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Our Ref: 217501_LET_009

6 February 2025

Lithgow City Council
PO Box 19,
180 Mort Street
Lithgow NSW 2790

Attention: Jemma Houlison, Waste Compliance Officer

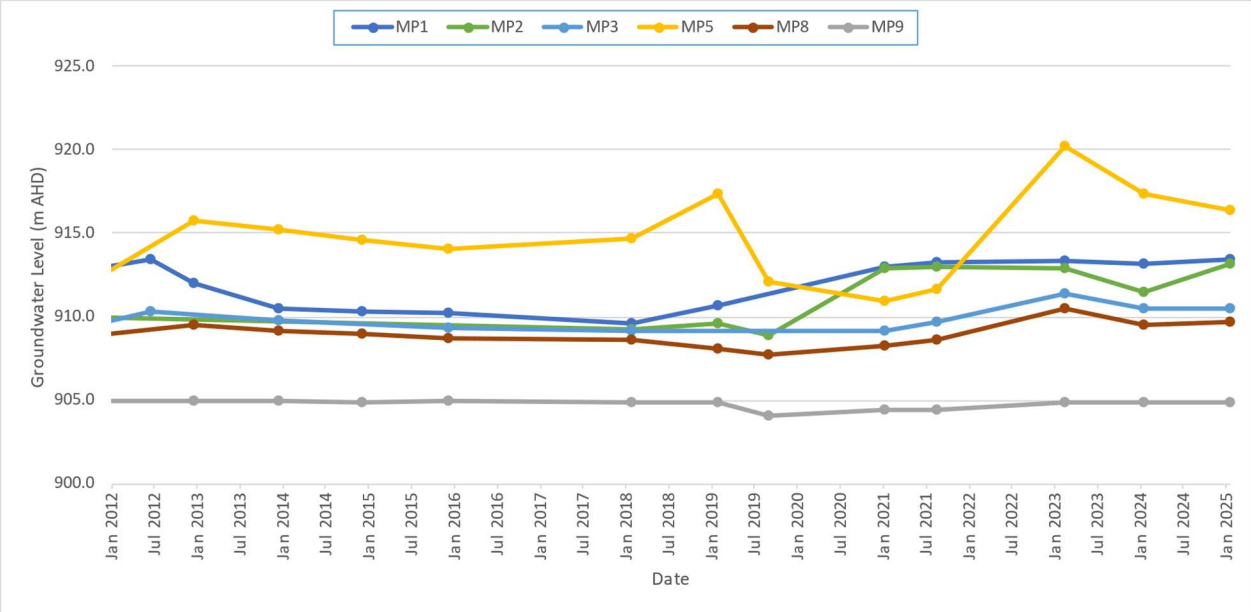
Environmental Monitoring of Portland Waste Disposal Depot, Under Environment Protection Licence 10936

Premise has completed annual groundwater monitoring at Portland Waste Disposal Depot, located off the Portland Cullen Bullen Road, approximately 2 km north of Portland, NSW.

Groundwater Levels

Groundwater was gauged at six (6) groundwater monitoring wells across the site. Groundwater gauging data is included in Table 1 (attached), and elevation trends are shown on **Figure 1**.

Figure 1 – Portland Waste Disposal Depot – Groundwater Elevations



Observations were as follows:

- Depths to groundwater ranged from artesian (overflowing) conditions observed at MP9, to 21.65 metres below ground level (mbgl) at MP5. Corrected groundwater elevations ranged from 904.90 metres Australian Height Datum (mAHD) at MP9, to 916.35 mAHD at MP5.
- Inference of groundwater elevations, calculated from available survey data from installed groundwater monitoring wells, indicates a flow direction to the north-west.

Groundwater Quality

All groundwater samples were able to be collected from their sampling points. Samples were couriered to SGS Laboratories in Alexandria, NSW, who are NATA accredited to perform the scheduled analysis. Results of analysis are included in **Table 2** (attached), and laboratory certificates have also been appended to this letter.

Groundwater quality has been assessed by comparison to criteria (where available) adopted from Australian and New Zealand Environment and Conservation Council (ANZECC) Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* 2000 – Primary Industries: Water quality for irrigation and general water use.

- Laboratory measured pH ranged from 4.4 at MP2 and MP3 to 6.9 at MP1, and was outside the guideline range considered suitable for pumping, irrigation, and stock watering (6.0 to 8.5 pH units) at MP2 and MP3.
- Electrical conductivity (EC) ranged from 660 µS/cm at MP2 to 3,400 µS/cm at MP9. Corresponding total dissolved solids (TDS) concentrations (respectively 442 mg/L to 2,278 mg/L) indicate that groundwater did not exceed the livestock watering 'loss of production' TDS tolerance limit for the most sensitive livestock category, poultry (3,000 mg/L, ANZECC & ARMCANZ, 2000).
- Total alkalinity in groundwater ranged from below the laboratory limit of reporting (LOR) of 5 mg$CaCO_3$/L at MP2 and MP3 to 680 mg$CaCO_3$/L at MP9. Groundwater alkalinity at MP1, MP5, MP8, and MP9 exceeded the guideline hardness value for potential fouling of waters (350 mg/L).
- Groundwater chloride concentrations ranged from 81 mg/L at MP1 to 470 mg/L at MP3. The chloride concentration recorded at MP3 exceeded the guideline value for protection of moderately sensitive crops (350 mg/L).
- Fluoride concentrations in groundwater ranged from below the laboratory LOR of 0.1 mg/L at MP1, MP8, and MP9 to 0.7 mg/L at MP3. All concentrations were below the guideline value of 1 mg/L for long-term irrigation use (up to 100 years).
- Sulfate concentrations in groundwater ranged from 160 mg/L at MP2 to 1,300 mg/L at MP9.
- Calcium concentrations ranged from 34 mg/L at MP2 to 410 mg/L at MP9.
- Magnesium concentrations ranged from 11 mg/L at MP2 to 260 mg/L at MP9.
- Potassium concentrations ranged from 6.4 mg/L at MP9 to 130 mg/L at MP1.

- Concentrations of sodium ranged from 69 mg/L at MP1 to 370 mg/L at MP3. Sodium concentrations in the groundwater sample collected from MP3 exceeded the guideline level for irrigation to moderately sensitive crops (<230 mg/L).
- Total organic carbon (TOC) in groundwater ranged from 1.6 mg/L at MP9 to 59 mg/L at MP1.
- Ammonia concentrations in groundwater ranged from 0.04 mgN/L at MP2, MP3 and MP8. to 3.2 mgN/L at MP1.
- Nitrate concentrations ranged from below the laboratory LOR of 0.005 mgN/L at MP1, MP5, MP8, and MP9 to 130 mgN/L at MP3.
- Iron concentrations ranged from below the laboratory LOR of 0.005 mg/L at MP5 and MP8, to 0.16 mg/L at MP2. Iron concentrations recorded in all collected groundwater samples remained below the long-term (up to 100 years) irrigation guideline concentration of 0.2 mg/L.
- Manganese concentrations ranged from 0.26 mg/L at MP5 to 4.0 mg/L at MP8. Manganese concentrations at all locations exceeded the long-term (up to 100 years) irrigation guideline concentration of 0.2 mg/L.
- Total phenols were below the laboratory LOR of 0.05 mg/L at all groundwater monitoring points.
- Organochlorine pesticides were below respective laboratory LORs at all groundwater monitoring points.

Surface Water

The surface water monitoring point SW1 was inspected in January 2025. No discharge was occurring at the time of inspection, and no evidence of discharge(s) having occurred prior was apparent.

The next routine monitoring for groundwater is scheduled for January 2026. Surface water monitoring is required to take place any calendar month when a surface water discharge is recorded at an interval of not less than once every 6 months.

Please do not hesitate to contact us with any questions or comments you may have regarding this report.

Yours sincerely

BRENDAN STUART
Senior Environmental Scientist

No. of Attachments – 4:

Environmental Monitoring Point Locations
Table 1 – Groundwater Level Measurements
Table 2 – Results of Laboratory Analyses (Groundwater) – January 2025
SGS Laboratories Analytical Reports – January 2025

NOTE: COORDINATES ARE IN MGA 56

Site	EPA Pt	Description	Alt_m (ground)	Easting	Northing
SW1	1	Surface water	912.70	218960.96	6307504.51
MP1	3	Groundwater	914.00	219008.27	6307520.99
MP2	4	Groundwater	913.40	218987.43	6307509.94
MP3	5	Groundwater	913.70	218973.74	6307499.41
MP5	6	Groundwater	937.20	219240.13	6307344.26
MP8	7	Groundwater	912.00	219016.68	6307560.50
MP9	8	Groundwater	904.00	218821.69	6307534.80

LEGEND

- LANDFILL BOUNDARY
- SW1 — SURFACE WATER MONITORING LOCATIONS
- MB1 — MONITORING BORE LOCATIONS

IMAGERY DATED - OCT 2023

MGA55

CEH SURVEY
CONSULTING LAND, ENGINEERING AND MINING SURVEYORS
"Astrolabe" 1 Rutherford Lane,
LITHGOW 2790
ABN: 68 056 544 551 Office: (02) 6351 2281
Email: survey@ceh.com.au Website: www.ceh.com.au

DATE	12-05-2022
AMENDED	06-06-2022
SURVEYOR	TH
DRAWN	TH
CHECKED	

CLIENT: LITHGOW CITY COUNCIL
CEH REF: 3/1939TH
SURVEY: MONITORING PLAN
PROPERTY: PORTLAND GARBAGE DEPOT
LOCALITY: PORTLAND/CULLEN BULLEN RD, PORTLAND

SCALE - 1:2000(A3) DATUM: A.H.D.

DRAWING No:

PGD-MONIT_PLAN

Premise

TABLE A1: PORTLAND WASTE DISPOSAL DEPOT - GROUNDWATER LEVEL RESULTS

Ground Water Levels: 15-Jan-25

Piezometer Details:

	Ground Elev (mAHD)	Stickup (m)	Elevation Top PVC (mAHD)	Date	Measured (m)	GWL (mAHD)	Well Depth (m)	Well Base (mAHD)	Water Column (m)
MP1	913.700	0.40	914.100	15/01/2025	0.64	913.46	6.0	908.09	5.37
MP2	913.600	0.20	913.800	15/01/2025	0.62	913.18	5.0	908.80	4.38
MP3	914.200	0.60	914.800	15/01/2025	4.34	910.46	5.8	909.00	1.46
MP5	937.200	0.80	938.000	15/01/2025	21.65	916.35	61.3	876.70	39.65
MP8	911.800	0.50	912.300	15/01/2025	2.65	909.65	21.5	890.79	18.86
MP9	903.800	1.10	904.900	15/01/2025	0.00	904.90	16.7	888.20	16.70

Definitions:

Stickup: Height of piezometer pipe above ground surface.

Ground Elev: Actual elevation of ground at the piezometer relative to an arbitrary datum. All ground elevations are measured to the same datum, hence Piezo GWLs are relative to each other.

GWL: Actual elevation of groundwater at the piezometer relative to an arbitrary datum.

NMWL: No Measured Water Level

Measured: Depth of groundwater measured from the top of the piezometer pipe.

	MP1		**MP2**		**MP3**		**MP5**		**MP8**		**MP9**	
Date	Measured	GWL (mAHD)	Measured	GWL (mAHD)	Measured	GWL (mAHD)	Measured	GWL (mAHD)	Measured	GWL (mAHD)	Measured	GWL (mAHD)
01-Jun-10	4.21	909.89	NMWL		NMWL		30.20	907.80	4.48	907.82	0.00	904.90
15-Dec-10	1.23	912.87	NMWL		NMWL		27.37	910.63	3.44	908.86	-0.05	904.95
29-Jun-11	1.30	912.80	NMWL		5.65	909.15	25.67	912.33	3.62	908.68	-0.05	904.95
27-Jul-11	1.57	912.53	NMWL		NMWL		NMWL		NMWL		NMWL	
06-Dec-11	1.14	912.96	3.85	909.95	NMWL		25.40	912.60	Bore Damaged		-0.05	904.95
13-Jun-12	0.70	913.40	NMWL		4.48	910.32	NMWL		NMWL		NMWL	
16-Dec-12	2.09	912.01	NMWL		NMWL		22.22	915.78	2.77	909.53	-0.05	904.95
11-Dec-13	3.57	910.53	NMWL		4.98	909.82	22.79	915.21	3.16	909.14	-0.05	904.95
04-Dec-14	3.80	910.30	NMWL		NMWL		23.43	914.57	3.33	908.97	0.05	904.85
03-Dec-15	3.84	910.26	NMWL		5.45	909.35	23.97	914.03	3.57	908.73	-0.05	904.95
24-Jan-18	4.46	909.64	4.56	909.24	5.68	909.12	23.30	914.70	3.68	908.62	0.05	904.85
30-Jan-19	3.40	910.70	4.18	909.62	NMWL		20.61	917.39	4.23	908.07	0.05	904.85
02-Sep-19	NMWL		4.92	908.88	NMWL		25.93	912.07	4.61	907.69	0.87	904.03
05-Jan-21	1.11	912.99	0.9	912.90	5.61	909.19	27.05	910.95	4.04	908.26	0.49	904.41
19-Aug-21	0.85	913.25	0.84	912.96	5.13	909.67	26.35	911.65	3.69	908.61	0.50	904.40
15-Feb-23	0.72	913.38	0.92	912.88	3.43	911.37	17.82	920.18	1.85	910.45	0.00	904.90
17-Jan-24	0.91	913.19	2.33	911.47	4.32	910.48	20.60	917.40	2.82	909.48	0.00	904.90
15-Jan-25	0.64	913.46	0.62	913.18	4.34	910.46	21.65	916.35	2.65	909.65	0.00	904.90

TABLE 2: PORTLAND WASTE DISPOSAL DEPOT - RESULTS OF LABORATORY ANALYSIS
JANUARY 2025 **GROUNDWATER**

				Sample ID	MP-1	MP-2	MP-3	MP-5	MP-8	MP-9
				Sample Date	15/01/2025 12:30 PM	15/01/2025 11:40 AM	15/01/2025 10:50 AM	15/01/2025 1:55 PM	15/01/2025 2:40 PM	15/01/2025 3:10 PM
Group	**Analyte**	**LOR**	**Units**	**Criteria**	PS	PS	PS	PS	PS	PS
Physical Parameters	pH (Lab)	0	No unit	6.0 - 8.5	**6.9**	**4.4**	**4.4**	**6.7**	**6.6**	**6.8**
	Electrical Conductivity (Lab)	2	µS/cm	4478	**1400**	**660**	**3100**	**2200**	**3000**	**3400**
Alkalinity	Total Alkalinity as CaCO3	5	mg/L	350	**370**	< 5	< 5	**550**	**570**	**680**
Anions	Chloride	1	mg/L	350	**81**	**89**	**470**	**120**	**290**	**320**
	Fluoride	0.1	mg/L	1	< 0.1	**0.33**	**0.7**	**0.24**	< 0.1	< 0.1
	Sulfate (SO4)	1	mg/L	-	**310**	**160**	**640**	**760**	**1100**	**1300**
Cations	Calcium (Ca)	0.2	mg/L	1000	**140**	**34**	**150**	**310**	**390**	**410**
	Magnesium (Mg)	0.1	mg/L	-	**41**	**11**	**120**	**140**	**170**	**260**
	Potassium (K)	0.1	mg/L	-	**130**	**27**	**7**	**14**	**9.3**	**6.4**
	Sodium (Na)	0.5	mg/L	230	**69**	**72**	**370**	**96**	**210**	**210**
Forms of Carbon	Total Organic Carbon	0.2	mg/L	-	**59**	**20**	**7.7**	**2.8**	**6.2**	**1.6**
Nutrients	Ammonia (NH3) as N	0.01	mg/L	-	**3.2**	**0.04**	**0.04**	**0.1**	**0.04**	**0.06**
	Nitrate (NO3) as N	0.005	mg/L	-	< 0.005	**8.9**	**130**	< 0.005	< 0.005	-
	Nitrate (NO3) as N	0.025	mg/L	-	-	-	-	-	-	< 0.025
Trace Metals	Iron (Fe)	0.005	mg/L	0.2	**0.076**	**0.16**	**0.091**	< 0.005	< 0.005	< 0.005
	Manganese (Mn)	0.001	mg/L	0.2	**0.31**	**0.37**	**3.9**	**0.26**	**4**	**0.95**
Phenolics	Total Phenols	0.05	mg/L	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
OC Pesticides	Aldrin	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Alpha BHC	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Alpha Chlordane	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Alpha Endosulfan	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Beta BHC	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Beta Endosulfan	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Delta BHC	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Dieldrin	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Endosulfan sulphate	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Endrin	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Endrin aldehyde	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Endrin ketone	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Heptachlor	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Heptachlor epoxide	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Hexachlorobenzene (HCB)	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Lindane (gamma BHC)	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Methoxychlor	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	p,p'-DDD	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	p,p'-DDE	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	p,p'-DDT	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	o,p'-DDD	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	o,p'-DDT	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	o,p'-DDE	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Gamma Chlordane	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	trans-Nonachlor	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Isodrin	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
	Mirex	0.1	µg/L	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

mg/L	milligrams per litre
µS/cm	microsiemens per centimetre
LOR	limit of reporting
PS	primary sample
Criteria	Criteria adopted from *Australian and New Zealand Environment and Conservation Council (ANZECC) Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) Australian and New Zealand Guidelines for Fresh and Marine Water Quality* - 'Primary Industries: Water quality for irrigation and general water use', 2000, and/or
	within criteria
	criteria exceeded

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Brendan Stuart
Client	PREMISE
Address	LEVEL 1 100 BRUNSWICK STREET FORTITUDE VALLEY QLD 4006
Telephone	61 2 6939 5000
Facsimile	(Not specified)
Email	Brendan.stuart@premise.com.au
Project	**217501 - Portland GD**
Order Number	**217501**
Samples	6

LABORATORY DETAILS

Manager	Shane McDermott
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	**SE276893 R0**
Date Received	17/1/2025
Date Reported	28/1/2025

COMMENTS

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

Anions Ion Chromatography - The Limit of Reporting (LOR) has been raised due to high conductivity of the sample requiring dilution.

SIGNATORIES

Akheeqar BENIAMEEN
Chemist

Dong LIANG
Metals/Inorganics Team Leader

Ly Kim HA
Organic Section Head

Ying Ying ZHANG
Laboratory Technician

OC Pesticides in Water [AN420] Tested: 20/1/2025

PARAMETER	UOM	LOR	MP-1 WATER - 15/1/2025 SE276893.001	MP-2 WATER - 15/1/2025 SE276893.002	MP-3 WATER - 15/1/2025 SE276893.003	MP-5 WATER - 15/1/2025 SE276893.004	MP-8 WATER - 15/1/2025 SE276893.005
Hexachlorobenzene (HCB)	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane (gamma BHC)	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Gamma Chlordane	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDD	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDD	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin aldehyde	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin ketone	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

OC Pesticides in Water [AN420] Tested: 20/1/2025 (continued)

PARAMETER	UOM	LOR	MP-9 WATER - 15/1/2025 SE276893.006
Hexachlorobenzene (HCB)	µg/L	0.1	<0.1
Alpha BHC	µg/L	0.1	<0.1
Lindane (gamma BHC)	µg/L	0.1	<0.1
Heptachlor	µg/L	0.1	<0.1
Aldrin	µg/L	0.1	<0.1
Beta BHC	µg/L	0.1	<0.1
Delta BHC	µg/L	0.1	<0.1
Heptachlor epoxide	µg/L	0.1	<0.1
o,p'-DDE	µg/L	0.1	<0.1
Alpha Endosulfan	µg/L	0.1	<0.1
Gamma Chlordane	µg/L	0.1	<0.1
Alpha Chlordane	µg/L	0.1	<0.1
trans-Nonachlor	µg/L	0.1	<0.1
p,p'-DDE	µg/L	0.1	<0.1
Dieldrin	µg/L	0.1	<0.1
Endrin	µg/L	0.1	<0.1
o,p'-DDD	µg/L	0.1	<0.1
o,p'-DDT	µg/L	0.1	<0.1
Beta Endosulfan	µg/L	0.1	<0.1
p,p'-DDD	µg/L	0.1	<0.1
p,p'-DDT	µg/L	0.1	<0.1
Endosulfan sulphate	µg/L	0.1	<0.1
Endrin aldehyde	µg/L	0.1	<0.1
Methoxychlor	µg/L	0.1	<0.1
Endrin ketone	µg/L	0.1	<0.1
Isodrin	µg/L	0.1	<0.1
Mirex	µg/L	0.1	<0.1

Total Phenolics in Water [AN295] Tested: 21/1/2025

PARAMETER	UOM	LOR	MP-1 WATER - 15/1/2025 SE276893.001	MP-2 WATER - 15/1/2025 SE276893.002	MP-3 WATER - 15/1/2025 SE276893.003	MP-5 WATER - 15/1/2025 SE276893.004	MP-8 WATER - 15/1/2025 SE276893.005
Total Phenols	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05

PARAMETER	UOM	LOR	MP-9 WATER - 15/1/2025 SE276893.006
Total Phenols	mg/L	0.05	<0.05

Anions by Ion Chromatography in Water [AN245] Tested: 21/1/2025

PARAMETER	UOM	LOR	MP-1 WATER - 15/1/2025 SE276893.001	MP-2 WATER - 15/1/2025 SE276893.002	MP-3 WATER - 15/1/2025 SE276893.003	MP-5 WATER - 15/1/2025 SE276893.004	MP-8 WATER - 15/1/2025 SE276893.005
Nitrate Nitrogen, NO3-N	mg/L	0.005	<0.005	**8.9**	**130**	<0.005	<0.005
Chloride	mg/L	1	**81**	**89**	**470**	**120**	**290**
Sulfate, SO4	mg/L	1	**310**	**160**	**640**	**760**	**1100**
Fluoride	mg/L	0.1	<0.10	**0.33**	**0.70**	**0.24**	<0.10

PARAMETER	UOM	LOR	MP-9 WATER - 15/1/2025 SE276893.006
Nitrate Nitrogen, NO3-N	mg/L	0.005	<0.025↑
Chloride	mg/L	1	**320**
Sulfate, SO4	mg/L	1	**1300**
Fluoride	mg/L	0.1	<0.10

Ammonia Nitrogen by Discrete Analyser [AN291] Tested: 17/1/2025

PARAMETER	UOM	LOR	MP-1 WATER - 15/1/2025 SE276893.001	MP-2 WATER - 15/1/2025 SE276893.002	MP-3 WATER - 15/1/2025 SE276893.003	MP-5 WATER - 15/1/2025 SE276893.004	MP-8 WATER - 15/1/2025 SE276893.005
Ammonia Nitrogen, NH_3 as N	mg/L	0.01	3.2	0.04	0.04	0.10	0.04

PARAMETER	UOM	LOR	MP-9 WATER - 15/1/2025 SE276893.006
Ammonia Nitrogen, NH_3 as N	mg/L	0.01	0.06

pH in water [AN101] Tested: 17/1/2025

PARAMETER	UOM	LOR	MP-1 WATER - 15/1/2025 SE276893.001	MP-2 WATER - 15/1/2025 SE276893.002	MP-3 WATER - 15/1/2025 SE276893.003	MP-5 WATER - 15/1/2025 SE276893.004	MP-8 WATER - 15/1/2025 SE276893.005
pH**	No unit	-	6.9	4.4	4.4	6.7	6.6

PARAMETER	UOM	LOR	MP-9 WATER - 15/1/2025 SE276893.006
pH**	No unit	-	6.8

Conductivity and TDS by Calculation - Water [AN106] Tested: 17/1/2025

PARAMETER	UOM	LOR	MP-1 WATER - 15/1/2025 SE276893.001	MP-2 WATER - 15/1/2025 SE276893.002	MP-3 WATER - 15/1/2025 SE276893.003	MP-5 WATER - 15/1/2025 SE276893.004	MP-8 WATER - 15/1/2025 SE276893.005
Conductivity @ 25 C	µS/cm	2	1400	660	3100	2200	3000

PARAMETER	UOM	LOR	MP-9 WATER - 15/1/2025 SE276893.006
Conductivity @ 25 C	µS/cm	2	3400

Alkalinity [AN135] Tested: 20/1/2025

PARAMETER	UOM	LOR	MP-1 WATER - 15/1/2025 SE276893.001	MP-2 WATER - 15/1/2025 SE276893.002	MP-3 WATER - 15/1/2025 SE276893.003	MP-5 WATER - 15/1/2025 SE276893.004	MP-8 WATER - 15/1/2025 SE276893.005
Total Alkalinity as CaCO3	mg/L	5	**370**	<5	<5	**550**	**570**

PARAMETER	UOM	LOR	MP-9 WATER - 15/1/2025 SE276893.006
Total Alkalinity as CaCO3	mg/L	5	**680**

Forms of Carbon [AN190] Tested: 22/1/2025

PARAMETER	UOM	LOR	MP-1 WATER - 15/1/2025 SE276893.001	MP-2 WATER - 15/1/2025 SE276893.002	MP-3 WATER - 15/1/2025 SE276893.003	MP-5 WATER - 15/1/2025 SE276893.004	MP-8 WATER - 15/1/2025 SE276893.005
Total Organic Carbon as NPOC	mg/L	0.2	59	20	7.7	2.8	6.2

PARAMETER	UOM	LOR	MP-9 WATER - 15/1/2025 SE276893.006
Total Organic Carbon as NPOC	mg/L	0.2	1.6

Metals in Water (Dissolved) by ICPOES [AN320] Tested: 21/1/2025

PARAMETER	UOM	LOR	MP-1 WATER - 15/1/2025 SE276893.001	MP-2 WATER - 15/1/2025 SE276893.002	MP-3 WATER - 15/1/2025 SE276893.003	MP-5 WATER - 15/1/2025 SE276893.004	MP-8 WATER - 15/1/2025 SE276893.005
Calcium, Ca	mg/L	0.2	140	34	150	310	390
Magnesium, Mg	mg/L	0.1	41	11	120	140	170
Sodium, Na	mg/L	0.5	69	72	370	96	210
Potassium, K	mg/L	0.1	130	27	7.0	14	9.3

PARAMETER	UOM	LOR	MP-9 WATER - 15/1/2025 SE276893.006
Calcium, Ca	mg/L	0.2	410
Magnesium, Mg	mg/L	0.1	260
Sodium, Na	mg/L	0.5	210
Potassium, K	mg/L	0.1	6.4

Trace Metals (Dissolved) in Water by ICPMS [AN318] Tested: 21/1/2025

PARAMETER	UOM	LOR	MP-1 WATER - 15/1/2025 SE276893.001	MP-2 WATER - 15/1/2025 SE276893.002	MP-3 WATER - 15/1/2025 SE276893.003	MP-5 WATER - 15/1/2025 SE276893.004	MP-8 WATER - 15/1/2025 SE276893.005
Iron	µg/L	5	**76**	**160**	**91**	<5	<5
Manganese	µg/L	1	**310**	**370**	**3900**	**260**	**4000**

PARAMETER	UOM	LOR	MP-9 WATER - 15/1/2025 SE276893.006
Iron	µg/L	5	<5
Manganese	µg/L	1	**950**

METHOD	METHODOLOGY SUMMARY
AN020	Unpreserved water sample is filtered through a 0.45µm membrane filter and acidified with nitric acid similar to APHA3030B.
AN101	pH in Soil Sludge Sediment and Water: pH is measured electrometrically using a combination electrode (glass plus reference electrode) and is calibrated against 3 buffers purchased commercially. For soils, an extract with water is made at a ratio of 1:5 and the pH determined and reported on the extract. Reference APHA 4500-H+.
AN106	Conductivity and TDS by Calculation: Conductivity is measured by meter with temperature compensation and is calibrated against a standard solution of potassium chloride. Conductivity is generally reported as µmhos /cm or µS/cm @ 25°C. For soils, an extract with water is made at a ratio of 1:5 and the EC determined and reported on the extract, or calculated back to the as-received sample. Total Dissolved Salts can be estimated from conductivity using a conversion factor, which for natural waters, is in the range 0.55 to 0.75. SGS use 0.6. Reference APHA 2510 B.
AN106	Salinity may be calculated in terms of NaCl from the sample conductivity. This assumes all soluble salts present , measured by the conductivity, are present as NaCl.
AN135	Alkalinity (and forms of) by Titration: The sample is titrated with standard acid to pH 8.3 (P titre) and pH 4.5 (T titre) and permanent and/or total alkalinity calculated. The results are expressed as equivalents of calcium carbonate or recalculated as bicarbonate, carbonate and hydroxide. Reference APHA 2320. Internal Reference AN135
AN190	TOC and DOC in Water: A homogenised micro portion of sample is injected into a heated reaction chamber packed with an oxidative catalyst that converts organic carbon to carbon dioxide. The CO2 is measured using a non-dispersive infrared detector. The process is fully automated in a commercially available analyser. If required a sugar value can be calculated from the TOC result. Reference APHA 5310 B.
AN190	Chemical oxygen demand can be calculated/estimated based on the O2/C relation as 2.67*NPOC (TOC). This is an estimate only and the factor will vary with sample matrix so results should be interpreted with caution.
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
AN291	Ammonia in solution reacts with hypochlorite ions from Sodium Dichloroisocyanuate, and salicylate in the presence of Sodium Nitroprusside to form indophenol blue and measured at 660 nm by Discrete Analyser.
AN295	The water sample or extract of sample is distilled in a phosphoric acid stream. Phenolic compounds in the distillate react with a reagent stream of potassium hexacyanoferrate(III) and 4-Amino-2,3-dimethyl-3-pryazolin-5-one in an alkaline medium to form a coloured complex which is analysed spectrophotometrically onboard a continuous flow analyser.
AN318	Determination of elements at trace level in waters by ICP-MS technique,, referenced to USEPA 6020B and USEPA 200.8 (5.4).
AN320	Metals by ICP-OES: Samples are preserved with 10% nitric acid for a wide range of metals and some non-metals. This solution is measured by Inductively Coupled Plasma. Solutions are aspirated into an argon plasma at 8000-10000K and emit characteristic energy or light as a result of electron transitions through unique energy levels. The emitted light is focused onto a diffraction grating where it is separated into components .
AN320	Photomultipliers or CCDs are used to measure the light intensity at specific wavelengths. This intensity is directly proportional to concentration. Corrections are required to compensate for spectral overlap between elements . Reference APHA 3120 B.
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).
Calculation	Free and Total Carbon Dioxide may be calculated using alkalinity forms only when the samples TDS is <500mg/L. If TDS is >500mg/L free or total carbon dioxide cannot be reported. APHA4500CO2 D.

FOOTNOTES

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

Unless it is reported that sampling has been performed by SGS, the samples have been 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 and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.