

Technical Memorandum



To: Outcross Agri Services (Tony Dean)
From: AWC – Adrian Leader, Will Dale
Date: 6 May 2024
Pg/Attach.: 13 pages plus attachment
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Northern Rivers Livestock Exchange (NRLX): Environmental Monitoring Report March 2024

AWC commenced routine environmental monitoring at the NRLX in September 2021, which includes extraction of groundwater samples from monitoring bores, collection of water samples from the storage/irrigation ponds and surface waters. Soil samples are also collected from the irrigation zone annually and results are included in a separate report. Under the current environmental protection license (EPL) quarterly collection of water samples from surface waters, storage/irrigation ponds and monitoring of ground water field parameters are required. Table 1 provides details of the EPL and project.

Water | Ecology | Management

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Table 1 Site and project details

NRLX	
Site Identification	Lot 1 DP 1240949 Dargaville Drive, Casino NSW 2470
Current reporting period	March 2024 (Quarterly monitoring)
EPL	3878 (17-April-2023)
Attachments	Attachment 1 Historic treated effluent quality monitoring results (Part 1) Attachment 2 Historic treated effluent quality monitoring results (Part 2) Attachment 3 Historic treated effluent quality monitoring results (Yearly) Attachment 4 Historic monitoring results (field parameters) for GW1, GW2 Attachment 5 Historic monitoring results for SW1 trigger event Attachment 6 Historic monitoring results for SW2 trigger event Attachment 7 Site Map Attachment 8 Laboratory sheets



Summary

The following is a summary of the monitoring results:

- All recorded values for effluent monitoring (EPA-1) were within their historic range apart from Thermotolerant Coliforms which recorded a new maximum value of (6700 cfu/100ml)
- Field parameters for groundwater typically exceeded relevant field monitoring WQOs
- Many laboratory analysis results of groundwater quality showed exceedance of respective WQOs
- All surface water concentrations are within the existing range, nonetheless many WQOs have been exceeded

1.1 Water Quality Objectives

Water Quality Objectives (WQO) were sourced from *Environmental Earth Services* (EES, 2019), as provided in Table 2 below and are attributable to groundwater and surface water. There are no trigger values as part of the EPL.

Table 2 Water Quality Objectives (Sourced ESS 2019)

Analyte	WQO	Analyte	WQO
pH	6.5 – 8.0	Total Nitrogen (TN) (mg/L)	0.35
EC (dS/m)	0.125 – 2.2	Oxidised Nitrogen (NOx) (mg/L)	0.04
Thermotolerant coliforms (cfu/100mL)	1000	Ammonia (mg/L)	0.02
BOD ₅ (mg/L)	15	Total Phosphorus (mg/L)	0.025
Total Suspended Solids (TSS) (mg/L)	40	Plant available Phosphorus (mg/L)	0.02
Chlorophyll 'a' (mg/L)	0.003		
Dissolved Oxygen (DO) (%)	85 - 110		

1.2 Weather Monitoring – Rainfall

Monthly rainfall totals recorded at the Casino Airport (BOM station 058208). Rainfall for January (137.6 mm) was above its respective historic average of 128.0 mm whereas February (98.8 mm) and March (135.2 mm) recorded values below their respective historic averages of 156.3 mm and 144.5 mm (refer Figure 1). There were no daily rainfall totals >50 mm that triggers surface water monitoring during the current reporting period.

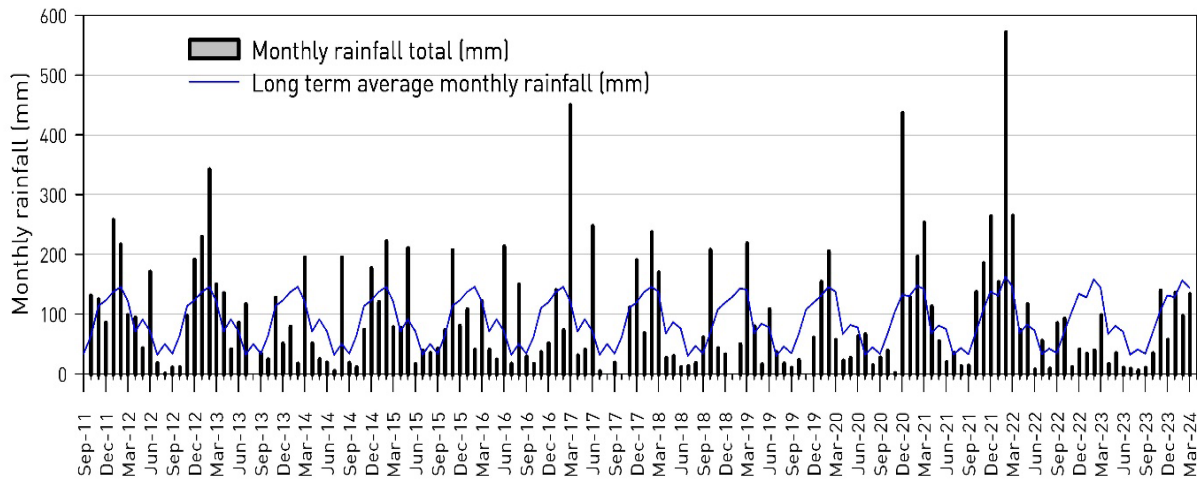


Figure 1 Monthly rainfall records and long-term averages Source: BOM station 058208 Casino Airport

2.0 Surface Water Monitoring - Routine

Routine surface water sampling was undertaken by AWC on the 27th of March 2024. The locations of the sampling sites are shown in the attached site plan. Table 3 provides details of the surface water sampling. EAL performed all analysis.

Table 3 Surface Water Quality Monitoring details

Surface Water Quality Monitoring sampling details – NRLX	
Sample date	27/03/2024
Sampled by	Will Dale (AWC)
Sample time	SW1 (11:30), SW2 (10:45)
Location	SW1 (EAP 7) & SW2(EPA 8) shown on the site plan attached
Sample collection methods	Grab samples are taken from surface water locations shown on the attached map. Each sample bottle is rinsed three times with sample water prior to filling the bottle. Sample bottle is capped, minimising the air bubbles in the bottle, kept cool (stored on ice) and out of direct sunlight and sent/delivered to EAL for analysis.
Sample analytes	Refer results tables below and laboratory results sheets attached
Sample frequency	Quarterly

2.1 Surface Water Quality Results

EAL performed all analysis. A summary of monitoring results compared with WQOs and summary statistics of the historic data set are provided in Table 4 and Table 5. Compared to the last round of surface water sampling, concentrations of Total Phosphorus and Phosphate are approximately equal at both SW1 and SW2. SW1 recorded elevated concentrations of TN and TKN compared with SW2 which may be contributed to Organic Nitrogen inputs by NRLX.

Key findings include:

SW1

- All analytes recorded values within their historic ranges
- Ammonia (0.075 mg/L), TN (2.43 mg/L), TP (0.1 mg/L), Suspended Solids (54 mg/L) and Thermotolerant Coliforms (1900 cfu/100 ml) recorded values outside their respective WQO
- Total Phosphorus (0.302 mg/L) and Suspended Solids (54 mg/L) recorded values above their respective 75th percentiles
- TDS (202 mg/L), EC (0.297 mg/L), Chlorophyll a (0.005 mg/L) and DOC (17.6 mg/L) values below their respective 25th percentiles

SW2

- All analytes recorded values within their historic ranges
- Ammonia (0.053 mg/L), Chlorophyll a (0.011 mg/L), TN (1.3 mg/L), TP (0.296 mg/L), Phosphate (0.109 mg/L) and Suspended Solids (55 mg/L) and Thermotolerant Coliforms (13000 mg/L) recorded values outside their respective WQO
- Thermotolerant Coliforms (13000 mg/L) recorded a value above its respective 75th percentile
- EC (0.204 dS/m), Total Dissolved Salts (204 mg/L), BOD (32 mg/L) DOC (17.4 mg/L), TN (1.3 mg/L) and Total Phosphorus (0.296 mg/L) recorded values below their respective 25th percentiles

Table 4 Current results for SW1 with a summary statistics of the historic data set

SW1 – current monitoring results, WQOs and summary statistics								
Parameter	WQOs	Current	Min.	Max.	Mean	Median	25 th %ile	75 th %ile
pH	6.5-8.0	7.26	6.18	8.38	7.44	7.465	7.015	7.925
EC	0.125-2.2 dS/m	0.297	0.01 54	5.082	1.20	1.12	0.347	1.48
TDS	-	202.00	110	1648	675.31	718	230.5	938
Ammonia (as N)	0.02	0.075	0.00 5	8.69	0.63	0.075	0.0247 5	0.329
(BOD-5 Day)	15	2.60	1	13.2	3.95	3.2	1.9	5
Chlorophyll a	0.003	0.005	0.00 5	7.5	0.78	0.027	0.0135	0.104
Dissolved Organic Carbon	-	17.6	14	43.8	24.37	21.7	17.75	29.15
Nitrate & Nitrite (as N)	-	1.546	0.01	13.34 4	1.49	0.1545	0.021	1.7705
Nitrate (as N)	-	1.51	0.00 5	12.97	1.42	0.116	0.0125	1.705
Nitrite (as N)	-	0.036	0.00 5	0.374	0.08	0.02	0.011	0.0982 5
Total Kjeldahl Nitrogen (as N)	-	0.98	0.8	9.52	2.32	1.8	1.14	2.8
Total Nitrogen (as N)	0.35	2.43	0.8	17.32 2	3.90	2.43	1.7	3.73
Total Phosphorus (mg/L P)	0.025	0.302	0.05	1.26	0.19	0.1	0.06	0.16
Phosphate (mg/L P)	0.02	0.1	0.00 5	0.208	0.06	0.03	0.013	0.1
Suspended Solids	40	54	4	527	51.40	25	11	38
Thermotolerant Coliforms	1000	1900	10	65000	5776.3 9	1730	180	4550
Shaded and bold denotes exceedance of WQO								

Table 5 Current results for SW2 with a summary statistics of the historic data set

SW2 – current monitoring results, WQOs and summary statistics								
Parameter	WQOs	Current	Min.	Max.	Mean	Median	25 th %ile	75 th %ile
pH	6.5-8.0	6.94	6.24	8.85	7.14	6.98	6.57	7.65
EC	0.125-2.2 dS/m	0.204	0.204	1.24	0.60	0.577	0.38	0.72
TDS	-	204	160	841	448.82	418	309.00	572.00
Ammonia (as N)	0.02	0.053	0.005	1.3	0.17	0.0555	0.02	0.14
(BOD-5 Day)	15	3.2	2.4	175	15.31	5	3.60	9.10
Chlorophyll a	0.003	0.011	0.004	5	0.65	0.085	0.01	0.22
Dissolved Organic Carbon	-	17.4	16	53.6	29.44	24.6	18.18	42.85
Nitrate & Nitrite (as N)	-	0.155	0.01	1.57	0.29	0.0425	0.02	0.62
Nitrate (as N)	-	0.137	0.005	1.491	0.23	0.019	0.01	0.44
Nitrite (as N)	-	0.018	0.005	0.47	0.06	0.02	0.01	0.06
Total Kjeldahl Nitrogen (as N)	-	1.15	1	57.2	5.49	2.2	1.23	3.602
Total Nitrogen (as N)	0.35	1.3	1.13	57.2	5.59	2.36	1.36	3.85
Total Phosphorus (mg/L P)	0.025	0.296	0.28	31.7	3.09	0.66	0.33	2.4575
Phosphate (mg/L P)	0.02	0.109	0.01	3.74	0.59	0.1735	0.09875	0.5815
Suspended Solids	40	55	8	30540	1747.09	53	19	286
Thermotolerant Coliforms	1000	13000	100	188000	16375.0	2970	287.5	12250

Shaded and bold denotes exceedance of WQO

3.0 Treated Effluent Monitoring

Sampling was undertaken by AWC in accordance with the EP Licence and EPA approved guidelines. Table 6 provides details of the effluent sampling. EAL performed all analysis.

Table 6 Treated Effluent Quality Monitoring details

Treated Effluent Quality Monitoring (EPA1) sampling details – NRLX	
Sample date	27/03/2024
Sampled by	Will Dale (AWC)
Sample time	10:35
Location	EPA1 shown on the site plan attached
Sample collection methods	Grab sample extracted from treatment pond adjacent the pump station: Sample bottle is rinsed three times with sample water prior to filling the bottle. Sample bottle is capped, minimising the air bubbles in the bottle, kept cool (stored on ice) and out of direct sunlight and sent/delivered to EAL for analysis.
Sample analytes	Refer results tables and laboratory results sheets attached for quarterly and yearly monitoring results
Sample frequency	Annual

3.1 Treated Effluent Quality Results

Monitoring of treated effluent provides an indication of the quality of water that is disposed of via irrigation. This is the thirteenth round of sampling conducted by AWC, however there is historic data (2017-2020) that will be included in the graphs and statistical summary. Table 7 shows the current monitoring results along with summary statistics of the total data set for context. Figure 2 shows selected historic monitoring results in graph form. The entire data set including results from the yearly monitoring requirements and laboratory results sheet are included as an attachment.

Key findings of the treated effluent monitoring include:

- All concentrations were within their historic range except Thermotolerant Coliforms which recorded a new maximum value of (6700 cfu/100ml)
- Suspended Solids (145 mg/L), SAR (4.6) and Thermotolerant Coliforms (6700 cfu/100ml) recorded values above their respective 75th percentiles
- The SAR value of 4.6 is in the preferred range of <6, with the relationship to EC being in the preferred range in accordance with the DEC (2004) (*Environmental Guidelines: Use of Effluent for Irrigation*)
 - Effluent with a SAR (sodium adsorption ratio) of greater than 6 has been shown to raise exchangeable sodium percentage (ESP) in non sodic soils, creating soils with poor structure that are susceptible to dispersion where effluent with a SAR of less than 3 may lower ESP in sodic soils.

Table 7 Treated effluent monitoring - current results and summary statistics of historic data set (select parameters)

	Unit	Current result	n	Min.	Max.	Mean	75 th %ile	Median	25 th %ile
Electrical Conductivity	(dS/m)	1.33	41	0.419	2.211	1.41	1.69	1.47	1.21
pH		8.69	41	7.62	9.53	8.62	9.07	8.58	8.13
Reactive Phosphorus	(mg/L)	2.02	40	0.434	10.7	3.86	4.53	3	1.947
Total Phosphorus	(mg/L)	2.44	41	1.3	13	5.37	6.04	4.73	3.09
Suspended Solids	(mg/L)	145	41	11	1500	137.52	139	84	37.5
Total Dissolved Solids	(mg/L)	913	15	323	1503	792.84	967	816	504
Total Nitrogen	(mg/L)	7.7	41	1.9	14	6.72	8.90	6.31	3.915
Alkalinity as calcium carbonate	(mg/L)	399	25	112	620	398.32	500	410	310
Sodium	(mg/L)	127	25	38.7	1100	319.45	537.5	127	99.5
Sodium Adsorption Ratio		4.6	15	1.9	5.4	3.48	4.08	3.4	2.3
Thermotolerant Coliforms	(cfu / 100ml)	6700	7	80	6700	2255.71	2600	1960	610

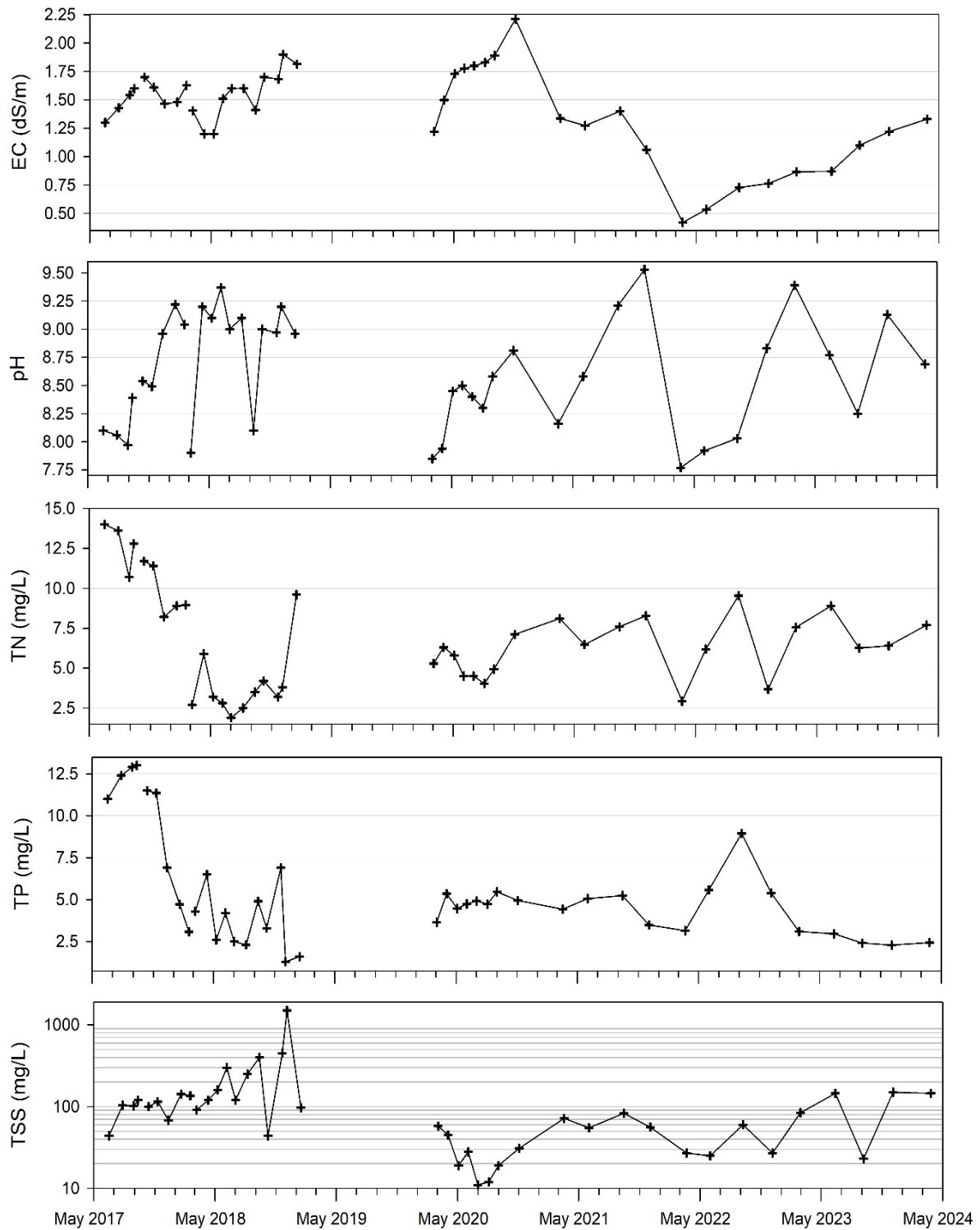


Figure 2 Historic treated effluent quality monitoring, select parameters (AWC commenced monitoring in March 2021)

4.0 Groundwater Quality Monitoring

Three groundwater monitoring bores have samples extracted on a quarterly basis with field parameters recorded and laboratory analysis undertaken on a six-monthly basis. The locations of the bores are shown in the attached site plan. Groundwater is required to be sampled as part of EPL requirements via the *NRLX Water Monitoring Plan* (AWC, 2017) being *Section 8 Pollution Studies and Reduction Programs, Clause U1 Water Quality Monitoring Program*. Table 8 provides details of the groundwater sampling.

Table 8 Groundwater Quality Monitoring details

Groundwater Quality Monitoring sampling details – NRLX			
Sample date	27/03/2024		
Sampled by	Will Dale (AWC)		
Sample time	GW1 (EPA 4) 8:10	GW2 (EPA 5) 7:45	GW3 (EPA 6) 8:40
Location	GW1, GW2 and GW3; shown on the site plan attached		
Sample collection methods	Groundwater samples are extracted using a 50mm submersible bore pump. Bore purging followed methods set out in Sandaran <i>et al.</i> (2009); briefly, at least three times the volume of the bore (3 x πr^2 x height) was extracted before field parameters are recorded and laboratory samples are collected (6-monthly)		
Sample analytes	Refer results tables below		
Sample frequency	Quarterly (some analytes only analysed quarterly)		

4.1 Groundwater Quality Monitoring Results

Scheduled monitoring of field parameters (pH, Conductivity, ORP, DO and Temperature) with a calibrated water quality probe and collection of a representative sample for analysis of selective analytes by a NATA approved laboratory are required during the biannual reporting period for NRLX groundwater monitoring locations. Field results are shown in Table 9 and within Attachments 4. Historic groundwater results are shown in Figure 3 while current results and summary statistics of historic data set are shown in Tables 10, 11 and 12.

Key findings of the recent groundwater monitoring are as follows:

Field results

- EC values for groundwater at bores GW2 and GW3 are higher than the WQO of 2.2 dS/m
- The recorded values for pH at all groundwater bores were below the WQO range of 6.5
- DO values for all groundwater bores were below the WQO of 85-110%

GW1

- Sodium (120 mg/L), Magnesium (7.41 mg/L) and TSS (1834 mg/L) recorded new minimum values
- Nitrite (0.055 mg/L), TKN (4.25 mg/L), Potassium (11.2 mg/L) and Organic N (4.18 mg/L) recorded new maximum values
- TSS (1834.00 mg/L), Ammonia (0.071 mg/L), TP (1.8 mg/L) and TN (4.37 mg/L) recorded values above their respective WQO
- TDS (1033.00 mg/L), Calcium (8 mg/L), Magnesium (7.41 mg/L), Sodium (120 mg/L) and Chloride (125 mg/L) recorded a values below their 25th percentiles

GW2

- TSS (468mg/L) and Phosphorus (0.37 mg/L) recorded values above their respective WQO
- TKN (0.01 mg/L), TN (0.01 mg/L) and Potassium (0.916 mg/L) recorded new minimum values
- TSS (468 mg/L), recorded values below its respective 25th percentiles
- Phosphate, Nitrite and Ammonia recorded a value below their detection limits of 0.005 mg/L

GW3

- Sulfur (41 mg/L) recorded a new maximum value
- TDS (1752 mg/L), , and Potassium (1.4 mg/L) recorded new minimum values
- TSS (410 mg/L) and TP (0.43mg/L) recorded values above their respective WQO
- Chloride (1048 mg/L) and Sulfur (41 mg/L) recorded values above its respective 75th percentile
- TDS (1752 mg/L), TSS (410 mg/L), DOC (0.9 mg/L) Organic N (0.00 mg/L), TN (0.01 mg/L), Calcium (73.2 mg/l) recorded values below their respective 25th percentiles

Ammonia, Nitrate, Nitrite, TKN and TN recorded a value below their detection limits

Table 9 Groundwater field monitoring results

Groundwater Field Monitoring sampling details – NRLX				
Sampled by		Will Dale (AWC)		
Site		GW1	GW2	GW3
Sample time		8:10	7:45	8:40
Parameters	WQO			
Purge Volume (L)		35	43	43
Depth (mBGL)		1.01	2.36	0.20
EC (ds/m)	0.25-2.2	0.936	5.038	3.881
pH	6.5-8.0	6.23	5.75	6.23
ORP		15.59	42.36	14.52
DO (%)	85-110	65.02	37.27	42.02
Temp		23.28	22.1	21.2
Odour		None	None	None
Colour		Cloudy Brown/ Turbid	Cloudy Grey/Turbid	Pale Brown/ Turbid
Bold and shaded cell denotes outside WQO value range mBGL= m below ground level TOC= top of cast				

Table 10 GW1 current results and summary statistics of historic data set

	Unit	Current result	n	Min.	Max.	Mean	75 th %ile	Media n	25 th %ile
TDS	(mg/L)	1033	9	426	2797	1741.67	2440	1724	1035
TSS	(mg/L)	1834.	9	1834	23900	7233.78	9780	5340	2305
Ammonia (mg/L)	(mg/L)	0.071	9	0.034	0.959	0.23	0.3155	0.071	0.0545
Dissolved Organic Carbon	(mg/L)	59.9	8	8.5	75.9	31.86	54.52	20.35	14.325
Nitrate & Nitrite (as N)	(mg/L)	0.119	9	0.014	0.345	0.09	0.109	0.055	0.03
Nitrate (as N)	(mg/L)	0.06	9	0.005	0.319	0.06	0.062	0.02	0.01
Nitrite (as N)	(mg/L)	0.055	9	0.006	0.055	0.02	0.04	0.019	0.0085
Organic Nitrogen (as N)	(mg/L)	4.18	9	0.13	4.18	1.33	1.751	1.065	0.5095
Phosporus total (as P)	(mg/L)	1.8	9	0.021	13.3	2.54	3	0.924	0.315
Phosporus filterable reactive	(mg/L)	0.062	9	0.006	0.29	0.06	0.0815	0.024	0.014
Total Kjeldahl Nitrogen (as N)	(mg/L)	4.251	9	0.23	4.251	1.56	2.13	1.325	0.665
Total Nitrogen (as N)	(mg/L)	4.37	9	0.29	4.37	1.65	2.171	1.57	0.715
Calcium	(mg/L)	8	8	8.15	39.5	23.27	31.925	21	16.55
Magnesium	(mg/L)	7.41	8	7.41	36.7	26.10	35.05	30.5	17.73
Potassium	(mg/L)	11.2	8	1.7	11.2	5.63	7.6575	5.53	2.47
Sodium	(mg/L)	120	8	120	825	501	768.5	550	186.25
Chloride	(mg/L)	125	8	124	1148	652.13	1072.25	733	151.5
Sulfur	(mg/L)	24	6	15	43.1	25.85	36.275	23.8	15.3

Table 11 GW2 current results and summary statistics of historic data set

	Unit	Current result	<i>n</i>	Min.	Max.	Mean	75 th %ile	Median	25 th %ile
TDS	(mg/L)	3396	9	2217	4612	3259.11	4053.50	3108.00	2584.00
TSS	(mg/L)	468	9	187	2930	1499.33	2560.00	1082.00	513.00
Ammonia (mg/L)	(mg/L)	0.005	9	0.005	0.175	0.06	0.10	0.05	0.01
Dissolved Organic Carbon	(mg/L)	1.6	8	1.5	21.8	6.85	10.50	3.90	1.68
Nitrate & Nitrite (as N)	(mg/L)	0.02	9	0.005	0.091	0.03	0.05	0.02	0.01
Nitrate (as N)	(mg/L)	0.012	9	0.005	0.091	0.02	0.04	0.01	0.01
Nitrite (as N)	(mg/L)	0.005	9	0.005	0.011	0.01	0.01	0.01	0.01
Organic Nitrogen (as N)	(mg/L)	0.00	9	0.00	0.394	0.15	0.30	0.11	0.03
Phosphorus total (as P)	(mg/L)	0.37	9	0.024	1.51	0.76	1.35	0.82	0.25
Phosphorus filterable reactive	(mg/L)	0.005	9	0.005	0.06	0.02	0.03	0.02	0.01
Total Kjeldahl Nitrogen (as N)	(mg/L)	0.01	9	0.003	0.45	0.21	0.41	0.13	0.092
Total Nitrogen (as N)	(mg/L)	0.01	9	0.01	0.54	0.23	0.42	0.17	0.10
Calcium	(mg/L)	30.2	8	10.8	52.4	33.58	44.43	34.95	20.95
Magnesium	(mg/L)	75.1	8	55	152	86.95	112.48	74.90	60.83
Potassium	(mg/L)	0.916	8	0.916	2.38	1.64	2.23	1.64	1.08
Sodium	(mg/L)	868	8	679	1221	883.75	1055.25	826.00	701.75
Chloride	(mg/L)	1538	8	1110	1893	1479.13	1794.75	1493.00	1126.25
Sulfur	(mg/L)	18	8	3	24	11.90	21.00	7.75	6.18

Table 12 GW3 current results and summary statistics of historic data set

	Unit	Current result	<i>n</i>	Min.	Max.	Mean	75 th %ile	Median	25 th %ile
TDS	(mg/L)	1752	9	1752	2751	2538.22	2710.50	2669	2476
TSS	(mg/L)	410	9	83	2290	1178.67	2036.50	990	470
Ammonia (mg/L)	(mg/L)	0.005	9	0.005	0.104	0.04	0.08	0.047	0.005
Dissolved Organic Carbon	(mg/L)	0.9	8	0.9	25.9	8.75	11.68	7.65	2.4
Nitrate & Nitrite (as N)	(mg/L)	0.01	9	0.005	0.228	0.05	0.06	0.016	0.01
Nitrate (as N)	(mg/L)	0.005	9	0.005	0.218	0.04	0.05	0.005	0.005
Nitrite (as N)	(mg/L)	0.005	9	0.005	0.011	0.01	0.01	0.005	0.005
Organic Nitrogen (as N)	(mg/L)	0.00	8	0.00	0.868	0.20	0.48	0.0095	0.00075
Phosphorus total (as P)	(mg/L)	0.43	9	0.019	2.14	0.76	1.15	0.59	0.26
Phosphorus filterable reactive	(mg/L)	0.016	9	0.01	0.1	0.03	0.03	0.017	0.0155
Total Kjeldahl Nitrogen (as N)	(mg/L)	0.01	10	0.01	0.97	0.20	0.29	0.06	0.01
Total Nitrogen (as N)	(mg/L)	0.01	9	0.01	1.2	0.27	0.43	0.11	0.015
Calcium	(mg/L)	73.2	8	71.6	89.1	79.83	86.88	78.15	73.825
Magnesium	(mg/L)	64.5	8	57	77.8	66.34	69.55	66	62.475
Potassium	(mg/L)	1.4	8	1.4	2.6	1.96	2.39	1.95	1.4825
Sodium	(mg/L)	673	8	635	728	691.88	713.75	702.5	673
Chloride	(mg/L)	1048	8	758	1060	958.25	1038.50	974.5	907.25
Sulfur	(mg/L)	41	8	10	34	20.15	33.05	11.9	11.05

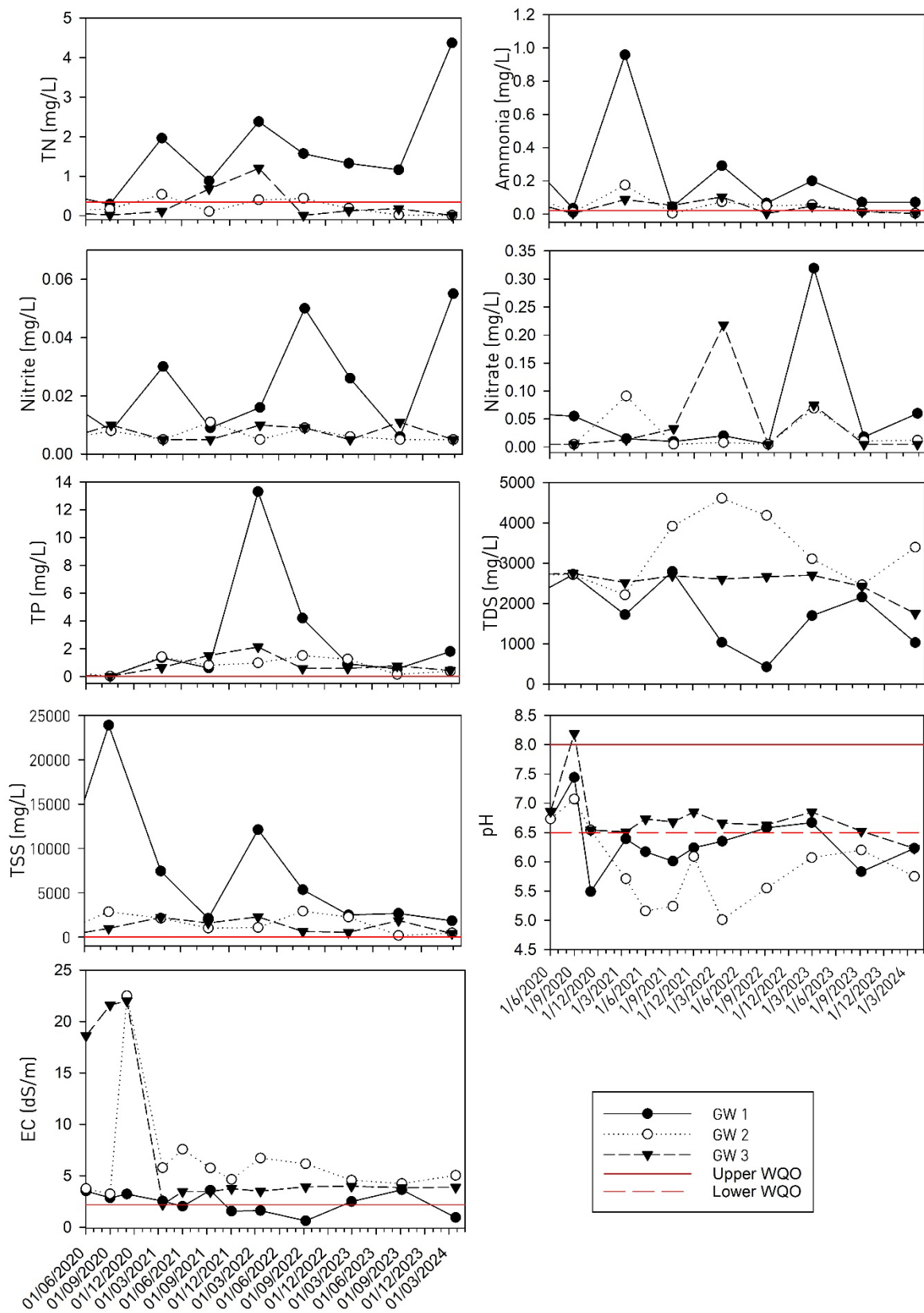


Figure 3 Historical groundwater results for selected parameters

Attachment 1 Historic treated effluent quality monitoring results (Part 1)

Date	Sampler	Electrical Conductivity	pH	Reactive Phosphorus	Total Phosphorus	Suspended Solids	Total Dissolved Solids	Total Nitrogen	Alkalinity (as calcium carbonate)	Sodium	Sodium Adsorption Ratio	Thermotolerant Coliforms
		(dS/m)		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)		(cfu / 100ml)
Monitoring Frequency		Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	##	Quarterly	Yearly
16/06/2017		1.30	8.1	10.1	11.0	44	NR	14.0	390	468	NR	NR
27/07/2017		1.43	8.06	9.76	12.4	104	NR	13.6	NR	NR	NR	NR
29/08/2017		1.54	7.97	10.7	12.9	102	NR	10.7	NR	NR	NR	NR
12/09/2017		1.60	8.39	9.9	13.0	120	NR	12.8	NR	NR	NR	NR
12/09/2017		NR	NR	NR	NR	NR	NR	NR	520	545	NR	NR
13/10/2017		1.70	8.54	7.2	11.5	100	NR	11.7	NR	NR	NR	NR
10/11/2017		1.61	8.49	9.42	11.35	115.12	NR	11.4	NR	NR	NR	NR
12/12/2017		1.466	8.96	4.97	6.9	68	NR	8.21	480	563	NR	NR
19/01/2018		1.48	9.22	2.663	4.72	142	NR	8.91	540	530	NR	NR
16/02/2018		1.627	9.04	1.93	3.08	136	NR	8.96	NR	NR	NR	NR
12/12/2017		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
7/03/2018		1.404	7.9	2.9	4.3	91	NR	2.7	410	140	NR	2400
11/04/2018	RVC	1.2	9.2	2.6	6.5	120	NR	5.9	NR	NR	NR	NR
9/05/2018	RVC	1.2	9.1	2.6	2.6	160	NR	3.2	NR	NR	NR	NR
6/06/2018	EES	1.51	9.37	2	4.2	300	NR	2.8	520	960	NR	NR
2/07/2018	RVC	1.6	9	<0.05	2.5	120	NR	1.9	NR	1000	NR	NR
7/08/2018	RVC	1.6	9.1	1.8	2.3	250	NR	2.5	NR	1100	NR	NR
12/09/2018	EES	1.41	8.1	1.8	4.9	400	NR	3.5	620	1000	NR	NR
8/10/2018	RVC	1.7	9	1.4	3.3	44	NR	4.2	NR	NR	NR	NR
20/11/2018	EES	1.682	8.97	3.1	6.9	450	NR	3.2	530	170	NR	NR
4/12/2018	RVC	1.9	9.2	0.8	1.3	1500	NR	3.8	NR	NR	NR	NR
15/01/2019	RVC	1.815	8.96	1.1	1.6	97	NR	9.6	NR	NR	NR	NR
1/02/2019	RVC	Dry Ponds – no samples taken										
1/03/2019	EES											
1/04/2019	RVC											
1/05/2019	RVC											
1/06/2019	EES											
1/07/2019												
1/08/2019												
1/09/2019												
1/10/2019												
1/11/2019												
1/12/2019												
1/01/2020												
1/02/2020												
3/03/2020	EES											
2/04/2020	RVC	1.498	7.94	3.981	5.35	45	NR	6.31	NR	NR	NR	NR
4/05/2020	RVC	1.73	8.45	2.77	4.47	19	NR	5.8	NR	NR	NR	NR
2/06/2020	EES	1.777	8.5	3.86	4.74	28	NR	4.5	480	171	NR	NR

Attachment 2 Historic treated effluent quality monitoring results (Part 2)

Date	Sampler	Electrical Conductivity	pH	Reactive Phosphorus	Total Phosphorus	Suspended Solids	Total Dissolved Solids	Total Nitrogen	Alkalinity (as calcium carbonate)	Sodium ##	Sodium Adsorption Ratio	Thermotolerant Coliforms
		(dS/m)		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)		(cfu / 100ml)
Monitoring Frequency		Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	##	Quarterly	Yearly
	RVC	1.8	8.4	4.25	4.92	11	NR	4.5	NR	NR	NR	NR
3/08/2020	RVC	1.829	8.3	4.47	4.73	12	NR	4.03	NR	NR	NR	80
1/09/2020	EES	1.89	8.58	4.47	5.46	19	1285	4.93	605	NR	5.2	NR
3/11/2020	EES	2.211	8.81	0.434	4.95	31	1503	7.12	395	NR	5.4	NR
18/03/2021	AWC (AL)	1.336	8.16	3.637	4.428	72	936	8.107	462	131.73	4.08	1960
01/06/2021	AWC (AL)	1.273	8.58	4.21	5.06	55	816	6.48	193	104	3.3	NR
14/09/2021	AWC (AL)	1.4	9.21	3.54	5.24	83	967	7.6	466	125	3.7	NR
3/12/2021	AWC (AL)	1.06	9.53	2.32	3.49	56	447	8.28	411	109	3.8	NR
21/03/2022	AWC (AL)	0.419	7.77	2.53	3.15	27	323	2.93	140	38.7	1.9	610
1/06/2022	AWC (AL)	0.535	7.62	4.98	5.57	25	425	6.19	195	47.1	2	NR
08/09/2022	AWC (AL)	0.727	8.03	5.17	8.95	60	504	9.54	254	65	2.3	NR
6/12/2022	AWC (AL)	0.763	8.83	4.55	5.39	27	605	3.67	280	60.7	2.3	NR
28/02/2023	AWC (AL)	0.866	9.39	1.86	3.1	84	712	7.56	112	86.6	3.2	2600
06/09/2023	AWC (AL)	1.1	8.25	1.98	2.41	23	860	6.26	408	107	3.4	1440
04/12/2023	AWC (WD)	1.22	9.13	1.45	2.29	150	971	6.4	449	122	3.8	NR
27/03/2024	AWC (WD)	1.33	8.69	2.02	2.44	145	913	7.7	399	127	4.6	6700

##=no longer required as part of EPL
 NR = not required during the monitoring period
 Values in red denote results reported as less than (<)

Attachment 3 Historic treated effluent quality monitoring results (Yearly)

Date	Sampler	Aluminium	Arsenic	Beryllium	Cadmium	Chromium (hexavalent)	Cobalt	Copper	Iron	Lead	Lithium	Manganese	Mercury	Molybdenum	Nickel	Selenium	Zinc
18/03/2021	AWC (AL)	0.175	0.002	0.001	0.001	0.001	0.001	0.001	0.967	0.001	0.001	0.342	0.0005	0.001	0.001	0.002	0.003
21/03/2022	AWC (AL)	0.088	0.002	0.005	0.001	0.001	0.001	0.001	0.508	0.001	0.001	0.14	0.0005	0.001	0.001	0.002	0.002
28/02/2023	AWC (AL)	1.04	0.005	0.005	0.001	0.001	0.001	0.001	0.055	0.001	0.001	0.044	0.0005	0.001	0.001	0.002	0.003
27/03/2023	AWC (WD)	0.223	0.006	0.005	0.001	0.004	0.001	0.001	0.318	0.001	0.001	0.029	0.0005	0.001	0.001	0.002	0.01

Values in red denote results reported as less than (<)

Attachment 4 Historic monitoring results (field parameters) for GW1, GW2 and GW3

Sampler	Date	Time	Purge Volume (L)	EC (dS/m)	pH	ORP	DO	Temp	Odour	Colour
GW1 (EPA4) Field Parameters										
Trigger values				0.25-2.2	6.5-8.0		85-110			
Michael K - EES	3/03/2020		12	3.21	6.21	-88.00		24.30	none	Cloudy brown
Amy Whitley - EES	2/06/2020		13	3.52	6.73	60.80		20.30	none	Milky brown
Daniel White - EES	1/09/2020		14	2.85	7.44	-64.00		20.40	none	Brown turbid
Daniel White- EES	3/11/2020		10	3.23	5.49	85.00		20.50	none	Brown turbid
AWC (AL)	18/03/2021	12:00	49	2.54	6.39	128.90	51.0	26.70	none	cloudy/milky
AWC (AL)	1/06/2021	12:30	35	2.03	6.17	179.80	53.2	20.30	none	Milky brown
AWC (JM)	*21/06/2021	14:20	30	2.39	4.28	405.00	47.2	-	none	Yellow/brown
AWC (AL)	14/09/2021	10:20	27	3.6	6.01	105.80	55.0	21.20	none	Milky brown
AWC (AL)	3/12/2021	13:25	32	1.56	6.24	43.6	38.91	26.23	None	Milky/Brown
AWC (AL)	21/03/2022	12:00	35	1.62	6.35	86.00	36.0	23.10	None	Milky brown/ turbid
AWC (AL)	2/06/2022	12:45	33	0.76	6.13	165	82	21.6	None	Milky brown
AWC (AL)	8/09/2022	14:00	31	0.995	6.88	36	34.1	21.8	None	Cloudy Brown/ Turbid
AWC (AL)	28/02/2023	10:30	28	2.504	6.25	33.00	19.01	26.10	None	Cloudy Brown/ Turbid
AWC (AL)	13/06/2023	12:30	29	2.95	6.15	24.1	18.35	24.5	None	Cloudy Brown/ Turbid
AWC (AL)	06/09/2023	12:00	27	3.6	5.83	-69.8	41.9	23.7	None	Cloudy Brown/ Turbid
AWC (WD)	4/12/2023	16:40	25	2.7	6.18	74	32.08	28	None	Cloudy Brown/ Turbid
AWC (WD)	27/03/2024	8:10	35	0.936	6.23	15.59	65.02	23.28	None	Cloudy Brown/turbid
GW2 (EPA5) Field Parameters										
Michael K - EES	3/03/2020		22	3.89	6.06	-81.40		24.80	none	Cloudy
Amy Whitley - EES	2/06/2020		15	3.75	6.73	20.00		20.70	none	Cloudy brown
Daniel White - EES	1/09/2020		17	3.23	7.07	64.00		21.70	none	Cloudy brown
Daniel White- EES	3/11/2020		-	22.5	6.54	86.00		20.80	none	Brown
AWC (AL)	17/03/2021	12:25	47	5.78	5.71	162	30.08	22.3	none	Milky / cloudy
AWC (AL)	1/06/2021	11:45	47	7.57	5.61	421	45.5	21.6	none	Cloudy/Reddish/Brown
AWC (JM)	*21/06/2021	14:40	42	5.39	6.31	150	54.9	-	none	Brownish yellow
AWC (AL)	14/09/2021	9:50	39	5.24	6.1	73.9	55	20.1	none	Brownish yellow
AWC (AL)	3/12/2021	13:00	42	4.64	6.09	31.3	36.06	24.66	None	Cloudy/Reddish/Brown
AWC (AL)	21/03/2022	11:00	50	6.71	5.01	71	32.1	23.4	none	Cloudy brown
AWC (AL)	2/06/2022	12:00	46	6.15	4.61	341	65.59	21.2	none	Cloudy brown
AWC (AL)	8/09/2022	13:30	45	5.98	5.98	107	60	22.1	none	Cloudy brown/yellow
AWC (AL)	28/02/2023	11:00	42	4.581	6.19	25	59	26.88	None	Cloudy brown
AWC (AL)	13/06/2023	12:00	41	4.75	5.93	104	23.9	22.6	None	Cloudy brown
AWC (AL)	06/09/2023	11:40	40	4.24	6.2	-143.04	44.8	28.8	None	Clear
AWC (WD)	4/12/2023	16:00	40	3.57	6.61	134	86.77	24.64	none	Cloudy brown
AWC (WD)	27/03/2024	7:45	43	5.038	5.75	42.36	37.27	22.1	none	Cloudy grey, Turbid
GW3 (EPA6) Field Parameters										
Michael K - EES	3/03/2020		12	19	6.47	-83.00		24.90	none	Milky
Amy Whitley - EES	2/06/2020		20	18.6	6.86	2.60		19.30	slight anoxic odour	Dark brown (black sediment)
Daniel White - EES	1/09/2020		15	21.6	8.19	78.00		19.90	None	Cloudy brown
Daniel White- EES	3/11/2020		-	22	6.54	86.00		20.80	None	Brown
AWC (AL)	17/03/2021	12:50	35	2.2	6.51	166	48.5	23.7	none	milky / cloudy
AWC (AL)	1/06/2021	13:00	43	3.467	6.73	199	21.8	19.9		
AWC (JM)	*21/06/2021	13:50	40	3.77	5.49	77	68.7	-	none	Yellowish/brown
AWC (AL)	14/09/2021	10:45	40	3.46	6.68	11.3	56.8	21.1	none	milky / cloudy
AWC (AL)	3/12/2021	14:15	43	3.76	6.85	14.14	68.3	22.58	None	Milky
AWC (AL)	21/03/2022	11:35	45	3.5	6.66	29.0	41.0	23.1	none	Milky
AWC (AL)	2/06/2022	13:30	45	4.28	6.49	92.8	24.13	21.7	none	Milky
AWC (AL)	8/09/2022	14:50	43	3.77	6.52	60	33.2	20.9	none	Milky brown
AWC (AL)	28/02/2023	12:00	44	4.01	6.58	100	53.36	26.1	none	Cloudy

Sampler	Date	Time	Purge Volume (L)	EC (dS/m)	pH	ORP	DO	Temp	Odour	Colour
AWC (AL)	13/06/2023	13:00	42	4.52	6.46	31.3	27.5	21.96	none	Cloudy
AWC (AL)	6/09/2023	12:30	40	3.84	6.52	-33.8	35.5	22.3	none	Cloudy
AWC (WD)	4/12/2023	17:10	40	4.24	6.29	141.2	47.7	22.87	none	Cloudy
AWC (WD)	27/03/2024	8:40	43	3.881	6.23	14.52	42.02	21.2	none	Pale brown / Turid

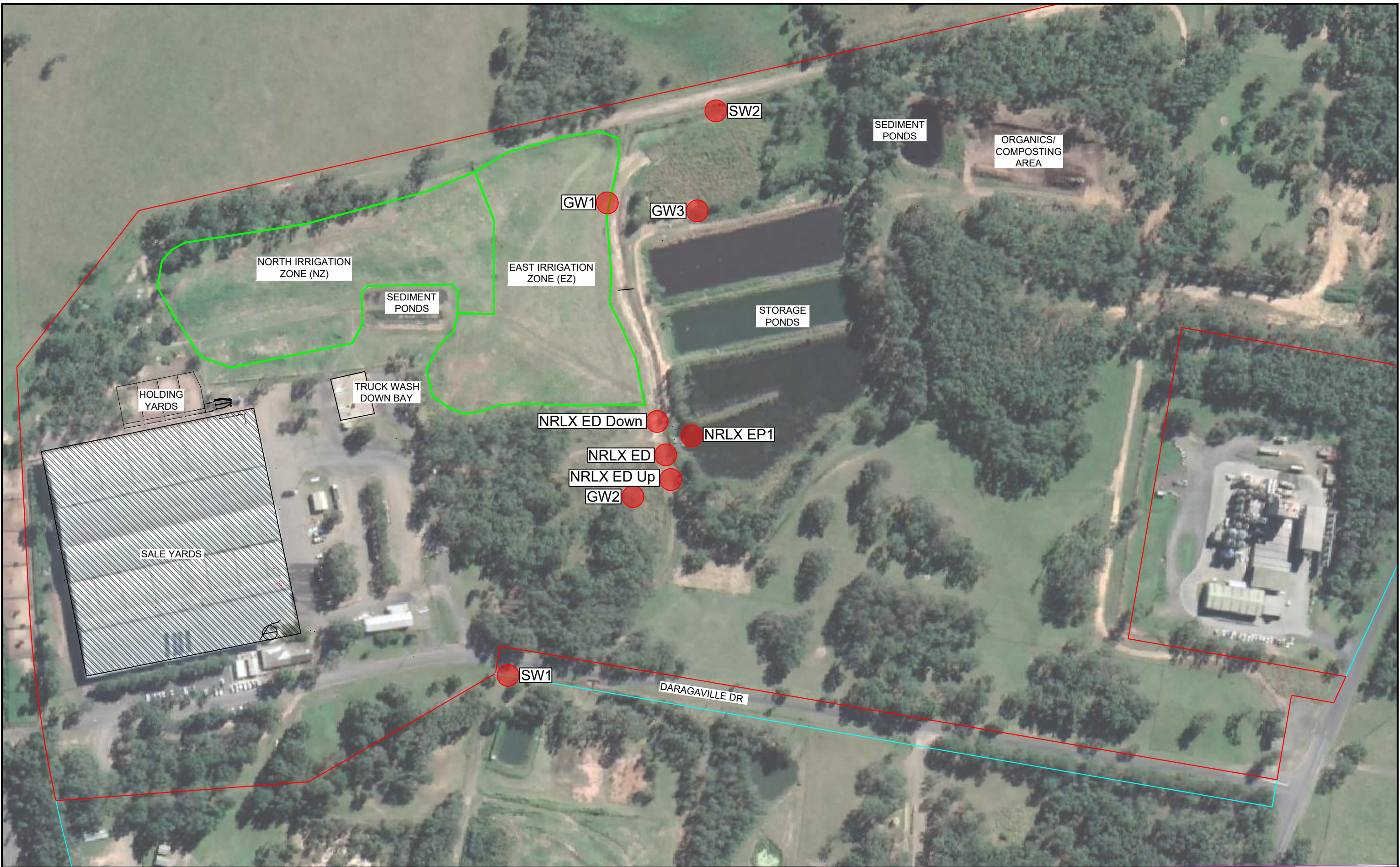
* Additional analysis run undertaken as full suite not collected on 18/03/2021
Bold and shaded cell denotes outside WQO value range

Attachment 5 Historic monitoring results for SW1 trigger event

Date	pH	EC	TDS	Ammonia (as N)	(BOD-5 Day)	Chlorophyll a	Dissolved Organic Carbon	Nitrate & Nitrite (as N)	Nitrate (as N)	Nitrite (as N)	Total Kjeldahl Nitrogen (as N)	TN	TP	Phosphate	Suspended Solids	Thermotolerant Coliforms
		uS/cm	(mg/L)	(mg/L)		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	cfu/100ml
15/12/2020	6.45	143	97	0.028	1.70	0.004	22.8		1.18	4.18	1.17	2.37	0.12	0.064	1	650
21/12/2020	7.33	704	479	0.32	2.00	0.027	35.8		5.161	0.11	0.87	6.14	0.19	0.094	6	3900
30/12/2020	7.01	242	165	0.024	2.60	0.009	39.8		0.136	0.021	1.75	1.91	0.18	0.055	12	3600
18/01/2021	6.96	126	86	0.067	5.80	0.017	18.7		0.567	0.028	1.2	1.8	0.37	0.243	95	13600
20/02/2021	7.26	257	175	0.428	3.60	0.01	29.9		4.719	0.125	3.72	8.57	0.18	0.071	27	4300
1/12/2021	7.36	248	169	0.122	1.70	0.011	14.3	1.239	1.195	0.044	1.31	2.55	0.41	0.062	48	12000
3/02/2022	7.07	0.193	131	0.340	3.7	0.021	17.2	0.442	0.370	0.072	1.59	2.03	0.263	0.044	55	128,000
24/02/2022	7.19	0.15	102	0.221	3.5	0.014	16.9	0.734	0.67	0.064	1.45	2.18	0.3	0.082	59	16000

Attachment 6 Historic monitoring results for SW2 trigger event

Date	pH	EC	TDS	Ammonia (as N)	(BOD-5 Day)	Chlorophyll a	Dissolved Organic Carbon	Nitrate & Nitrite (as N)	Nitrate (as N)	Nitrite (as N)	Total Kjeldahl Nitrogen (as N)	TN	TP	Phosphate	Suspended Solids	Thermotolerant Coliforms
		uS/cm	(mg/L)	(mg/L)		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	cfu/100ml
15/12/2020	7	284	193	0.117	4.8	0.005	19.8		4.18	0.099	1.28	5.56	0.32	0.174	15	520
21/12/2020	7.47	487	331	0.101	1.4	0.027	52.4		0.183	0.026	3.52	3.73	2.01	1.589	13	5200
30/12/2020	7.25	243	165	0.024	2.6	0.009	39.8		0.136	0.021	1.75	1.91	0.18	0.055	12	3600
18/01/2021	6.77	101	69	0.1	5.2	0.022	17.3		0.323	0.026	1.22	1.57	0.39	0.17	86	9000
20/02/2021	6.87	591	402	0.125	2.4	0.004	22.2		0.617	0.091	1.84	2.54	0.2	0.077	8	2900
1/12/2021	7.18	140	95	0.059	2	0.012	11.6	0.592	0.564	0.028	1.13	1.72	0.28	0.12	43	23000
3/02/2022	7.00	0.135	92	0.111	3.8	0.024	25.1	0.219	0.178	0.041	1.66	1.88	0.296	0.095	65	84,000
24/02/2022	7.07	0.127	86	0.211	4.2	0.021	13.3	0.294	0.029	0.265	1.34	1.63	0.3	0.23	53	21000




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CLIENT:



Richmond Valley Council




NRLX

REV.	ISSUE / AMENDMENTS	DATE
A	FIGURE ONLY	08/05/2021

DESIGNED JM
 DRAWN JM
 CHECKED MB

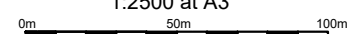
Survey: Newton Denny Chapelle (2017)
 Aerial imagery: Google Earth (2021)



PROJECT

NRLX
 ENVIRONMENTAL MONITORING

SCALE 1:2500 at A3



DRAWING

FIGURE 1-2
 MONITORING LOCATIONS

DRAWING CREATED 10/12/2020

DWG No.
 1-201335_NRLX_EnvMon_01

CAD FILE No.
 1-201335_NRLX_EIMP

REV. **A**

RESULTS OF WATER ANALYSIS

3 samples supplied by Australian Wetlands Consulting Pty Ltd on 28/03/2024. Lab Job No. R2399.

Samples submitted by Jesse Munro. Your Job: RVC Landfill- NRLX-GW1, NRLX-GW2, NRLX-GW3

8 George Street BANGALOW NSW 2479

Parameter	Methods reference	Sample 1 NRLX-GW1	Sample 2 NRLX-GW2	Sample 3 NRLX-GW3
	<i>Job No.</i>	<i>R2399/1</i>	<i>R2399/2</i>	<i>R2399/3</i>
pH	APHA 4500-H ⁺ -B	6.33	6.14	6.73
Conductivity (EC) (dS/m)	APHA 2510-B	5.23	4.23	4.21
Total Dissolved Salts (mg/L)	** Calculation using EC x 680	3,557	2,878	2,860
Total Dissolved Solids (mg/L)	** APHA 2540C - Evaporation of filtrate	1,033	3,396	1,752
Total Suspended Solids (mg/L)	GFC equiv. filter - APHA 2540-D	1,834	468	410
Total Phosphorus (mg/L P)	In house method W4	1.80	0.37	0.43
Phosphate (mg/L P)	APHA 4500 P-G	0.062	<0.005	0.016
Total Nitrogen (mg/L N)	In house method W4	4.37	0.01	<0.01
Nitrate (mg/L N)	APHA 4500 NO ₃ ⁻ -F	0.064	0.012	<0.005
Nitrite (mg/L N)	APHA 4500 NO ₂ ⁻ -I	0.055	<0.005	<0.005
Ammonia (mg/L N)	APHA 4500 NH ₃ -H	0.071	<0.005	<0.005
Sodium (mg/L)	APHA 3125 ICPMS ^{note 1&2}	120	868	673
Potassium (mg/L)	APHA 3125 ICPMS ^{note 1&2}	11.2	0.916	1.40
Calcium (mg/L)	APHA 3125 ICPMS ^{note 1&2}	8.15	30.2	73.2
Magnesium (mg/L)	APHA 3125 ICPMS ^{note 1&2}	7.41	75.1	64.5
Sodium Absorption Ratio (SAR)	** By calculation	7.31	19.2	13.8
Chloride (mg/L)	APHA 3125 ICPMS ^{note 1&2}	125	1,538	1,048
Sulfate (mg/L SO ₄ ²⁻)	APHA 3125 ICPMS ^{note 1&2}	24	18	41
Chloride/Sulfate Ratio	** Calculation	5.3	83.5	25.8
Dissolved Organic Carbon (mg/L)	APHA 5310-B	59.9	1.6	0.9

Notes:

- 1 mg/L (milligram per litre) = 1 ppm (part per million) = 1000 µg/L (micrograms per litre) = 1000 ppb (part per billion).
- For conductivity 1 dS/m = 1 mS/cm = 1000 µS/cm.
- Analysis performed according to APHA (2017) 'Standard Methods for the Examination of Water & Wastewater', 23rd Edition, except where stated otherwise.
- Analysis conducted between sample arrival date and reporting date.
- ** NATA accreditation does not cover the performance of this service.
- .. Denotes not requested.
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- Results relate only to the samples tested.
- This report was issued on 5/04/2024.



RESULTS OF EFFLUENT ANALYSIS

1 sample supplied by Australian Wetlands Consulting Pty Ltd on 28/03/2024. Lab Job No. R2401.

Samples submitted by Jesse Munro. Your Job: RVC Landfill- NRLX-EPA1.

8 George Street BANGALOW NSW 2479

Parameter	Methods reference	Sample 1 NRLX-EPA1
	Job No.	R2401/1
pH	APHA 4500-H ⁺ -B	8.69
Conductivity (EC) (dS/m)	APHA 2510-B	1.33
Total Dissolved Salts (mg/L)	** Calculation using EC x 680	907
Total Dissolved Solids (mg/L)	** APHA 2540C - Evaporation of filtrate	913
Total Suspended Solids (mg/L)	GFC equiv. filter - APHA 2540-D	145
Total Alkalinity (mg/L CaCO ₃ equivalent)	** Total Alkalinity - APHA 2320	399
Carbonate (mg/L CaCO ₃ equivalent)	** Residual Alkalinity - APHA 2320	305
Total Phosphorus (mg/L P)	In house method W4	2.44
Phosphate (mg/L P)	APHA 4500 P-G	2.02
Total Nitrogen (mg/L N)	In house method W4	7.70
Nitrate (mg/L N)	APHA 4500 NO ₃ ⁻ -F	0.015
Nitrite (mg/L N)	APHA 4500 NO ₂ ⁻ -I	0.015
Ammonia (mg/L N)	APHA 4500 NH ₃ -H	0.174
Hexavalent Chromium VI (mg/L)	**subcontracted: SGS report SE 263343	<0.004
Sodium (mg/L)	APHA 3125 ICPMS ^{note 1&2}	127
Potassium (mg/L)	APHA 3125 ICPMS ^{note 1&2}	160
Calcium (mg/L)	APHA 3125 ICPMS ^{note 1&2}	25.4
Magnesium (mg/L)	APHA 3125 ICPMS ^{note 1&2}	19.9
Sodium Absorption Ratio (SAR)	** By calculation	4.6
Chloride (mg/L)	APHA 3125 ICPMS ^{note 1&2}	170
Sulfate (mg/L SO ₄ ²⁻)	APHA 3125 ICPMS ^{note 1&2}	11
Chloride/Sulfate Ratio	** Calculation	15
Thermotolerant Faecal Coliforms (cfu/100 ml)	** APHA 9222-D	6,700
Aluminium (mg/L)	Total Available - APHA 3125 ICPMS ^{note 1&2}	0.223
Arsenic (mg/L)	Total Available - APHA 3125 ICPMS ^{note 1&2}	0.006
Cadmium (mg/L)	Total Available - APHA 3125 ICPMS ^{note 1&2}	<0.001
Chromium (mg/L)	Total Available - APHA 3125 ICPMS ^{note 1&2}	<0.001
Copper (mg/L)	Total Available - APHA 3125 ICPMS ^{note 1&2}	<0.001
Iron (mg/L)	Total Available - APHA 3125 ICPMS ^{note 1&2}	0.318
Manganese (mg/L)	Total Available - APHA 3125 ICPMS ^{note 1&2}	0.029
Nickel (mg/L)	Total Available - APHA 3125 ICPMS ^{note 1&2}	<0.001
Lead (mg/L)	Total Available - APHA 3125 ICPMS ^{note 1&2}	<0.001
Selenium (mg/L)	Total Available - APHA 3125 ICPMS ^{note 1&2}	<0.002
Zinc (mg/L)	Total Available - APHA 3125 ICPMS ^{note 1&2}	0.010
Mercury (mg/L)	Total Available - APHA 3125 ICPMS ^{note 1&2}	<0.0005
Beryllium (mg/L)	Total Available - APHA 3125 ICPMS ^{note 1&2}	<0.005
Cobalt (mg/L)	Total Available - APHA 3125 ICPMS ^{note 1&2}	<0.001
Lithium (mg/L)	Total Available - APHA 3125 ICPMS ^{note 1&2}	<0.001
Molybdenum (mg/L)	Total Available - APHA 3125 ICPMS ^{note 1&2}	0.001

Notes:

- Total metals - samples digested with nitric acid; Total available (acid soluble/ extractable) metals - samples acidified with nitric acid to pH <2;
Dissolved metals - samples filtered through 0.45µm cellulose acetate and then acidified with nitric acid prior to analysis
- Metals and salts analysed by Inductively Coupled Plasma - Mass Spectrometry (ICP-MS).
- 1 mg/L (milligram per litre) = 1 ppm (part per million) = 1000 µg/L (micrograms per litre) = 1000 ppb (part per billion).
- For conductivity 1 dS/m = 1 mS/cm = 1000 µS/cm.
- Analysis performed according to APHA (2017) 'Standard Methods for the Examination of Water & Wastewater', 23rd Edition, except where stated otherwise.
- Analysis conducted between sample arrival date and reporting date.
- ** NATA accreditation does not cover the performance of this service.
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- Results relate only to the samples tested.
- This report was re-issued on 12/04/2024. Hexavalent Cr added.



RESULTS OF WATER ANALYSIS

2 samples supplied by Australian Wetlands Consulting Pty Ltd on 28/03/2024. Lab Job No. R2398.

Samples submitted by Jesse Munro. Your Job: RVC Landfill NRLX-SW1 & NRLX-SW2

8 George Street BANGALOW NSW 2479

Parameter	Methods reference	Sample 1 NRLX-SW1	Sample 2 NRLX-SW2
	<i>Job No.</i>	<i>R2398/1</i>	<i>R2398/2</i>
pH	APHA 4500-H ⁺ -B	7.26	6.94
Conductivity (EC) (dS/m)	APHA 2510-B	0.297	0.204
Total Dissolved Salts (mg/L)	** Calculation using EC x 680	202	139
Total Dissolved Solids (mg/L)	** APHA 2540C - Evaporation of filtrate	265	204
Total Suspended Solids (mg/L)	GFC equiv. filter - APHA 2540-D	54	55
Biochemical Oxygen Demand ₅ (mg/L O ₂)	APHA 5210-B	2.6	3.2
Total Phosphorus (mg/L P)	In house method W4	0.302	0.296
Phosphate (mg/L P)	APHA 4500 P-G	0.100	0.109
Total Nitrogen (mg/L N)	In house method W4	2.43	1.30
Nitrate (mg/L N)	APHA 4500 NO ₃ ⁻ -F	1.51	0.137
Nitrite (mg/L N)	APHA 4500 NO ₂ ⁻ -I	0.036	0.018
Ammonia (mg/L N)	APHA 4500 NH ₃ -H	0.075	0.053
Faecal Coliforms (cfu/100 ml)	APHA 9222-D	1,900	13,000
Dissolved Organic Carbon (mg/L)	APHA 5310-B	17.6	17.4
Chlorophyll 'a' (mg/L)	** APHA 10200-H	0.005	0.011
Algal Biomass (mg/L)	** Inhouse	0.325	0.718

Notes:

- 1 mg/L (milligram per litre) = 1 ppm (part per million) = 1000 µg/L (micrograms per litre) = 1000 ppb (part per billion).
- For conductivity 1 dS/m = 1 mS/cm = 1000 µS/cm.
- Analysis performed according to APHA (2017) 'Standard Methods for the Examination of Water & Wastewater', 23rd Edition, except where stated otherwise.
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