Uralla Landfill

Location: Rowan Avenue, Uralla NSW 2358 Environment Protection Licence Number: 5899 Activities: Waste disposal to land and waste processing
The internet link to Licence No. 5899 is https://apps.epa.nsw.gov.au/prpoeoapp/ViewPOEOLicence.aspx?DOCID=112613&SYSUID=1&LICID=5899
Licensee under Protection of Environment Operations Act 1997 (POEO Act):
Uralla Shire Council, PO Box 106, Uralla NSW 2358

Council is required to monitor methane, groundwater, surface water and leachate at various sampling points. This document details recent results. To meet its obligation under Section 66 (6) of the POEO Act, a link to the current version of this document is available on Council's website.

On the following figure, sampling locations are given historical names and colour coded according to the type of monitoring: U = Uralla; S = Surface water; W = Well; L = Leachate. Corresponding Environment Protection Authority (EPA) Identification Numbers detailed on the Licence are provided below.

EPA No. 1
- US1 (surface water)

EPA No. 2
- EPL2 (leachate overflow)

EPA No. 3
-Leachate volume discharge to irrigation area

EPA No. 4
- UW1 (groundwater monitoring well)

EPA No. 5
- UW2 (groundwater monitoring well)

EPA No. 6
- UW3 (groundwater monitoring well)

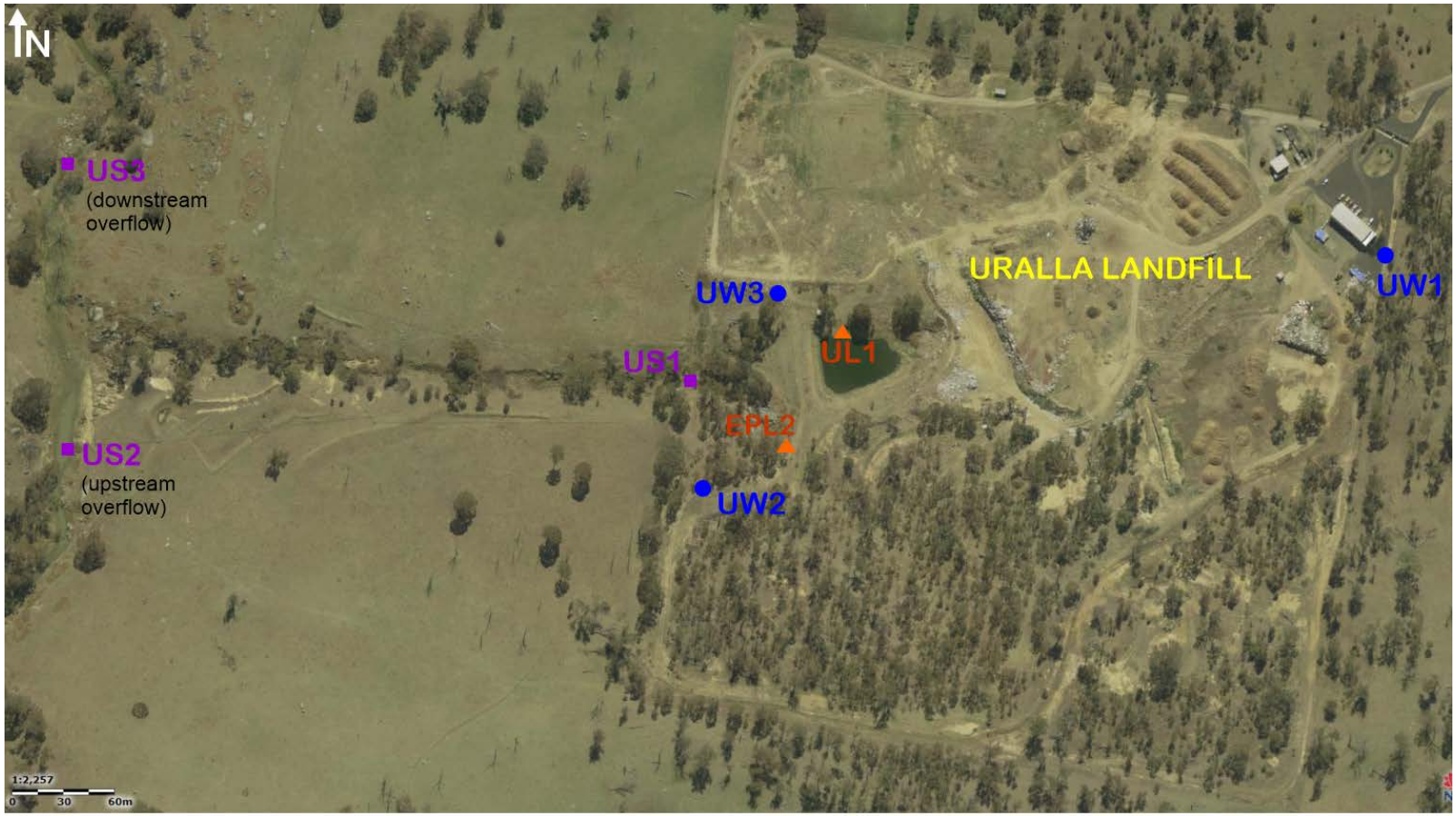
EPA No. 7
- UL1 (leachate quality)

EPA No. 8
- Surface methane

EPA No. 9
- Building methane

EPA No. 10
- US2 (surface water) Upstream leachate overflow sampling point

EPA No. 11
- US3 (surface water) Downstream leachate overflow sampling point



Base map: SIXNSW Department of Lands 2010

Monitoring results for the last four years are presented on following pages – as required in the EPA publishing requirements.

Water quality analytes are organised in the tables on following pages according to chemical grouping to assist chemical review. [Analytes are listed on the licence in alphabetical order.] They include analytes for groundwater, surface water and landfill leachate.

Tables are organised according to field and laboratory results. Field results start with the date the sampling and field tests were undertaken. Laboratory results tables start with the date the laboratory issued the results, followed by the date by which results were placed on the Uralla Shire Council website.

Abbreviations in the tables are provided here in alphabetical order:

Alk = Alkalinity measured as mg/L $CaCO_3$ equivalent; BTEX = Benzene, Toluene, Ethylbenzene, Xylene; Ca = Calcium; Cl = Chloride; D = Depth to water from top of internal well PVC casing; DO = Dissolved Oxygen; EC = Electrical Conductivity also called conductivity; Eh = Redox Potential; Fe = Iron; K = Potassium; Mg = Magnesium; Mn = Manganese; Na = Sodium; ND = Nil detected; NH_3 = Ammonia as a measure of ammonium ions; NO_x = Nitrite + Nitrate; NR = not required by licence; OC&OP = Organochlorine & Organophosphorus pesticides; RL = water level converted to Reduced Level relative to mean sea level; SO_4 = Sulphate; SS = Total suspended solids; Temp = Temperature; TKN = Total Kjeldahl Nitrogen (organic nitrogen + ammonia); TN = Total Nitrogen; TOC = Total Organic Carbon; TP = Total Phosphorus; VFR = Volumetric Flow Rate; VOCs = Volatile Organic Compounds; Zn = Zinc.

Measures:

mg/L = milligram per litre (equivalent to ppm); µS/cm = micro Siemens per centimetre; mV = millivolts; ºC= degrees Celsius; kL = kilolitres; ppm = parts per million.

Choice of water quality analytes:

Some analytes are tested because they give a general understanding of groundwater, surface water and leachate quality. Often the concentrations are greater in leachate than in groundwater and surface water. A simple comparison can tell us if landfill leachate may have escaped into groundwater or surface water. However, care is needed when reviewing these general results so that false conclusions are not made. The salt levels in groundwater are a case in point. EC is an indicator of salt levels. If the EC has previously been low, and then becomes at least three to four times higher, one would assume it is due to landfill leachate ingress into groundwater. The Uralla Landfill groundwater has relatively low EC (Table 1). An example of EC increase/decrease is found in the UW3 historical results. Its high was 3,433 µS/cm in Year 2001 and as its nitrogen compound contamination decreased, its EC decreased too, the lowest being 1,058 µS/cm in Year 2009. So landfill leachate intrusion may be indicated if the EC becomes higher again with corresponding increase in other contaminants such as nitrogen compounds. (It is likely that well UW3 was contaminated by nitrogen compounds emanating from old night soil trenches that are upgradient from the well.)

Other analytes give us more specific information about the possible presence of landfill leachate in groundwater and surface water. Even with these we must carefully consider if their increased concentrations are definitely due to landfill leachate and are not from some other source.

- Nitrogen compounds indicate biodegradation of the plant and animal waste in our solid waste. They may also be due to fertilizer use on nearby properties or old night soil trenches. A general rule of thumb is that total nitrogen (TKN + NO_x) should be <5 mg/L.
- Iron and manganese above 10 mg/L is an indicator that landfill leachate may be present in groundwater. However, these groundwater analytes may increase due to leaching of iron and manganese from the soil after excessive rainfall or flood water infiltration.
- Organic analytes such as BTEX compounds and VOCs are most likely to indicate landfill leachate, especially if they haven't been detected before.

So it is important to monitor on a regular basis to note any changes in water quality analyte concentrations and to judicially review the results. Increases in groundwater and surface water analyte concentrations due to landfill leachate intrusion are often at least three to four times the previous concentrations.

Comments on water quality results: Well UW3 is the only groundwater well or surface water sampling point of note – and its nitrogen compound concentrations have decreased.

Table 1: Groundwater quality & depth

	Frequency required by licence	DO	EC	pH	Eh	Temp	D	RL	Alk	Free CO_2
Measure		mg/L	µS/cm	1-14	mV	ºC	m	m	mg/L	mg/L
UW1	6 mthly →						3mthly	3mthly		
05/10/16		4.72	1676	6.50	+122	16.0	19.43	83.68	253	88
16/01/17		NR	NR	NR	NR	NR	19.36	83.75	NR	NR
13/05/17		4.26	1774	6.41	+118	17.2	19.26	83.85	240	103
29/07/17		NR	NR	NR	NR	NR	19.20	83.91	NR	NR
01/10/17		8.70	1749	6.92	+102	16.7	19.20	83.91	253	91
19/01/18		NR	NR	NR	NR	NR	19.11	84.00	NR	NR
11/07/18		5.43	1762	7.63	+119	16.3	19.03	84.08	227	123
09/09/18		NR	NR	NR	NR	NR	19.02	84.09	NR	NR
14/10/18		3.60	1691	6.95	+208	18.4	19.01	84.10	250	117
05/01/19		NR	NR	NR	NR	NR	18.97	84.14	NR	NR
13/04/19		6.62	1785	6.84	+167	20.0	18.96	84.15	270	88
14/08/19		NR	NR	NR	NR	NR	19.01	84.10	NR	NR
05/10/19		10.38	1793	7.36	+194	18.3	18.92	84.19	267	41
15/02/20		NR	NR	NR	NR	NR	18.88	84.23	NR	NR
17/06/20		2.75	1699	6.90	+143	18.3	18.98	84.13	267	117
03/09/20		NR	NR	NR	NR	NR	18.95	84.16	NR	NR
16/10/20		3.18	1695	6.84	+179	20.7	18.91	84.20	283	109
UW2	6 mthly →						3mthly	3mthly		
05/10/16		4.66	1570	7.14	+103	15.0	9.71	78.15	620	133
16/01/17		NR	NR	NR	NR	NR	9.60	78.26	NR	NR
13/05/17		1.33	1660	6.48	+129	15.9	9.50	78.36	607	147
29/07/17		NR	NR	NR	NR	NR	9.45	78.41	NR	NR
01/10/17		3.65	1641	6.52	+202	15.4	9.47	78.39	631	150
19/01/18		NR	NR	NR	NR	NR	9.43	78.43	NR	NR
11/07/18		0.52	1721	7.07	+79	15.6	9.55	78.31	647	164
09/09/18		NR	NR	NR	NR	NR	9.56	78.30	NR	S
14/10/18		0.66	1717	6.81	+169	15.6	9.57	78.29	653	182
05/01/19		NR	NR	NR	NR	NR	9.56	78.30	NR	NR
13/04/19		0.62	1705	7.05	+132	17.1	9.65	78.21	660	179
14/08/19		NR	NR	NR	NR	NR	9.72	78.14	NR	NR
05/10/19		3.64	1772	7.06	+158	16.9	9.73	78.13	667	147
15/02/20		NR	NR	NR	NR	NR	9.76	78.10	NR	NR
17/06/20		0.43	1681	7.21	+105	16.2	9.71	78.15	653	153
03/09/20		NR	NR	NR	NR	NR	9.65	78.21	NR	NR
16/10/20		0.24	1689	7.02	+174	18.1	9.60	78.26	707	158

Received from laboratory	Accessible on Council website by	Cl	As	Mn	Fe	NO_x	TKN	TN	TOC
		mg/L	mg/L	mg/L	mg/L	mg/L as N	mg/L as N	mg/L	mg/L
UW1		NR	NR	NR	NR	NR	NR	NR	NR
	31/10/16								
	14/02/17								
	12/06/17								
	30/08/17								
	01/11/17								
	19/02/18								
	08/08/18								
	08/10/18								
	09/11/18								
	12/02/19								
	16/05/19								
	12/09/19								
	05/11/19								
	17/03/20								
	14/07/20								
	02/10/20								
	16/11/20								
UW2									
12/10/16	31/10/16	160	0.006	0.060	0.18	0.14	0.8	0.9	16
	14/02/17	NR	NR	NR	NR	NR	NR	NR	NR
23/05/17	12/06/17	172	0.004	0.058	0.08	0.06	0.8	0.9	14
	30/08/17	NR	NR	NR	NR	NR	NR	NR	NR
13/10/17	01/11/17	22	202	0.004	0.076	0.04	1.0	1.0	18
	19/02/18	NR	NR	NR	NR	NR	NR	NR	NR
19/07/18	08/08/18	223	0.005	0.064	<0.05	0.04	0.8	0.8	22
	08/10/18	NR	NR	NR	NR	NR	NR	NR	NR
22/10/18	09/11/18	201	0.005	0.103	0.20	0.07	0.9	1.0	11
	12/02/19	NR	NR	NR	NR	NR	NR	NR	NR
26/04/19	16/05/19	201	0.005	0.057	0.06	0.03	0.8	0.8	9
	12/09/19	NR	NR	NR	NR	NR	NR	NR	NR
16/10/19	05/11/19	226	0.004	0.048	<0.05	0.02	1.1	1.1	17
	17/03/20	NR	NR	NR	NR	NR	NR	NR	NR
24/06/20	14/07/20	224	0.006	0.044	<0.05	0.03	0.8	0.8	9
	02/10/20	NR	NR	NR	NR	NR	NR	NR	NR
26/10/20	16/11/20	232	0.006	0.054	0.05	0.02	1.0	1.0	15

Table 1 continued: Groundwater quality & depth

	Frequency required by licence	DO	EC	pH	Eh	Temp	D	RL	Alk	Free CO_2
Measure		mg/L	µS/cm	1-14	mV	ºC	m	m	mg/L	mg/L
UW3	3 monthly									
05/10/16		0.66	1920	6.46	+135	14.8	9.68	80.95	480	264
16/01/17		0.35	1831	6.49	+142	17.2	9.53	81.10	507	320
13/05/17		0.45	1843	6.25	+151	15.6	9.43	81.20	460	308
29/07/17		0.52	1919	6.43	+172	15.8	9.27	81.36	469	337
01/10/17		0.29	1927	6.37	+133	15.0	9.22	81.41	519	367
19/01/18		0.48	2009	6.32	+107	19.1	9.14	81.49	513	279
11/07/18		0.72	1945	6.73	+96	14.8	9.21	81.42	547	425
09/09/18		0.26	2002	6.85	+114	15.7	9.30	81.33	567	411
14/10/18		0.24	1980	6.43	+185	15.9	9.37	81.26	560	431
05/01/19		0.19	2072	6.51	+139	18.0	9.28	81.35	560	387
13/04/19		0.95	2160	6.47	+136	16.9	9.62	81.01	553	405
14/08/19		0.95	2156	6.25	+125	15.7	9.82	80.81	580	513
05/10/19		0.88	2140	6.38	+191	16.7	9.81	80.82	613	455
15/02/20		0.57	2213	6.34	+171	17.9	9.96	80.67	680	469
17/06/20		0.26	2206	6.61	+159	15.8	10.06	80.57	687	440
03/09/20		0.29	2230	6.40	+147	13.7	10.02	80.61	587	337
16/10/20		0.34	2189	6.39	+139	18.5	9.98	80.65	620	469

Received from laboratory	Accessible on Council website by	Cl	As	Mn	Fe	NO_x	TKN	TN	TOC
		mg/L	mg/L	mg/L	mg/L	mg/L as N	mg/L as N	mg/L	mg/L
UW3									
12/10/16	31/10/16	222	0.047	0.020	<0.05	11.7	1.5	13.2	7
24/01/17	14/02/16	246	0.056	0.017	<0.05	14.2	2.4	16.6	14
23/05/17	12/06/17	247	0.056	0.017	<0.05	13.5	1.6	15.1	14
10/08/17	30/08/17	252	0.057	0.017	<0.05	14.3	2.8	17.1	14
13/10/17	01/11/17	287	0.052	0.017	<0.05	15.9	2.7	18.6	5
30/01/18	19/02/18	110	0.047	0.016	<0.05	14.0	2.6	16.6	8
19/07/18	08/08/18	305	0.048	0.015	<0.05	16.2	2.6	18.8	29
17/09/18	08/10/18	302	0.051	0.017	<0.05	13.8	2.7	16.5	20
22/10/18	09/11/18	310	0.040	0.013	<0.05	13.3	3.1	16.4	22
17/01/19	12/02/19	314	0.052	0.017	<0.05	12.4	0.7	13.1	14
26/04/19	16/05/19	317	0.047	0.020	<0.05	12.3	2.1	14.4	20
23/08/19	12/09/19	348	0.049	0.017	<0.05	12.3	2.5	14.8	14
16/10/19	05/11/19	373	0.049	0.015	<0.05	12.2	2.9	15.1	13
26/02/20	17/03/20	378	0.053	0.019	<0.05	12.7	2.8	15.5	10
24/06/20	14/07/20	376	0.047	0.017	<0.05	11.2	1.0	12.2	25
14/09/20	02/10/20	365	0.052	0.019	<0.05	10.4	2.1	12.5	41
26/10/20	16/11/20	375	0.057	0.020	<0.05	9.14	2.0	11.1	14

Table 2: Surface water quality

	Frequency required by licence	DO	EC	pH	Eh	Temp	Alk
Measure		mg/L	µS/cm	1-14	mV	ºC	mg/L
US1	6 monthly						
03/06/16		0.93	1757	7.00	-130	12.0	557
16/01/17		1.62	689	6.91	-62	22.5	147
29/07/17		4.33	1781	7.01	-75	8.2	583
19/01/18		6.17	1695	6.72	-204	21.7	517
09/09/18		0.64	2102	6.64	-205	16.2	717
05/01/19	no flow						
13/04/19		1.51	2206	7.30	-141	17.7	1100
14/08/19		3.91	2164	7.05	-105	12.8	680
05/10/19	no flow						
15/02/20		3.03	2256	7.28	-71	23.0	533
03/09/20	no flow						
16/10/20		0.86	1966	7.28	-177	18.9	536

Received from laboratory	Accessible on Council website by	VFR	SS	SO_4	Cl	As	Cr	Cu	Zn	Mn	Fe	NO_x	TKN	TN	TP	TOC
		kL/ day	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L as N	mg/L as n	mg/L	mg/L	mg/L
US1																
13/06/16	01/07/16	0.40	122	<1	272	0.002	<0.001	<0.001	<0.005	3.67	19.7	0.01	2.4	2.4	0.43	20
24/01/17	14/02/17	0.58	34	10	64	0.002	<0.001	<0.001	<0.005	1.26	2.54	0.02	2.0	2.0	0.38	25
10/08/17	30/08/17	10.80	20	46	268	0.001	0.004	0.003	0.006	1.18	0.14	1.21	5.3	6.5	0.28	40
30/01/18	19/02/18	trace	14	9	259	0.003	0.001	0.001	0.007	1.98	0.07	0.03	3.9	3.9	0.15	44
17/09/18	08/10/18	trace	53	<1	315	0.004	0.001	0.002	<0.005	3.93	3.01	0.01	2.8	2.8	0.35	36
26/04/19	16/05/19	trace	44	9	411	0.003	0.001	0.002	0.021	3.88	12.2	<0.01	3.3	3.3	0.22	42
23/08/19	12/09/19	trace	33	<1	351	0.001	<0.001	<0.001	<0.005	3.38	11.5	<0.01	3.2	3.2	0.16	32
26/02/20	17/03/20	2.59	31	122	412	0.003	0.002	0.002	0.010	5.67	4.73	0.01	3.4	3.4	0.23	30
26/10/20	16/11/20	2.59	58	46	469	0.002	<0.001	0.001	0.010	2.00	2.46	<0.01	2.6	2.6	0.10	23

Table 3a: Leachate quality – concentrated (UL1), overflow (UL2) – field analytes, and laboratory analytes (a)

	Frequency required by licence	DO	EC	pH	Eh	Temp	Alk
Measure		mg/L	µS/cm	1-14	mV	ºC	mg/L
UL1	6 monthly						
19/03/16		1.46	5725	7.23	-112	19.9	2400
05/10/16		1.60	3010	8.36	+46	18.3	1700
13/05/17		1.09	5155	6.97	-169	18.6	2100
01/10/17		1.22	4605	6.81	-89	15.3	460
11/07/18		5.04	4825	7.10	-11	12.8	1840
14/10/18		9.24	2381	6.52	+114	15.6	660
13/04/19		2.96	3955	7.48	+78	15.7	1000
05/10/19		18.42	3425	9.69	+121	19.1	760
17/06/20		1.56	4275	7.35	-79	18.4	1933
16/10/20		6.60	2141	8.14	+157	24.1	867
UL2	overflow	NR			NR	NR	
23/08/16			2280	8.20			799
16/09/16			1890	7.89			653

Received from laboratory	Accessible on Council website by	VFR	SS	SO_4	Cl	Ca	Mg	Na	K	As	Cr	Cu	Pb	Zn	Mn	B	Fe
		kL/ day	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
UL1		NR	NR			NR	NR	NR	NR			NR					
01/04/16	21/04/16			<1	507					0.054	0.030	<0.001	<0.001	<0.005	1.02	1.16	12.5
12/10/16	31/10/16			32	193					0.012	0.040	0.034	0.012	0.429	2.20	0.72	6.37
23/05/17	12/06/17			<5	381					0.124	0.023	<0.001	<0.001	0.007	3.21	0.98	29.5
13/10/17	01/11/17			<1	416					0.078	0.016	<0.001	<0.001	0.010	2.56	0.86	22.3
19/07/18	08/08/18			<1	357					0.046	0.014	0.003	<0.001	0.009	0.903	0.92	15.6
22/10/18	09/11/18			26	385					0.011	0.004	0.005	<0.001	0.010	0.283	0.54	0.70
26/04/19	16/05/19			7	298					0.008	0.012	0.011	<0.001	0.034	1.060	0.89	0.52
16/10/19	05/11/19			12	718					0.035	0.006	0.008	0.003	0.026	0.185	0.86	1.64
24/06/20	14/07/20			<1	339					0.060	0.017	0.003	<0.001	0.013	1.780	0.88	16.9
26/10/20	16/11/20			73	254					0.002	0.003	0.015	<0.001	0.014	0.663	0.59	0.48
UL2													NR			NR	
30/08/16	31/10/16	11	26	129	233	81	35	160	98	0.006	0.028	0.033		0.087	1.17		1.61
27/09/16	31/10/16	11	45	107	161	98	37	161	100	0.007	0.027	0.026		0.103	1.28		2.25

Table 3b: Leachate quality – concentrated (UL1), overflow (UL2) – laboratory analytes (b)

Received from laboratory	Accessible on Council website by		NO_x	TKN	TN	TP	TOC	OC/OP	BTEX compounds and/or VOCs
		Measure	mg/L as N	mg/L as N	mg/L	mg/L	mg/L	mg/L	mg/L
UL1	Six monthly								VOCs required
01/04/16	21/04/16		0.73	273	274.0	0.52	90	ND	Benzene 0.003; Meta & para Xylene 0.003; Ortho-Xylene 0.003; 1.2.4-Trimethylbenzene 0.009; Chlorobenzene 0.007
12/10/16	31/10/16		0.73	92.6	93.3	3.88	171	ND	Toluene 0.018; 2—butanone (methyl ethyl ketone) – MEK 0.190
23/05/17	12/06/17		0.02	210.0	210.0	3.29	150	ND	Benzene 0.004; Meta & para Xylene 0.002; 1.2.4-Trimethylbenzene 0.008; Chlorobenzene 0.009
01/10/17	01/11/17		0.03	182	182.0	1.67	125	ND	Benzene 0.002; Chlorobenzene 0.006
19/07/18	08/08/18		5.17	188.0	193.0	1.78	47	ND	nil detected
22/10/18	09/11/18		0.63	14.9	15.5	0.51	72	ND	nil detected
13/04/19	16/05/19		27.80	141.0	169.0	0.23	84	ND	nil detected
16/10/19	05/11/19		<0.01	22.0	22.0	2.48	112	ND	nil detected
24/06/20	14/07/20		2.41	180.0	182.0	1.18	45	ND	Benzene 0.004; Chlorobenzene 0.011
26/10/20	16/11/20		4.41	24.8	29.2	0.06	13	ND	nil detected
EPL2	overflow							NR	BTEX only required
30/08/16	31/10/16		1.92	54.8	56.7	0.59	84		nil detected
27/09/16	31/10/16		<0.01	45.2	45.2	0.80	95		nil detected

Methane is a colourless, odourless gas that is flammable and explosive. It is generated approximately three months after the deposition of putrescible solid waste and once oxygen is depleted. Testing is conducted above ground surfaces to assure than none is escaping to air, and in buildings to assure against asphyxiation and explosion.

Comments on methane monitoring results: Methane is occasionally detected on covered areas of the landfill, but is remediated with soil cover, usually by the next day.

Table 5: Methane detections (surface or building)

	Frequency required by licence	Detection locations	Methane (CH_4) by volume in air	Methane (CH_4) by volume in air	Methane (CH_4) as % LEL (Lower Explosive Limit)	Accessible on Council website
Measure			ppm CH_4 in air	% CH_4 in air	% LEL	
	3 monthly					
19/03/16		Nil detected.				21/04/16
03/06/16		Nil detected.				01/07/16
05/10/16		Nil detected.				31/10/16
16/01/17		Nil detected.				14/02/17
13/05/17		Nil detected.				12/06/17
29/07/17		Nil detected.				30/08/17
01/10/17		Nil detected.				01/11/17
19/01/18		Nil detected.				19/02/18
11/07/18		Nil detected.				08/08/18
09/09/18		Nil detected.				08/10/18
14/10/18		Nil detected.				09/11/18
05/01/19		Nil detected.				12/02/19
13/04/19		Nil detected.				16/05/19
14/08/19		Nil detected.				12/09/19
05/10/19		Nil detected.				05/11/19
15/02/20		Nil detected.				17/03/20
17/06/20		Nil detected.				14/07/20
03/09/20		Nil detected.				02/10/20
16/10/20		Nil detected.				16/11/20

Note: 500 ppm CH_4 by volume in air = 0.05% CH_4 by volume in air = 1% LEL.

Table 6: Monthly rainfall (from daily rainfall)

Landfill rain gauge Daily rainfall summarised here as monthly rainfall (mm)	Year 2016	Accessible on Council website	Year 2017	Accessible on Council website	Year 2018	Accessible on Council website	Year 2019	Accessible on Council website	Year 2020	Accessible on Council website
January	60.0	21/04/16	145.0	12/06/17	27.5	19/02/18	26.0	16/05/19	133.5	14/07/20
February	0.0	21/04/16	116.5	12/06/17	54.0	08/08/18	15.0	16/05/19	180.5	14/07/20
March	30.0	21/04/16	144.5	12/06/17	21.4	08/08/18	66.5	16/05/19	91.5	14/07/20
April	15.0	01/07/16	36.0	12/06/17	25.0	08/08/18	29.5	12/09/19	45.0	14/07/20
May	63.0	01/07/16	49.0	30/08/17	8.0	08/08/18	39.1	12/09/19	47.0	14/07/20
June	181.0	31/10/16	30.5	30/08/17	10.7	08/08/18	17.1	12/09/19	57.2	14/07/20
July	32.0	31/10/16	21.0	30/08/17	44.2	08/10/18	19.0	12/09/19	60.9	02/10/20
August	117.5	31/10/16	18.0	01/11/17	12.0	08/10/18	4.5	12/09/19	51.5	02/02/20
September	156.5	31/10/16	6.0	01/11/17	42.0	08/10/18	7.0	05/11/19	40.0	16/11/20
October	84.0	14/02/17	94.0	19/02/18	57.0	09/11/18	23.0	17/03/20	130.0	16/11/20
November	9.0	14/02/17	86.5	19/02/18	73.0	12/02/19	13.5	17/03/20		
December	57.5	14/02/17	126.0	19/02/18	48.0	12/02/19	29.6	17/03/20		

(Note: Rain data from 19 Jan 2018 to 12 April 2018 from BOM station 056034 Dumaresq Street Uralla which is ~1 km from the Uralla Landfill.)

Table 7: Leachate volume irrigated

Monthly discharge to utilisation area	Year	2016	Accessible on Council website	Year	2017	Accessible on Council website	Year	2018	Accessible on Council website	Year	2019	Accessible on Council website	Year	2020	Accessible on Council website
Measure	hours	kL		hours	kL		hours	kL		hours	kL		hours	kL	
Pump at UL1 dam (EPA Point 7)															
January	0.0	0	21/04/16	312	1223	12/06/17	108 to 19/1	423	19/02/18	0	0	16/05/19	53.0	208	14/07/20
February	0.0	0	21/04/16	300	1176	12/06/17	0	0	08/08/18	0	0	16/05/19	74.5	292	14/07/20
March	0.0	0	21/04/16	325	1274	12/06/17	0	0	08/08/18	0	0	16/05/19	49.0	192	14/07/20
April	0.0	0	01/07/16	294	1152	12/06/17	0	0	08/08/18	0	0	12/09/19	152.3	597	14/07/20
May	0.0	0	01/07/16	306	1200	30/08/17	0	0	08/08/18	0	0	12/09/19	66.8	262	14/07/20
June	27.0	360	31/10/16	266	1043	30/08/17	0	0	08/08/18	0	0	12/09/19	35.0	137	14/07/20
July	42.5	167	31/10/16	264	1035	30/08/17	0	0	08/10/18	0	0	12/09/19	87.6	343	02/10/20
August	241	945	31/10/16	90	353	01/11/17	0	0	08/10/18	0	0	12/09/19	46.2	181	02/10/20
September	319	1250	31/10/16	192	753	01/11/17	0	0	08/10/18	0	0	05/11/19	31.4	123	16/11/20
October	312	1223	14/02/17	138	541	19/02/18	0	0	09/11/18	0	0	05/11/19	23.0	90	16/11/20
November	217	851	14/02/17	144	564	19/02/18	0	0	12/02/19	0	0	17/03/20			
December	318	1247	14/02/17	180	706	19/02/18	0	0	12/02/19	0	0	17/03/20			

(Note: Pump rate is 3.92 kL/hour.)