan 2017	17 Jan 2017	18 Jan 2017	18 Jan 2017	15 Feb 2017	18 Jan 2017

Total Recoverable Metals in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SR1	SE160957.001	LB117335	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SR2	SE160957.002	LB117335	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SR3	SE160957.003	LB117335	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SR4	SE160957.004	LB117335	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SR5	SE160957.005	LB117335	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SR6	SE160957.006	LB117335	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SR7	SE160957.007	LB117335	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SR8	SE160957.008	LB117335	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SR9	SE160957.009	LB117335	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SR10	SE160957.010	LB117335	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SR11	SE160957.011	LB117335	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SR12	SE160957.012	LB117335	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SR13	SE160957.013	LB117335	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SR14	SE160957.014	LB117335	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SR15	SE160957.015	LB117336	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SR16	SE160957.016	LB117336	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SR17	SE160957.017	LB117336	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SR18	SE160957.018	LB117336	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SR19	SE160957.019	LB117336	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SR20	SE160957.020	LB117336	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SR21	SE160957.021	LB117336	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SR22	SE160957.022	LB117336	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SR23	SE160957.023	LB117336	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SR24	SE160957.024	LB117336	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SR25	SE160957.025	LB117336	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SR26	SE160957.026	LB117336	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017

HOLDING TIME SUMMARY

SE160957 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS “Field Sampling Guide for Containers and Holding Time” (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Total Recoverable Metals in Soil/Waste Solids/Materials by ICPOES (continued)

Method: ME-(AU)-[ENV]AN040/AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SR27	SE160957.027	LB117336	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SR28	SE160957.028	LB117336	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SR29	SE160957.029	LB117336	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SR30	SE160957.030	LB117336	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SR31	SE160957.031	LB117336	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SR32	SE160957.032	LB117336	12 Jan 2017	17 Jan 2017	11 Jul 2017	23 Jan 2017	11 Jul 2017	24 Jan 2017
SR33	SE160957.033	LB117336	12 Jan 2017	17 Jan 2017	11 Jul 2017	23 Jan 2017	11 Jul 2017	24 Jan 2017
SRA	SE160957.039	LB117337	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
SRB	SE160957.040	LB117337	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
BH16-100	SE160957.041	LB117337	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017
BH16-1500	SE160957.042	LB117337	11 Jan 2017	17 Jan 2017	10 Jul 2017	23 Jan 2017	10 Jul 2017	24 Jan 2017

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SR27	SE160957.027	LB117067	11 Jan 2017	17 Jan 2017	25 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR28	SE160957.028	LB117067	11 Jan 2017	17 Jan 2017	25 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR29	SE160957.029	LB117067	11 Jan 2017	17 Jan 2017	25 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR30	SE160957.030	LB117067	11 Jan 2017	17 Jan 2017	25 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR31	SE160957.031	LB117067	11 Jan 2017	17 Jan 2017	25 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR32	SE160957.032	LB117067	12 Jan 2017	17 Jan 2017	26 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR33	SE160957.033	LB117067	12 Jan 2017	17 Jan 2017	26 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR73	SE160957.034	LB117067	11 Jan 2017	17 Jan 2017	25 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR91	SE160957.035	LB117067	11 Jan 2017	17 Jan 2017	25 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR113	SE160957.036	LB117067	11 Jan 2017	17 Jan 2017	25 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR184	SE160957.037	LB117067	11 Jan 2017	17 Jan 2017	25 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017
SR224	SE160957.038	LB117067	11 Jan 2017	17 Jan 2017	25 Jan 2017	18 Jan 2017	27 Feb 2017	24 Jan 2017

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SR27	SE160957.027	LB117101	11 Jan 2017	17 Jan 2017	25 Jan 2017	19 Jan 2017	28 Feb 2017	24 Jan 2017
SR28	SE160957.028	LB117101	11 Jan 2017	17 Jan 2017	25 Jan 2017	19 Jan 2017	28 Feb 2017	24 Jan 2017
SR29	SE160957.029	LB117101	11 Jan 2017	17 Jan 2017	25 Jan 2017	19 Jan 2017	28 Feb 2017	24 Jan 2017
SR30	SE160957.030	LB117101	11 Jan 2017	17 Jan 2017	25 Jan 2017	19 Jan 2017	28 Feb 2017	24 Jan 2017
SR31	SE160957.031	LB117101	11 Jan 2017	17 Jan 2017	25 Jan 2017	19 Jan 2017	28 Feb 2017	24 Jan 2017
SR32	SE160957.032	LB117101	12 Jan 2017	17 Jan 2017	26 Jan 2017	19 Jan 2017	28 Feb 2017	24 Jan 2017
SR33	SE160957.033	LB117101	12 Jan 2017	17 Jan 2017	26 Jan 2017	19 Jan 2017	28 Feb 2017	24 Jan 2017

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SR27	SE160957.027	LB117101	11 Jan 2017	17 Jan 2017	25 Jan 2017	19 Jan 2017	28 Feb 2017	24 Jan 2017
SR28	SE160957.028	LB117101	11 Jan 2017	17 Jan 2017	25 Jan 2017	19 Jan 2017	28 Feb 2017	24 Jan 2017
SR29	SE160957.029	LB117101	11 Jan 2017	17 Jan 2017	25 Jan 2017	19 Jan 2017	28 Feb 2017	24 Jan 2017
SR30	SE160957.030	LB117101	11 Jan 2017	17 Jan 2017	25 Jan 2017	19 Jan 2017	28 Feb 2017	24 Jan 2017
SR31	SE160957.031	LB117101	11 Jan 2017	17 Jan 2017	25 Jan 2017	19 Jan 2017	28 Feb 2017	24 Jan 2017
SR32	SE160957.032	LB117101	12 Jan 2017	17 Jan 2017	26 Jan 2017	19 Jan 2017	28 Feb 2017	24 Jan 2017
SR33	SE160957.033	LB117101	12 Jan 2017	17 Jan 2017	26 Jan 2017	19 Jan 2017	28 Feb 2017	24 Jan 2017

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	SR27	SE160957.027	%	60 - 130%	109
	SR28	SE160957.028	%	60 - 130%	115
	SR29	SE160957.029	%	60 - 130%	80
	SR30	SE160957.030	%	60 - 130%	109
	SR31	SE160957.031	%	60 - 130%	105
	SR32	SE160957.032	%	60 - 130%	100
	SR33	SE160957.033	%	60 - 130%	105
	SR73	SE160957.034	%	60 - 130%	105
	SR91	SE160957.035	%	60 - 130%	108
	SR113	SE160957.036	%	60 - 130%	107
	SR184	SE160957.037	%	60 - 130%	107
	SR224	SE160957.038	%	60 - 130%	109

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	SR27	SE160957.027	%	70 - 130%	100
	SR28	SE160957.028	%	70 - 130%	78
	SR29	SE160957.029	%	70 - 130%	110
	SR30	SE160957.030	%	70 - 130%	78
	SR31	SE160957.031	%	70 - 130%	110
	SR32	SE160957.032	%	70 - 130%	80
	SR33	SE160957.033	%	70 - 130%	80
d14-p-terphenyl (Surrogate)	SR27	SE160957.027	%	70 - 130%	92
	SR28	SE160957.028	%	70 - 130%	86
	SR29	SE160957.029	%	70 - 130%	112
	SR30	SE160957.030	%	70 - 130%	78
	SR31	SE160957.031	%	70 - 130%	112
	SR32	SE160957.032	%	70 - 130%	76
	SR33	SE160957.033	%	70 - 130%	94
d5-nitrobenzene (Surrogate)	SR27	SE160957.027	%	70 - 130%	90
	SR28	SE160957.028	%	70 - 130%	74
	SR29	SE160957.029	%	70 - 130%	110
	SR30	SE160957.030	%	70 - 130%	84
	SR31	SE160957.031	%	70 - 130%	112
	SR32	SE160957.032	%	70 - 130%	80
	SR33	SE160957.033	%	70 - 130%	88

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	SR27	SE160957.027	%	60 - 130%	72
	SR28	SE160957.028	%	60 - 130%	71
	SR29	SE160957.029	%	60 - 130%	94
	SR30	SE160957.030	%	60 - 130%	75
	SR31	SE160957.031	%	60 - 130%	77
	SR32	SE160957.032	%	60 - 130%	71
	SR33	SE160957.033	%	60 - 130%	71
d4-1,2-dichloroethane (Surrogate)	SR27	SE160957.027	%	60 - 130%	110
	SR28	SE160957.028	%	60 - 130%	109
	SR29	SE160957.029	%	60 - 130%	104
	SR30	SE160957.030	%	60 - 130%	112
	SR31	SE160957.031	%	60 - 130%	109
	SR32	SE160957.032	%	60 - 130%	109
	SR33	SE160957.033	%	60 - 130%	112
d8-toluene (Surrogate)	SR27	SE160957.027	%	60 - 130%	79
	SR28	SE160957.028	%	60 - 130%	80
	SR29	SE160957.029	%	60 - 130%	75
	SR30	SE160957.030	%	60 - 130%	81
	SR31	SE160957.031	%	60 - 130%	78
	SR32	SE160957.032	%	60 - 130%	76
	SR33	SE160957.033	%	60 - 130%	79
Dibromofluoromethane (Surrogate)	SR27	SE160957.027	%	60 - 130%	96
	SR28	SE160957.028	%	60 - 130%	95

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOC's in Soil (continued)

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Dibromofluoromethane (Surrogate)	SR29	SE160957.029	%	60 - 130%	92
	SR30	SE160957.030	%	60 - 130%	98
	SR31	SE160957.031	%	60 - 130%	98
	SR32	SE160957.032	%	60 - 130%	98
	SR33	SE160957.033	%	60 - 130%	100

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	SR27	SE160957.027	%	60 - 130%	72
	SR28	SE160957.028	%	60 - 130%	71
	SR29	SE160957.029	%	60 - 130%	94
	SR30	SE160957.030	%	60 - 130%	75
	SR31	SE160957.031	%	60 - 130%	77
	SR32	SE160957.032	%	60 - 130%	71
	SR33	SE160957.033	%	60 - 130%	71
d4-1,2-dichloroethane (Surrogate)	SR27	SE160957.027	%	60 - 130%	110
	SR28	SE160957.028	%	60 - 130%	109
	SR29	SE160957.029	%	60 - 130%	104
	SR30	SE160957.030	%	60 - 130%	112
	SR31	SE160957.031	%	60 - 130%	109
	SR32	SE160957.032	%	60 - 130%	109
	SR33	SE160957.033	%	60 - 130%	112
d8-toluene (Surrogate)	SR27	SE160957.027	%	60 - 130%	79
	SR28	SE160957.028	%	60 - 130%	80
	SR29	SE160957.029	%	60 - 130%	75
	SR30	SE160957.030	%	60 - 130%	81
	SR31	SE160957.031	%	60 - 130%	78
	SR32	SE160957.032	%	60 - 130%	76
	SR33	SE160957.033	%	60 - 130%	79
Dibromofluoromethane (Surrogate)	SR27	SE160957.027	%	60 - 130%	96
	SR28	SE160957.028	%	60 - 130%	95
	SR29	SE160957.029	%	60 - 130%	92
	SR30	SE160957.030	%	60 - 130%	98
	SR31	SE160957.031	%	60 - 130%	98
	SR32	SE160957.032	%	60 - 130%	98
	SR33	SE160957.033	%	60 - 130%	100

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR)

Method: ME-(AU)-[ENV]AN122

Sample Number	Parameter	Units	LOR

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result
LB117281.001	Mercury	mg/kg	0.05	<0.05

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB117067.001		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
		Alpha BHC	mg/kg	0.1	<0.1
		Lindane	mg/kg	0.1	<0.1
		Heptachlor	mg/kg	0.1	<0.1
		Aldrin	mg/kg	0.1	<0.1
		Beta BHC	mg/kg	0.1	<0.1
		Delta BHC	mg/kg	0.1	<0.1
		Heptachlor epoxide	mg/kg	0.1	<0.1
		Alpha Endosulfan	mg/kg	0.2	<0.2
		Gamma Chlordane	mg/kg	0.1	<0.1
		Alpha Chlordane	mg/kg	0.1	<0.1
		p,p'-DDE	mg/kg	0.1	<0.1
		Dieldrin	mg/kg	0.2	<0.2
		Endrin	mg/kg	0.2	<0.2
		Beta Endosulfan	mg/kg	0.2	<0.2
		p,p'-DDD	mg/kg	0.1	<0.1
		p,p'-DDT	mg/kg	0.1	<0.1
		Endosulfan sulphate	mg/kg	0.1	<0.1
		Endrin Aldehyde	mg/kg	0.1	<0.1
		Methoxychlor	mg/kg	0.1	<0.1
		Endrin Ketone	mg/kg	0.1	<0.1
		Isodrin	mg/kg	0.1	<0.1
		Mirex	mg/kg	0.1	<0.1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	99

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB117067.001		Naphthalene	mg/kg	0.1	<0.1
		2-methylnaphthalene	mg/kg	0.1	<0.1
		1-methylnaphthalene	mg/kg	0.1	<0.1
		Acenaphthylene	mg/kg	0.1	<0.1
		Acenaphthene	mg/kg	0.1	<0.1
		Fluorene	mg/kg	0.1	<0.1
		Phenanthrene	mg/kg	0.1	<0.1
		Anthracene	mg/kg	0.1	<0.1
		Fluoranthene	mg/kg	0.1	<0.1
		Pyrene	mg/kg	0.1	<0.1
		Benzo(a)anthracene	mg/kg	0.1	<0.1
		Chrysene	mg/kg	0.1	<0.1
		Benzo(a)pyrene	mg/kg	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
		Benzo(ghi)perylene	mg/kg	0.1	<0.1
		Total PAH (18)	mg/kg	0.8	<0.8
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	82
		2-fluorobiphenyl (Surrogate)	%	-	84
		d14-p-terphenyl (Surrogate)	%	-	76

Soluble Anions (1:5) in Soil by Ion Chromatography

Method: ME-(AU)-[ENV]AN245

Sample Number	Parameter	Units	LOR

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Soluble Anions (1:5) in Soil by Ion Chromatography (continued)

Method: ME-(AU)-[ENV]AN245

Sample Number	Parameter	Units	LOR	Result
LB117119.001	Chloride	mg/kg	0.25	<0.25

Total Recoverable Metals in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result
LB117335.001	Arsenic, As	mg/kg	3	<3
	Cadmium, Cd	mg/kg	0.3	<0.3
	Chromium, Cr	mg/kg	0.3	<0.3
	Copper, Cu	mg/kg	0.5	<0.5
	Lead, Pb	mg/kg	1	<1
	Nickel, Ni	mg/kg	0.5	<0.5
	Zinc, Zn	mg/kg	0.5	<0.5
LB117336.001	Arsenic, As	mg/kg	3	<3
	Cadmium, Cd	mg/kg	0.3	<0.3
	Chromium, Cr	mg/kg	0.3	<0.3
	Copper, Cu	mg/kg	0.5	<0.5
	Lead, Pb	mg/kg	1	<1
	Nickel, Ni	mg/kg	0.5	<0.5
	Zinc, Zn	mg/kg	0.5	<0.5
LB117337.001	Arsenic, As	mg/kg	3	<3
	Cadmium, Cd	mg/kg	0.3	<0.3
	Chromium, Cr	mg/kg	0.3	<0.3
	Copper, Cu	mg/kg	0.5	<0.5
	Lead, Pb	mg/kg	1	<1
	Nickel, Ni	mg/kg	0.5	<0.5
	Zinc, Zn	mg/kg	0.5	<0.5
	Calcium, Ca	mg/kg	5	<5
	Magnesium, Mg	mg/kg	5	<5
	Sodium, Na	mg/kg	5	<5
	Potassium, K	mg/kg	10	<10

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB117067.001	TRH C10-C14	mg/kg	20	<20
	TRH C15-C28	mg/kg	45	<45
	TRH C29-C36	mg/kg	45	<45
	TRH C37-C40	mg/kg	100	<100
	TRH C10-C36 Total	mg/kg	110	<110

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB117101.001	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1
	Hydrocarbons	Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene	mg/kg	0.1	<0.1
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	96
		d4-1,2-dichloroethane (Surrogate)	%	-	109
		d8-toluene (Surrogate)	%	-	75
		Bromofluorobenzene (Surrogate)	%	-	70
	Totals	Total BTEX	mg/kg	0.6	<0.6

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB117101.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	96
		d4-1,2-dichloroethane (Surrogate)	%	-	109
		d8-toluene (Surrogate)	%	-	75

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE160957.031	LB117281.014	Mercury	mg/kg	0.05	<0.05	<0.05	200	0
SE160960.007	LB117281.024	Mercury	mg/kg	0.05	<0.05	<0.05	200	0

Moisture Content

Method: ME-(AU)-[ENV]AN002

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE160956.011	LB117208.011	% Moisture	%w/w	0.5	<0.5	<0.5	200	0
SE160957.010	LB117208.022	% Moisture	%w/w	0.5	2.0	1.8	82	13
SE160957.020	LB117208.033	% Moisture	%w/w	0.5	6.2	6.6	46	7
SE160957.030	LB117208.044	% Moisture	%w/w	0.5	5.7	5.8	47	3
SE160957.040	LB117208.055	% Moisture	%w/w	0.5	2.2	1.8	80	22
SE160957.042	LB117208.058	% Moisture	%w/w	0.5	10	10	40	1

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE160957.036	LB117067.034		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Lindane	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
			Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
			Endrin	mg/kg	0.2	<0.2	<0.2	200	0
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	0
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
			Mirex	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.16	0.16	30	1

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE160957.027	LB117067.014	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
		Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
		Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
		Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
		Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
		Fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
		Pyrene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
		Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
		Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE160957.027	LB117067.014		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	<0.2	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	175	0
			Total PAH (18)	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	30	9
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.6	30	10
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	30	10
SE160957.033	LB117067.032		Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
			Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
			Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	<0.2	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	175	0
			Total PAH (18)	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.4	30	7
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	5
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.4	30	11

Total Recoverable Metals in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE160957.005	LB117335.014	Arsenic, As	mg/kg	3	<3	<3	94	11
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.3	18	18	33	2
		Copper, Cu	mg/kg	0.5	6.8	6.4	38	5
		Lead, Pb	mg/kg	1	6	5	48	4
		Nickel, Ni	mg/kg	0.5	7.6	7.2	37	5
		Zinc, Zn	mg/kg	0.5	13	13	45	0
SE160957.014	LB117335.024	Arsenic, As	mg/kg	3	<3	<3	86	28
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	138	0
		Chromium, Cr	mg/kg	0.3	58	57	31	1
		Copper, Cu	mg/kg	0.5	18	19	33	3
		Lead, Pb	mg/kg	1	9	9	41	2
		Nickel, Ni	mg/kg	0.5	41	41	31	0
		Zinc, Zn	mg/kg	0.5	45	44	35	1
SE160957.024	LB117336.014	Arsenic, As	mg/kg	3	<3	<3	81	7
		Cadmium, Cd	mg/kg	0.3	0.4	0.4	113	1
		Chromium, Cr	mg/kg	0.3	63	65	31	2
		Copper, Cu	mg/kg	0.5	20	21	32	7
		Lead, Pb	mg/kg	1	9	9	41	4
		Nickel, Ni	mg/kg	0.5	50	57	31	13
		Zinc, Zn	mg/kg	0.5	40	41	35	2
SE160957.033	LB117336.024	Arsenic, As	mg/kg	3	<3	<3	70	6
		Cadmium, Cd	mg/kg	0.3	0.3	0.3	121	11
		Chromium, Cr	mg/kg	0.3	59	59	31	1

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Total Recoverable Metals in Soil/Waste Solids/Materials by ICPOES (continued)

Method: ME-(AU)-[ENV]AN040/AN320

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE160957.033	LB117336.024		Copper, Cu	mg/kg	0.5	22	23	32	3
			Lead, Pb	mg/kg	1	10	10	40	1
			Nickel, Ni	mg/kg	0.5	48	49	31	1
			Zinc, Zn	mg/kg	0.5	44	45	35	4
SE160960.006	LB117337.014		Arsenic, As	mg/kg	3	4	<3	61	23
			Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	143	0
			Chromium, Cr	mg/kg	0.3	43	36	31	18
			Copper, Cu	mg/kg	0.5	15	15	33	1
			Lead, Pb	mg/kg	1	13	13	38	4
			Nickel, Ni	mg/kg	0.5	33	29	32	13
			Zinc, Zn	mg/kg	0.5	14	15	44	3
SE160960.015	LB117337.024		Arsenic, As	mg/kg	3	<3	<3	70	13
			Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	178	0
			Chromium, Cr	mg/kg	0.3	16	15	33	11
			Copper, Cu	mg/kg	0.5	12	13	34	5
			Lead, Pb	mg/kg	1	19	16	36	17
			Nickel, Ni	mg/kg	0.5	19	19	33	4
			Zinc, Zn	mg/kg	0.5	32	32	36	2

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE160957.027	LB117067.014		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH C10-C40 Total	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0
SE160957.033	LB117067.031		TRH C10-C14	mg/kg	20	<20	<20	200	0
			TRH C15-C28	mg/kg	45	<45	<45	200	0
			TRH C29-C36	mg/kg	45	<45	<45	200	0
			TRH C37-C40	mg/kg	100	<100	<100	200	0
			TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH C10-C40 Total	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE160960.003	LB117101.014	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.9	4.9	50	0
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.5	5.6	50	2
			d8-toluene (Surrogate)	mg/kg	-	3.8	3.9	50	2
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.6	3.6	50	0
		Totals	Total Xylenes*	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0
SE160960.013	LB117101.025	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOC's in Soil (continued)

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE160960.013	LB117101.025	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.3	4.6	50	7
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.9	5.3	50	9
			d8-toluene (Surrogate)	mg/kg	-	4.0	3.6	50	9
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.8	3.7	50	3
		Totals	Total Xylenes*	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE160960.003	LB117101.014		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.9	4.9	30	0
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.5	5.6	30	2
			d8-toluene (Surrogate)	mg/kg	-	3.8	3.9	30	2
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.6	3.6	30	0
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0
SE160960.013	LB117101.025		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.3	4.6	30	7
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.9	5.3	30	9
			d8-toluene (Surrogate)	mg/kg	-	4.0	3.6	30	9
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.8	3.7	30	3
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR)

Method: ME-(AU)-[ENV]AN122

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB117341.002	Exchangeable Sodium, Na	mg/kg	2	NA	390	80 - 120	118

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB117281.002	Mercury	mg/kg	0.05	0.22	0.2	70 - 130	110

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB117067.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	102
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	98
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	108
		Dieldrin	mg/kg	0.2	<0.2	0.2	60 - 140	92
		Endrin	mg/kg	0.2	0.2	0.2	60 - 140	112
		p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	124
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.15	0.15	40 - 130	97

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB117067.002		Naphthalene	mg/kg	0.1	4.4	4	60 - 140	109
		Acenaphthylene	mg/kg	0.1	4.3	4	60 - 140	108
		Acenaphthene	mg/kg	0.1	4.2	4	60 - 140	104
		Phenanthrene	mg/kg	0.1	4.1	4	60 - 140	103
		Anthracene	mg/kg	0.1	3.9	4	60 - 140	96
		Fluoranthene	mg/kg	0.1	4.2	4	60 - 140	106
		Pyrene	mg/kg	0.1	3.5	4	60 - 140	88
		Benzo(a)pyrene	mg/kg	0.1	5.0	4	60 - 140	125
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	96
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	100
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	96

Soluble Anions (1:5) in Soil by Ion Chromatography

Method: ME-(AU)-[ENV]AN245

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB117119.002	Chloride	mg/kg	0.25	97	100	70 - 130	97

Total Recoverable Metals in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB117335.002	Arsenic, As	mg/kg	3	49	50	80 - 120	98
	Cadmium, Cd	mg/kg	0.3	51	50	80 - 120	102
	Chromium, Cr	mg/kg	0.3	48	50	80 - 120	95
	Copper, Cu	mg/kg	0.5	47	50	80 - 120	93
	Lead, Pb	mg/kg	1	48	50	80 - 120	96
	Nickel, Ni	mg/kg	0.5	50	50	80 - 120	101
	Zinc, Zn	mg/kg	0.5	48	50	80 - 120	96
LB117336.002	Arsenic, As	mg/kg	3	49	50	80 - 120	97
	Cadmium, Cd	mg/kg	0.3	51	50	80 - 120	101
	Chromium, Cr	mg/kg	0.3	47	50	80 - 120	94
	Copper, Cu	mg/kg	0.5	46	50	80 - 120	93
	Lead, Pb	mg/kg	1	48	50	80 - 120	96
	Nickel, Ni	mg/kg	0.5	50	50	80 - 120	99
	Zinc, Zn	mg/kg	0.5	47	50	80 - 120	95
LB117337.002	Arsenic, As	mg/kg	3	48	50	80 - 120	96
	Cadmium, Cd	mg/kg	0.3	48	50	80 - 120	97
	Chromium, Cr	mg/kg	0.3	47	50	80 - 120	95
	Copper, Cu	mg/kg	0.5	47	50	80 - 120	95
	Lead, Pb	mg/kg	1	48	50	80 - 120	96
	Nickel, Ni	mg/kg	0.5	48	50	80 - 120	97
	Zinc, Zn	mg/kg	0.5	48	50	80 - 120	96

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Total Recoverable Metals in Soil/Waste Solids/Materials by ICPOES (continued)

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB117337.002		Calcium, Ca	mg/kg	5	49	50	80 - 120	98
		Magnesium, Mg	mg/kg	5	48	50	80 - 120	95
		Sodium, Na	mg/kg	5	48	50	80 - 120	97
		Potassium, K	mg/kg	10	480	500	80 - 120	95

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB117067.002		TRH C10-C14	mg/kg	20	31	40	60 - 140	78
		TRH C15-C28	mg/kg	45	<45	40	60 - 140	85
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	90
	TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	32	40	60 - 140	80
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	98
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	80

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB117101.002	Monocyclic	Benzene	mg/kg	0.1	2.1	2.9	60 - 140	72
	Aromatic	Toluene	mg/kg	0.1	1.8	2.9	60 - 140	62
		Ethylbenzene	mg/kg	0.1	1.9	2.9	60 - 140	67
		m/p-xylene	mg/kg	0.2	4.7	5.8	60 - 140	82
		o-xylene	mg/kg	0.1	2.1	2.9	60 - 140	72
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.6	5	60 - 140	92
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.2	5	60 - 140	104
		d8-toluene (Surrogate)	mg/kg	-	3.8	5	60 - 140	75
		Bromofluorobenzene (Surrogate)	mg/kg	-	5.2	5	60 - 140	103

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB117101.002		TRH C6-C10	mg/kg	25	<25	24.65	60 - 140	88
		TRH C6-C9	mg/kg	20	<20	23.2	60 - 140	79
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.6	5	60 - 140	92
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.2	5	60 - 140	104
		d8-toluene (Surrogate)	mg/kg	-	3.8	5	60 - 140	75
		Bromofluorobenzene (Surrogate)	mg/kg	-	5.2	5	60 - 140	103
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	7.25	60 - 140	123

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE160956.005	LB117281.004	Mercury	mg/kg	0.05	0.21	<0.05	0.2	98

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE160957.028	LB117067.033		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Lindane	mg/kg	0.1	<0.1	<0.1	-	-
			Heptachlor	mg/kg	0.1	0.2	<0.1	0.2	81
			Aldrin	mg/kg	0.1	0.2	<0.1	0.2	75
			Beta BHC	mg/kg	0.1	<0.1	<0.1	-	-
			Delta BHC	mg/kg	0.1	0.2	<0.1	0.2	83
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	-	-
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	-	-
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	-	-
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	-	-
			Dieldrin	mg/kg	0.2	<0.2	<0.2	0.2	76
			Endrin	mg/kg	0.2	<0.2	<0.2	0.2	100
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	-	-
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	-	-
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	-	-
			p,p'-DDT	mg/kg	0.1	0.2	<0.1	0.2	124
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	-	-
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	-	-
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	-	-
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	-	-
			Isodrin	mg/kg	0.1	<0.1	<0.1	-	-
			Mirex	mg/kg	0.1	<0.1	<0.1	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.16	0.17	-	106

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE160956.001	LB117067.031		Naphthalene	mg/kg	0.1	3.9	<0.1	4	98
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
			Acenaphthylene	mg/kg	0.1	3.9	<0.1	4	98
			Acenaphthene	mg/kg	0.1	4.2	<0.1	4	104
			Fluorene	mg/kg	0.1	<0.1	<0.1	-	-
			Phenanthrene	mg/kg	0.1	3.9	<0.1	4	97
			Anthracene	mg/kg	0.1	3.6	<0.1	4	90
			Fluoranthene	mg/kg	0.1	4.0	<0.1	4	100
			Pyrene	mg/kg	0.1	3.7	<0.1	4	92
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
			Chrysene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(a)pyrene	mg/kg	0.1	4.8	<0.1	4	121
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	-	-
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ	0.2	4.8	<0.2	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	5.0	<0.3	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	4.9	<0.2	-	-
			Total PAH (18)	mg/kg	0.8	32	<0.8	-	-
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.5	0.4	-	90
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.4	-	90

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE160956.001	LB117067.031	Surrogates	d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.4	-	94

Total Recoverable Metals in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE160956.005	LB117335.004		Arsenic, As	mg/kg	3	42	<3	50	78
			Cadmium, Cd	mg/kg	0.3	42	<0.3	50	85
			Chromium, Cr	mg/kg	0.3	45	6.6	50	77
			Copper, Cu	mg/kg	0.5	57	19	50	76
			Lead, Pb	mg/kg	1	54	20	50	69 ⑨
			Nickel, Ni	mg/kg	0.5	43	4.9	50	77
			Zinc, Zn	mg/kg	0.5	51	15	50	72
SE160957.015	LB117336.004		Arsenic, As	mg/kg	3	30	<3	50	55 ⑨
			Cadmium, Cd	mg/kg	0.3	39	<0.3	50	77
			Chromium, Cr	mg/kg	0.3	84	50	50	67 ⑨
			Copper, Cu	mg/kg	0.5	55	17	50	76
			Lead, Pb	mg/kg	1	44	9	50	69 ⑨
			Nickel, Ni	mg/kg	0.5	70	34	50	73
			Zinc, Zn	mg/kg	0.5	69	31	50	76
SE160957.039	LB117337.004		Arsenic, As	mg/kg	3	44	<3	50	84
			Cadmium, Cd	mg/kg	0.3	44	<0.3	50	88
			Chromium, Cr	mg/kg	0.3	63	21	50	84
			Copper, Cu	mg/kg	0.5	52	6.0	50	92
			Lead, Pb	mg/kg	1	49	5	50	87
			Nickel, Ni	mg/kg	0.5	53	8.3	50	89
			Zinc, Zn	mg/kg	0.5	64	17	50	95

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE160956.001	LB117067.032		TRH C10-C14	mg/kg	20	39	<20	40	98
			TRH C15-C28	mg/kg	45	<45	<45	40	110
			TRH C29-C36	mg/kg	45	<45	<45	40	98
			TRH C37-C40	mg/kg	100	<100	<100	-	-
			TRH C10-C36 Total	mg/kg	110	120	<110	-	-
			TRH C10-C40 Total	mg/kg	210	<210	<210	-	-
		TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	40	<25	40	100
			TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	40	<25	-	-
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	40	113
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	-	-

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE160957.027	LB117101.004	Monocyclic Aromatic	Benzene	mg/kg	0.1	2.1	<0.1	2.9	72
			Toluene	mg/kg	0.1	1.9	<0.1	2.9	66
			Ethylbenzene	mg/kg	0.1	1.9	<0.1	2.9	64
			m/p-xylene	mg/kg	0.2	4.7	<0.2	5.8	80
			o-xylene	mg/kg	0.1	2.1	<0.1	2.9	71
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.3	4.8	-	86
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.0	5.5	-	100
			d8-toluene (Surrogate)	mg/kg	-	3.7	4.0	-	73
			Bromofluorobenzene (Surrogate)	mg/kg	-	5.0	3.6	-	101
		Totals	Total Xylenes*	mg/kg	0.3	6.8	<0.3	-	-
			Total BTEX	mg/kg	0.6	13	<0.6	-	-

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE160957.027	LB117101.004		TRH C6-C10	mg/kg	25	<25	<25	24.65	85
			TRH C6-C9	mg/kg	20	<20	<20	23.2	79
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.3	4.8	-	86
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.0	5.5	-	100
			d8-toluene (Surrogate)	mg/kg	-	3.7	4.0	-	73
			Bromofluorobenzene (Surrogate)	mg/kg	-	5.0	3.6	-	101
		VPH F	Benzene (F0)	mg/kg	0.1	2.1	<0.1	-	-

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Volatile Petroleum Hydrocarbons in Soil (continued) — **Method: ME-(AU)-[ENV]AN433**

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE160957.027	LB117101.004	VPH F	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	7.25	117

MATRIX SPIKE DUPLICATES

SE160957 R0

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here: http://www.sgs.com.au/~/media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022 QA QC Plan.pdf

*	NATA accreditation does not cover tthe performance of this service.
-	Sample not analysed for this analyte.

IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.

①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to Analytical Report comments for further information.

Chain of Custody Form – Ref 7891

Ref:	**7891**
Investigator:	Envirowest Consulting 9 Cameron Place PO Box 8158 ORANGE NSW 2800
Telephone:	(02) 6361 4954
Facsimile:	(02) 6360 3960
Email:	ashleigh@envirowest.net.au
Contact Person:	Ashleigh Pickering
Invoice:	accounts@envirowest.net.au
Laboratory:	SGS SYDNEY 16/33 Maddox Street ALEXANDRIA NSW 2015
Quotation #:	
Courier/CN:	

Sample ID	Container*	Sampling Date/Time	Sample matrix: Water	Soil	Sludge	Sample preservation: Cool	HNO3/HCl	Unpreserved	Analysis: SGS Method Code CL1: 7 Metals	OC Pesticides	CL10: TRH/BTEXN/PAH/8 metals		
SR1	A	11/01/2017		X		X		X	X				
SR2	A	11/01/2017		X		X		X	X				
SR3	A	11/01/2017		X		X		X	X				
SR4	A	11/01/2017		X		X		X	X				
SR5	A	11/01/2017		X		X		X	X				
SR6	A	11/01/2017		X		X		X	X				
SR7	A	11/01/2017		X		X		X	X				
SR8	A	11/01/2017		X		X		X	X				
SR9	A	11/01/2017		X		X		X	X				
SR10	A	11/01/2017		X		X		X	X				
SR11	A	11/01/2017		X		X		X	X				
SR12	A	11/01/2017		X		X		X	X				
SR13	A	11/01/2017		X		X		X	X				
SR14	A	11/01/2017		X		X		X	X				
SR15	A	11/01/2017		X		X		X	X				

SGS EHS Alexandria Laboratory

SE160957 COC

Received: 17 – Jan – 2017

Investigator: I attest that the proper field sampling procedures were used during the collection of these samples.

Sampler name: Ashleigh Pickering
Date : 11 & 12/01/2017 Time:

Relinquished by: (print and signature)	Ashleigh Pickering	Date	Time	Received by: (print and signature)	Date	Time
		16/01/2017	17:00		17/01/17	@ 11.40

Please return completed form to Envirowest Consulting, *A = Solvent rinsed glass jar with Teflon lined lid and orange label

Chain of Custody Form – Ref 7891

Ref:	**7891**	**Sample matrix**			**Sample preservation**			**Analysis**						
Investigator:	Envirowest Consulting 9 Cameron Place PO Box 8158 ORANGE NSW 2800							**SGS Method Code**						
Telephone:	(02) 6361 4954							**CL1**		**CL10**				
Facsimile:	(02) 6360 3960													
Email:	ashleigh@envirowest.net.au													
Contact Person:	Ashleigh Pickering													
Invoice:	accounts@envirowest.net.au													
Laboratory:	SGS SYDNEY 16/33 Maddox Street ALEXANDRIA NSW 2015	Water	Soil	Sludge	Cool	HNO3/HCl	Unpre-served	7 Metals	OC Pesticides	TRH/BTEXN/PAH/ 8 metals				
Quotation #:														
Courier/CN:														
Sample ID	**Container***	**Sampling Date/Time**												
SR16	A	11/01/2017		X		X		X	X					
SR17	A	11/01/2017		X		X		X	X					
SR18	A	11/01/2017		X		X		X	X					
SR19	A	11/01/2017		X		X		X	X					
SR20	A	11/01/2017		X		X		X	X					
SR21	A	11/01/2017		X		X		X	X					
SR22	A	11/01/2017		X		X		X	X					
SR23	A	11/01/2017		X		X		X	X					
SR24	A	11/01/2017		X		X		X	X					
SR25	A	11/01/2017		X		X		X	X					
SR26	A	11/01/2017		X		X		X	X					
SR27	A	11/01/2017		X		X		X		X	X			
SR28	A	11/01/2017		X		X		X		X	X			
SR29	A	11/01/2017		X		X		X		X	X			
SR30	A	11/01/2017		X		X		X		X	X			
Investigator: I attest that the proper field sampling procedures were used during the collection of these samples.					Sampler name: Ashleigh Pickering Date : 11 & 12/01/2017 Time:									
Relinquished by: (print and signature)	Ashleigh Pickering	Date 16/01/2017	Time 17:00		Received by: (print and signature)			Date 17/1/17	Time 11:40					

Please return completed form to Envirowest Consulting, *A = Solvent rinsed glass jar with Teflon lined lid and orange label

Chain of Custody Form – Ref 7891

Ref:	**7891**		**Sample matrix**			**Sample preservation**			**Analysis**						
Investigator:	Envirowest Consulting 9 Cameron Place PO Box 8158 ORANGE NSW 2800								**SGS Method Code**						
Telephone:	(02) 6361 4954								**CL1**		**CL10**				
Facsimile:	(02) 6360 3960														
Email:	ashleigh@envirowest.net.au														
Contact Person:	Ashleigh Pickering														
Invoice:	accounts@envirowest.net.au														
Laboratory:	SGS SYDNEY 16/33 Maddox Street ALEXANDRIA NSW 2015		Water	Soil	Sludge	Cool	HNO3/HCl	Unpre-served	7 Metals	OC Pesticides	TRH/BTEXN/PAH/ 8 metals	Chlorides	Cations	Exchangeable sodium percentage
Quotation #:															
Courier/CN:															
Sample ID	**Container***	**Sampling Date/Time**													
SR31	A	11/01/2017		X		X		X		X	X				
SR32	A	12/02/2017		X		X		X		X	X				
SR33	A	12/02/2017		X		X		X		X	X				
SR73	A	11/01/2017		X		X		X		X					
SR91	A	11/01/2017		X		X		X		X					
SR113	A	11/01/2017		X		X		X		X					
SR184	A	11/01/2017		X		X		X		X					
SR224	A	11/01/2017		X		X		X		X					
SRA	A	11/01/2017		X		X		X	X						
SRB	A	11/01/2017		X		X		X	X						
BH16-100	A	11/01/2017		X		X		X				X	X	X	
BH16-1500	A	11/01/2017		X		X		X				X	X	X	
Investigator: I attest that the proper field sampling procedures were used during the collection of these samples.						Sampler name: Ashleigh Pickering Date : 11 & 12/01/2017			Time:						
Relinquished by: (print and signature)	Ashleigh Pickering	Date 16/01/2017	Time 17:00			Received by: (print and signature)			Date 17/1/17	Time 10:40					

Please return completed form to Envirowest Consulting, *A = Solvent rinsed glass jar with Teflon lined lid and orange label

HillPDA CONSULTING

A Level 3, 234 George St
Sydney NSW 2000
T 02 9252 8777
W hillpda.com
ABN: 52 003 963 755

Steven Jennings
Strategic Planning Services Supervisor
Dubbo Regional Council
PO Box 81
Dubbo NSW 2830

21 April 2017

Dear Steven,

Subject: South East Dubbo Retail Centre

HillPDA was asked by Dubbo Regional Council to address and provide advice on a number of key issues relating to the strategic context and impact of the proposed South East Shopping Centre as detailed below.

1. **Dubbo Commercial Hierarchy: Composition of the hierarchy and where the proposed centre would fit**

Retail centres within Dubbo Local Government Area (LGA) have been developed in accordance with the Retail Hierarchy as set by the Dubbo Commercial Areas Development Strategy. The following table as provided below includes a snapshot of this hierarchy and the associated retail centres:

Table 1: Dubbo Retail Hierarchy

Centre Hierarchy	Dubbo LEP 2011 Land Use Zones	Characteristics	Centres
Major Centre (First Level)	B3 Commercial Core	Major shopping and business centre serving the regional population. The centre provides a wide range of business, employment, entertainment and community uses and is the main retail, commercial and business area within Dubbo and the surrounding region.	Dubbo CBD
Local Centre (Second Level)	B2 Local Centre	This covers centres that provide a range of business and retail needs. Sub-regional centres provide a second level retail focus for the City and the region, whilst the Central Business District provides the first level commercial area within the City and the region. Sub-regional centres offer a strong retail offer and typically include one or two full-line supermarkets. Centres serve a wider catchment, serving 4,500-9,500 dwellings pending on the scale of the centre.	Orana Mall

Centre Hierarchy	Dubbo LEP 2011 Land Use Zones	Characteristics	Centres
Neighbourhood Centre (Third Level)	B1 Neighbourhood Centre	These are small scale centres and include retail uses, business premises, or community uses that serve the needs of the nearby residential and/ or business community. Centres provide for convenience shopping. The neighbourhood centre typology also includes Delroy Central which comprises a 2,500sqm supermarket. It is acknowledged that the Delroy Shopping Centre has the ability to perform as a Second Level or Sub-regional centre for residents in West Dubbo.	Tamworth Street Boundary Road Bourke St Delroy Central Myall St Webdale Rd (p)* South East SC (p)*

Source: Draft Dubbo LEP 2010; HillPDA
*(p) proposals

The proposed centre at South East Dubbo has a trade area of approximately 10,000 residents (~3,900 dwellings) by 2031, suggesting that it could support a Neighbourhood Centre similar to that provided at Delroy Central. The proposed centre will also perform as a Second Level centre for residents in South East Dubbo.

2. Extension of the Dubbo CBD to the west: What is this comprised of, previous council deliberations and the impact of the proposal if any on this position.

HillPDA previously developed three scenarios for the future expansion of the Dubbo CBD[1]. In undertaking analysis of the need for commercial land in the City, HillPDA concluded that Council could consider future expansion of the CBD. Option 1 included land bound by Darling Street, Erskine Street and Macquarie Street to be zoned B3 Commercial Core, whilst options 2 and 3 involved further extension into west Dubbo (see figures below).

[1] Dubbo Retail & Commercial Demand Review Addendum, HillPDA, 2011

Figure 1: Extent of Scenario 1 Lands

Source: City of Dubbo Council

Figure 2: Extent of Scenario 2 Lands

Source: City of Dubbo Council

Figure 3: Extent of Scenario 3 Lands

Source: City of Dubbo Council

At the time, Council was advised that Scenario 1 offered the best option for providing for a natural expansion of the CBD in the short term since:

- it is well connected to the CBD by foot; and
- provided a large area within which new retail uses may be developed within the short-term;
- The potential developable parcels of land in this area would be of a sufficient size to accommodate large format retail units which are required in the CBD.

Option 1 was also considered to be the most appropriate having regard to the fact that adoption of options 2 or 3 would require the construction of a bridge across the Macquarie River to connect the CBD with West Dubbo.

Council resolved to adopt the Dubbo Retail Demand Review 2010 as planning reference document only, along with the existing Commercial Areas Development Strategy and the draft Commercial Areas Development Strategy 2009 prepared by Andrews Neil.

The areas identified in the three scenarios were subsequently zoned as follows under the Dubbo LEP 2011:

- **Scenario 1:** Combination of B3 and B6;
- **Scenario 2:** Combination of R1, B6, SP3 and small portion of B1;

- **Scenario 3:** SP3

A number of influences have developed since then, including:

- The opening of Delroy Central, a relatively new Woolworths supermarket anchored shopping centre with around 3,800 sq.m (retail GLA) in Delroy Park; and
- The opening of an ALDI foodstore on Talbragar Street.

At the present time, it is considered that any further extension of the Dubbo CBD to the west is not currently required. It is considered that the current land availability in the Dubbo CBD, which is zoned B3 Commercial Core meets the immediate requirements for commercial development activities. However, it is noted that the Dubbo CBD will likely require an expansion to the west, consistent with the provisions of the Dubbo Urban Areas Development Strategy. The Strategy, which includes future expansion to West Dubbo is considered sound and will allow appropriate future opportunities for commercial development. Should additional floorspace be provided to the west in the longer term, the proposal will have a minimal impact as they will effectively serve different catchments and growing population.

3. **Strategic Recommendations: Does Council still require B1 Neighbourhood Centre zoning at Myall Street and Websdale Drive**

Properties 272 Myall Street and 37-39 Websdale Drive, Dubbo are currently zoned B1 Neighbourhood Centre under the provisions of the Dubbo LEP 2011, referred to as the Myall Street and Websdale Drive Sites hereafter.

The Myall Street Site includes a commercial development of some 1,200sqm comprising a small convenience/grocery store (of less than 400sqm) and a further four retail tenants (e.g. butcher, hair salon, dry cleaners and newsagent).

The Websdale Drive Site totals 4,270 sqm of land and is currently vacant. It is understood that the land also has approval for a 1,000sqm supermarket but work has not commenced.

As a longer term strategy and in planning for preparation of Council's Employment lands Strategy, HillPDA recommends maintaining the B1 Neighbourhood Centre zone for only one of these centres to service the local community to the north of Myall Street. Two B1 zones in such close proximity (1.2km) with the potential to provide a similar

offer would lead to an overly competitive and saturated market in that location.

The existing Myall Street centre is strategically positioned at the entry point to the northern residential estates, however it is also located next to the public housing area where spending levels are lower than average and the shops appear to be performing mundanely. However the shops do face the street which is preferable to a number of other neighbourhood centres in public housing estates constructed in the 1970s that face away from the street.

The Websdale Drive site benefits from a reasonable size catchment within 1km distance with some 3,000 residents with higher spending levels. On this basis Websdale Drive offers an opportunity to provide a more attractive offer to service the local community to the north of Myall Street.

As a component of the development process for the new Employment Lands Strategy it is suggested that Council liaise with the land owner to seek what their intentions are for the site.

4. **Impact of the proposal on Myall Street and Websdale Drive**

It is considered that the Myall Street Neighbourhood Centre and any development on the Websdale Drive Site will not significantly compete with proposed South East Centre as these centres are likely to serve their immediate localised catchment. As such the Proposal is unlikely to have a significant impact on these centres.

5. **Is the proposal too early; is the 3,500sqm now appropriate for supermarkets. Should the 1,000sqm metres of specialties remain and the 1,000sqm of personal and other services not be included?**

Based on the MD demand analysis and the forecast population growth in the area there is justification for a full-line supermarket at the proposed Site to service the future population.

As addressed in HillPDA's peer review, 2025-26 is considered to be a more appropriate year of commencement due to population levels rather than 2019-20 as suggested in the MD EIA.

These days 2,800sqm to 3,000sqm is considered to be a minimum size for a full-line supermarket operated by Coles or Woolworths – although these operators would probably prefer 3,500sqm. Supa-IGAs are usually smaller down to 1,500sqm but these supermarkets generally don't perform as well.

The MD EIA is correct in its assertion that single supermarket anchored shopping centres typically provide some 1,300 – 1,500 sqm of specialty retail floorspace[2]. Complementary specialty and other uses can improve the overall attractiveness of the centre and support the supermarket if designed well. If, or when, Council supports the supermarket then we recommend that the proposed centre be allowed to provide up to 1,000sqm of complementary specialty retail floorspace (around 11-12 specialty shops including a butcher, liquor, bakery, one or two take-away foods, one or two restaurants, hair and beauty salon and possibly a chemist and newsagent). A further (approximately 500sqm) of other (non-retail) uses (such as medical, real estate services, etc) would also be acceptable.

Yours sincerely

ADRIAN HACK
M. Land Econ. B.Town Planning (Hons). MPIA
Principal Urban and Retail Economics
Adrian.Hack@hillpda.com.

[2] HillPDA conducted a high level review of neighborhood centres comprising of a single full line supermarket from the Property Council of Australia Shopping Centre Directory.