Armidale Sewage Treatment Plant (STP)

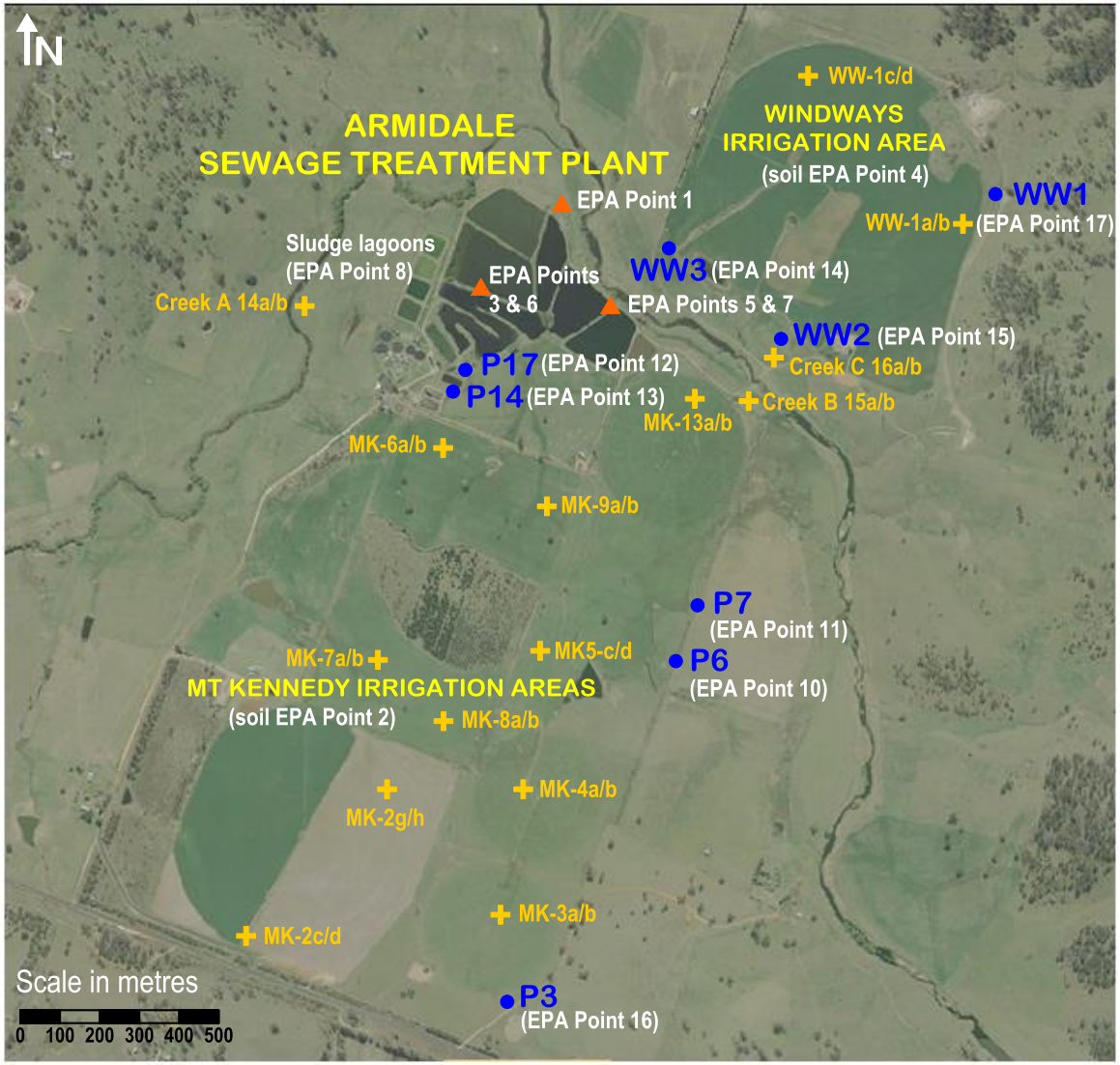
Location: 631 Cafferies Road, Armidale NSW 2350 Environment Protection Licence Number: 1722 Activities: Sewage treatment
Licensee under Protection of Environment Operations Act 1997 (POEO Act): Armidale Dumaresq Council, PO Box 75A, Armidale NSW 2350

The internet link to Licence No. 1722 is http://www.epa.nsw.gov.au/prpoeoapp/ViewPOEOLicence.aspx?DOCID=30769&SYSUID=1&LICID=1722

Council is required to monitor the volume and quality of outgoing treated wastewater (also called effluent). Up to 50% of the treated wastewater is used for irrigation on Council's surrounding cropping and grazing properties. Soils, biosolids, and groundwater are also tested to assist environmental management. 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.

The locations of sampling points are shown on the adjacent figure. Some historical names are used. P stands for piezometer; WW = Windways Well. Corresponding Environment Protection Authority (EPA) Identification Numbers detailed on the Licence are provided below.

EPA Point No. 1 (quality monitoring - discharge to Commissioners Waters)
EPA Point No. 2 (soils and mass monitoring on 'Mt Kennedy' & areas A & B irrigation fields)
EPA Point No. 3 (volume monitoring for 'Mt Kennedy' & areas A, B & C)
EPA Point No. 4 (soils & mass monitoring 'Windways' irrigation field)
EPA Point No. 5 (volume monitoring of discharge to 'Windways')
EPA Point No. 6 (quality monitoring of electric pump discharge to 'Mt Kennedy' & areas A, B & C)
EPA Point No. 7 (quality monitoring of diesel pump discharge to 'Windways' irrigation areas)
EPA Point No. 8 (volume monitoring sludge lagoons)
EPA Point No. 9 (Biosolids monitoring)
EPA Point No. 10 (P6 groundwater monitoring)
EPA Point No. 11 (P7 groundwater monitoring)
EPA Point No. 12 (P17 groundwater monitoring)
EPA Point No. 13 (P14 groundwater monitoring)
EPA Point No. 14 (WW3 groundwater monitoring)
EPA Point No. 15 (WW2 groundwater monitoring)
EPA Point No. 16 (P3 groundwater monitoring)
EPA Point No. 17 (WW1 groundwater monitoring)



Base map: Department of Lands 2010. Deep yellow sampling points – soil sample location examples 2012 & 2014.

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

The following tables provide results required by licence. Some additional results are also provided. Results are organised in their field and laboratory presentation order.

Abbreviations in the tables are provided here in alphabetical order:

BOD_5 = Biochemical Oxygen Demand over five days; Ca = Calcium; Cl = Chloride; EC = Electrical Conductivity also called conductivity; ESP = Exchangeable Sodium Percentage: Ex = Exchangeable; FC = Faecal Coliforms; K = Potassium; Na = Sodium; Mg = Magnesium; NH_3 = Ammonia as a measure of ammonium ions; M = Monthly; NO_3 = Nitrate; NO_x = Nitrite + Nitrate = Nitrogen Oxides; NC = Not continuing; NR = Not required; OM = Organic Matter; O&G = Oil and Grease; PSC = Phosphorus Sorption Capacity; S = Sulphur; SAR = Sodium Absorption Ratio; SRP = Soluble Reactive Phosphorus (also RP); TSS = Total suspended solids; TKN = Total Kjeldahl Nitrogen (organic nitrogen + ammonia); TN = Total Nitrogen; TP = Total Phosphorus; Q = Quarterly.

Measures:

CFU/100mL = Colony Forming Units/100mL; dS/cm = deciSiemens per centimetre; mg/kg = milligram/kilogram; mg/L = milligram per litre (equivalent to ppm); µS/cm = microSiemens per cm; < = less than, kL = kilolitres.

Limits:

90 percentile concentration - the monitoring results should not exceed the specified limit for 90% of the time, so for monthly tests, only 1 of the 12 results in the year should exceed the 90% concentration. These concentration limits apply to BOD, O&G, and TSS. For TN and TP, Council pays a fee based on the load (mass in the volume) discharged to Commissioners Waters.

Choice of water quality analytes:

Some analytes are tested because they give a general understanding of the discharge quality of treated effluent. For example, it is best that effluent used for irrigation or discharge to streams is not too salty. EC is an indicator of salt levels. It is best that EC be at least <1000 µS/cm. The pH range recommended for discharged effluent is pH 6.5 to 8.5, which is not too acidic or too alkaline to harm the bacteria breaking down the effluent, or the stream biota. Reasons for some other analytes are as follows:

- The BOD_5 test has traditionally been used by wastewater professionals to manage wastewater treatment processes. It is measured by the quantity of oxygen consumed by microorganisms during a five-day period, as a measure of the amount of biodegradable organic material in, or strength of, sewage. Sewage high in BOD can deplete oxygen in receiving waters, causing fish kills and ecosystem changes. A common standard is to treat sewage so that the BOD_5 of treated effluent is less than 20 mg/L (i.e. 20 mg of O_2 are consumed per litre of water over 5 days to break down the waste).
- The volume of sludge produced in a treatment plant is directly related to the TSS present in the sewage. The extent to which a treatment plant removes suspended solids (SS), as well as BOD_5, determines the efficiency of the treatment process. Suspended solids can smother stream biota. A common standard is to treat sewage so that the TSS of the treated effluent is less than 30 mg/L.
- Chloride and sodium are major elements of salt that can cause foliar injury during irrigation.
- SAR (Sodium Absorption Ratio) indicates if soil may be affected by sodicity, that is, the presence of a high proportion of sodium (Na+) ions relative to calcium (Ca2+) and magnesium (Mg2+) ions in soil or water. Sodicity degrades soil structure by breaking down clay aggregates. This makes the soil more erodible, less permeable to water, and reduces plant growth. In general, the higher the sodium adsorption ratio, the less suitable the water is for irrigation. Plants have ranges of SAR tolerance. Examples: citrus trees can tolerate SAR 2 to 8; oats SAR 18 to 46; and wheat, cotton and barley SAR 4 to 102.
- Increased levels of faecal coliforms (FC) warn of problems with the effluent treatment and possible contamination with pathogens. Raw sewage FC counts are in the millions. Note the low counts of the treated effluent in Table 1.
- Ammonia as ammonium ions can cause fish kills and affect other stream biota. While travelling through sewer pipes, the majority of the nitrogen contained in raw sewage is converted from organic-nitrogen to ammonium compounds.
- At the sewage treatment works, bacteria remove nitrogen compounds from the effluent by a two-step biological process. The first step is nitrification in which ammonium is converted to nitrate nitrogen in aerobic conditions (with air). (NO_x is usually predominantly nitrate.) The second step is denitrification in which nitrate is reduced to nitrogen gas (N_2) in anaerobic conditions (without air). So testing for the various nitrogen compounds alerts to any problems in the sewage treatment process.

- Total Phosphorus (TP) is a component of animal and plant matter in sewage. SRP represents the fraction of TP that is available to organisms for growth. If discharged into streams in high quantities, it may stimulate growth of photosynthetic organisms such as algae. The discharged phosphorus is diluted many times in Commissioners Waters.

Table 1a: Treated wastewater discharge quality – EPA Point No.1 – discharge to Commissioners Waters

EPA Point No. 1 – discharge to Commissioners Waters	Received from laboratory	Accessible on Council website by	BOD	TSS	O&G	pH	NH_3	NO_x	TKN	TN	SRP	TP	EC	FC	Na	Ca	K	Mg	SAR	Cl	Remarks
Measure			mg/L	mg/L	mg/L	1-14	mg/L as N	mg/L as N	mg/L as N	mg/L	mg/L	mg/L	µS/cm	CFU /mL	mg/L	mg/L	mg/L	mg/L	ratio	mg/L	
90 percentile concentration			20	30	10																
Frequency required by licence			M	M	M	M	M	M	M	M	M	M	M	M	NR	NR	NR	NR	NR	NR	
Sampling date																					
28/01/16	6/02/16	12/02/16	2.4	8	<5	8.31	1.52	2.39	3.4	5.80	6.16	6.41	639	300	63.7	29.5	18	18	2.3	55	
29/02/16	06/02/16	08/03/16	1.3	3	<5	9.41	.15	.552	4.6	5.2	2.34	2.43	600	30	72.2	25.3	19.9	19	2.6	55	
31/03/16	11/04/16	14/04/16	4.5	23	<5	7.82	5.15	.78	6.7	7.5	7.80	7.82	739	440	78.7	30	23.8	21.3	2.7	60	
29/04/16	04/05/16	14/05/16	.7	10	<5	8.58	5.7	4.84	.9	5.7	5.85	5.91	685	105	72.5	32.9	22	21.2	2.4	61	
31/05/16	9/06/16	14/06/16	1	3	<5	8.46	3.84	.672	16.6	17.3	6.53	6.59	748	50	74.1	27.8	23.3	19.9	2.6	62	
31/10/16	13/11/16	14/11/16	10.8	8	<5	7.56	10.6	1.33	14.3	15.6	3.65	3.75	661	610	58.8	27.7	15.6	16.6	2.2	46	
30/11/16	09/12/16	14/11/16	8.1	5	<5	8.51	3.56	.203	5.2	5.40	4.84	5.24	6.25	15	70.1	27.5	17.1	16.5	2.6	52	
28/12/16	05/01/16	10/01/16	1.1	10	<5	9.28	0.25	3.01	2.6	5.6	3.44	3.50	584	96	69.1	22.6	14.2	16.5	2.7	54	
31/01/17	12/02/17	16/02/17	6.9	20	<5	8.78	.63	0.075	5.5	5.60	4.88	601	631	200	72.9	23.4	20.8	17	2.8	59	
28/02/17	15/02/17	15/02/17	9	8.9	<5	8.77	0.47	1.28	6.1	7.4	3.72	5.64	619	110	72.2	26.2	18.0	18.2	2.7	58	
30/03/17	7/04/17	05/05/17	6.8	8	<5	7.80	1.73	4.66	5.8	10.5	3.93	3.96	476	60	53.2	27.8	13.8	14.4	2.0	36	
28/04/17	7/04/17	05/05/17	5	10	<5	7.81	6.64	4.21	6.5	10.7	4.15	4.20	652	10	69.8	33.0	17.3	18.0	2.4	54	
31/05/17	6/06/17	6/06/17	3	2.6	<5	7.80	16.4	7.22	9.2	16.4	4.49	4.59	771	25	71.3	28.5	18.1	16.2	2.6	55	
29/06/17	04/07/17	12/07/17	3.8	5	<5	7.66	10.0	8.02	11.6	19.6	4.16	4.40	691	5	57.1	27.5	15.7	15.7	2.2	50	
31/07/17	14/08/17	16/08/17	2.7	3	<5	7.80	11.2	10.5	7.9	18.4	4.14	4.57	739	<1	64.2	31.7	15.9	17.6	2.3	54	
31/08/17	07/09/17	11/09/17	3.2	8	<5	7.89	11.4	6.95	16.2	23.1	4.89	5.24	802	70	74.7	33.1	17.9	23.7	2.4	59	
28/09/17	05/10/17	11/10/17	2.9	13	<5	7.88	8.70	2.36	11.0	13.4	5.29	5.40	826	150	80	32.9	19	19.3	2.1	65	
31/10/17	08/11/17	09/11/17	5.6	10	<5	7.92	6.3	5.58	8.8	14.4	4.28	4.70	660	75	60.3	27.2	14.2	16.1	2.3	48	
30/11/17	7/11/17	11/12/17	5.5	10	<5	8.58	.55	2.07	12.3	14.4	4.88	5.12	676	210	74	28.1	17.1	18.3	2.7	58	
28/12/17	03/12/17	08/01/18	1.5	12	<5	9.35	.77	.795	.8	1.60	3.80	3.58	648	40	87.6	25.3	15.1	19.9	3.2	65	
31/01/18	07/02/18	08/02/18	2.8	5	<5	9.67	<0.2	0.116	1.4	1.5	1.22	1.41	600	5	96.0	19.4	14.2	4.9	5.1	75	
28/02/18	7/03/18	14/03/18	4.5	13	<5	8.08	3.36	0.215	5.1	5.3	7.99	8.78	752	90	94.1	30.7	21.3	19.8	3.3	71	
28/03/18	04/04/18	23/04/18	8.3	13	<5	7.93	5.47	0.479	6.9	7.4	10.3	10.2	772	190	84.7	37.7	21.6	23.2	2.7	72	
27/04/18	08/05/18	8/05/18	5.5	23	<5	8.07	1.97	0.836	3.5	4.30	8.52	8.75	784	45	87.3	36.7	21.2	24.2	2.7	69	
31/05/18	06/06/18	08/06/18	4.5	5	<5	7.80	11.4	8.83	8.3	17.1	4.98	5.42	758	20	81.6	33.9	21.0	23.2	2.6	66	
28/06/18	05/07/18	09/07/18	9.3	13	<5	8.40	8.92	7.52	10.4	17.9	4.78	4.80	766	35	79.6	32.5	22.6	23.9	2.6	62	
31/07/18	17/08/18	27/08/18	15.7	27	<5	8.30	10.6	2.01	18.3	20.3	3.75	4.03	778	65	75.3	29.6	18.6	21	2.6	57	
31/08/18	07/09/18	12/09/18	5.0	10	<5	7.74	14.8	4.85	16.3	21.1	4.67	4.97	804	5	72.7	32.2	21.1	23.9	2.4	65	
29/09/18	03/10/18	12/10/18	6.3	15	<5	7.94	12.2	4.46	14.9	19.4	6.43	8.88	767	15	69.6	34.6	21.0	21.8	2.3	57	
30/10/18	07/11/18	13/11/18	6.9	18	<5	7.78	10.1	4.05	12.1	16.1	4.45	4.65	694	65	66.8	31.5	17.5	22.2	2.2	48	

Table 1a continued: Treated wastewater discharge quality – EPA Point No.1 – discharge to Commissioners Waters

EPA Point No. 1 – discharge to Commissioners Waters	Received from laboratory	Accessible on Council website by	BOD	TSS	O&G	pH	NH_3	NO_x	TKN	TN	SRP	TP	EC	FC	Na	Ca	K	Mg	SAR	Cl	Remarks
Measure			mg/L	mg/L	mg/L		mg/L as N	mg/L as N	mg/L as N	mg/L	mg/L	mg/L	µS/cm	CFU/mL	mg/L	mg/L	mg/L	mg/L		mg/L	
90 percentile concentration			20	30	10																
Frequency required by licence			M	M	M	M	M	M	M	M	M	M	M	M	NR	NR	NR	NR	NR	NR	
Sampling date																					
30/11/18	08/12/18	14/12/18	6.0	15	<5	7.94	2.75	1.16	4.3	5.5	4.29	4.57	691	110	79.9	36.4	19.7	28.2	2.4	58	
31/12/18	07/01/19	08/01/19	2.1	58	<5	9.66	0.10	0.25	4.2	4.4	1.04	1.32	593	190	76.1	25.1	16.2	21.6	2.7	56	High algae
29/01/19	04/02/19	22/02/19	4.7	8	<5	8.96	0.45	0.38	6.6	7.0	3.02	3.27	6.37	50	80.4	23.5	20.6	17.6	3.1	71	
28/02/19	06/03/19	14/03/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No discharge over the weir
29/03/19	04/04/19	05/04/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No discharge over the weir
26/04/19	02/05/19	10/05/19	7.1	8	<5	8.04	3.94	1.54	3.6	5.1	6.98	7.02	914	120	88.4	44.1	25.8	30.4	2.5	85	
31/05/19	10/05/19	12/06/19	5.2	8	<5	8.11	4.14	5.85	4.0	9.9	5.20	5.72	873	40	96.3	43.8	27.1	31.4	2.7	85	
26/06/19	12/06/19	25/06/19	2.3	8	<5	7.69	3.21	2.30	17.4	19.7	4..25	4.78	480	54	90.9	38.9	25.5	28.3	2.7	76	
31/07/19	07/08/19	08/08/19	4.5	15	<5	7.91	12.2	3.56	18.9	22.2	5.20	5.58	917	20	92.9	40.2	26.0	28.5	2.7	79	
29/08/19	03/09/19	05/09/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No discharge over the weir
27/09/19	08/11/19	08/11/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No discharge over the weir
31/10/19	06/10/19	08/11/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No discharge over the weir
29/11/19	05/12/19	09/12/19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No discharge over the weir
30/12/19	05/01/20	07/01/20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No discharge over the weir
30/01/20	04/02/20	07/02/20	14.3	23	<5	8.91	3.33	2.20	8.5	10.7	4.83	4.92	646	900	86.0	31.3	25.9	24.4	2.8	65	
28/02/20	05/03/20	09/03/20	18	17.5	<5	8.56	2.61	4.84	6.76	11.6	3.63	4.17	639	340	62.7	39.4	17.3	21.3	2	53	
31/03/20	06/04/20	09/04/20	7.2	10	<5	8.00	11.2	2.06	13.6	15.7	7.14	7.57	813	13	97.4	42.4	24.1	28.2	2.8	71	
30/04/20	07/05/20	11/05/20	8.9	13	<5	7.95	12.8	1.75	16.3	18	6.62	8.02	841	40	74.1	41.9	22.5	23.1	2.3	65	
29/05/20	04/06/20	11/06/20	12.0	15	<5	7.95	15.4	8.48	15.3	23.8	6.05	6.10	897	10	86.0	38.8	24.7	23.8	2.7	71	
29/06/20	06/07/20	06/07/20	5.1	8	<2	8.10	17.9	9.3	16.4	25.7	5.54	6.21	926	5	89.8	38.5	23.8	27.0	2.7	74	
30/07/20	12/08/20	14/08/20	4.8	10	<2	8.23	20.8	8.08	21.4	29.5	5.86	6.4	960	180	89.3	37.8	25	27.4	2.7	70	
31/08/20	07/09/20	08/09/20	14.1	8	<2	7.89	15.3	8.2	18.7	26.9	5.54	5.68	771	<1	78.9	40	21.5	26.4	2.4	66	
30/09/20	07/10/20	19/10/20	8.4	13	<2	8.13	15.0	4.47	14.5	19.0	6.47	6.99	842	40	91.3	43.0	25.7	30.4	2.6	71	
29/10/20	04/11/20	6/10/20	5.1	20	<2	7.95	16.6	2.05	20.6	22.6	7.17	7.86	838	20	85.5	39.1	25.0	28.3	2.5	85	
27/11/20	04/12/20	8/12/20	14.3	50	<2	8.62	12.6	1.33	11.1	12.4	7.08	8.28	748	110	85.8	37.8	23.8	29.3	2.5	76	Weir discharge ceased. Pond stagnant.

Table 1b: Treated wastewater discharge quality – EPA Point No.6 – electric pump irrigation to Mt Kennedy

EPA Point No. 6 – electric pump irrigation to Mt Kennedy	Received from laboratory	Accessible on Council website by	BOD	TSS	O&G	pH	NH_3	NO_x	TKN	TN	SRP	TP	EC	FC	Na	Ca	K	Mg	SAR	Cl	Remarks
Measure			mg/L	mg/L	mg/L		mg/L as N	mg/L as N	mg/L as N	mg/L	mg/L	mg/L	µS/cm	CFU/mL	mg/L	mg/L	mg/L	mg/L		mg/L	
90 percentile concentration			20	30	10																
Frequency required by licence			M	M	M	M	NR	NR	NR	M	NR	M	M	M	Q	Q	Q	Q	Q	Q	
Sampling date																					
31/05/16	9/06/16	14/06/16	6.3	8	<5	7.88	12.7	10.5	19.5	29.7	6.25	6.26	833	900	71.5	29.2	22.2	19.6	2.5	58	
29/06/16	06/07/16	06/07/16	6.1	3	<5	7.68	9.39	9.55	13.1	22.6	4.30	4.61	688	440	62.1	30.3	18.4	17.9	2.2	51	
29/07/16	10/08/16	11/08/16	3.9	8	<5	7.95	10.4	10.	14.3	24.3	3.88	3.93	702	135	62.6	32.4	18.1	20.4	2.1	53	
31/08/16	09/09/16	14/09/16	4.8	10	<5	7.52	4.65	6.57	8.6	15.2	1.54	1.65	566	35	48.3	32.7	11.3	19	1.7	48	
30/09/16	11/10/16	12/10/16	15.5	5	<5	7.70	10.8	6.826	12.3	19.4	3.72	3.97	700	24	60.6	30.3	14.7	17.2	2.2	52	
31/10/16	13/11/16	14/11/16	9	3	<5	7.80	9.26	3.88	12.9	16.8	3.36	3.43	635	70	58.8	27.7	14.3	16.4	2.2	43	
30/11/16	09/12/16	14/11/16	19.1	33	<5	7.64	5.85	.842	9.8	10.6	4.60	5.52	665	5	73.1	26.8	18	16.6	2.7	53	
28/12/16	05/01/16	10/01/16	12.5	73	<5	8.34	2.38	5.57	3.6	9.2	3.76	4.01	594	80	61.9	24.2	17.5	15.8	2.4	50	High algal growth
31/01/17	12/02/17	16/02/17	10.5	44	<5	8.95	1.22	2.130	7.7	9.20	4.23	5.44	626	150	62.3	25.2	18.2	14.8	2.4	56	High algal growth
28/02/17	15/02/17	15/02/17	9.0	24	<5	9.10	0.28	0.55	9.0	9.6	3.33	4.36	626	235	77.2	25.1	18.9	18.6	2.8	52	
30/03/17	7/04/17	05/05/17	7.7	3	<5	7.63	3.30	4.72	7.5	12.2	3.84	3.85	503	290	54.1	28.7	13.4	14.8	2	37	
28/04/17	7/04/17	05/05/17	6.3	15	<5	7.82	6.93	7.54	3.8	11.3	4.75	4.84	694	185	73.1	31.8	18.3	18	2.6	56	
31/05/17	6/06/17	6/06/17	3	3.3	<5	7.66	20.0	9.13	10.9	20.0	4.69	4.83	729	340	70.1	27.6	17.5	15.8	2.6	55	
29/06/17	04/07/17	12/07/17	4.8	8	<5	7.58	11.6	9.92	13.6	23.4	4.67	4.77	915	190	61.0	28.4	16.2	16.2	2.3	52	
31/07/17	14/08/17	16/08/17	7.2	5	<5	7.77	12.3	9.40	10.9	20.3	4.35	4.80	758	65	68.3	31.1	16.2	17.6	2.4	54	
31/08/17	07/09/17	11/09/17	3.6	5	<5	7.81	4.34	5.17	7.4	12.6	4.02	6.22	724	100	71.4	32.5	16.6	23.5	2.3	60	
28/09/17	05/10/17	11/10/17	20	95	<5	8.61	11.8	3.33	19.2	22.5	6.09	6.79	811	525	78.1	29.4	18.8	17.8	2.8	65	High algal growth
31/10/17	08/11/17	09/11/17	6.9	10	<5	7.82	6.68	6.02	7.4	13.4	4.21	4.65	675	230	63.1	28.4	14.6	16.4	2.3	50	
30/11/17	7/11/17	11/12/17	9.6	8	<5	7.72	2.87	3.62	4.4	8.0	5.81	5.83	695	40	75.1	27.4	17.0	18.3	2.7	59	
28/12/17	03/12/17	08/01/18	11.9	120	<5	8.98	0.10	0.720	2.1	2.80	5.51	5.75	674	190	89.6	23.2	19.9	21.2	3.2	67	High algal growth
31/01/18	07/02/18	08/02/18	12.8	28	<5	8.40	.88	1.41	4.0	5.4	5.68	5.78	670	50	81.3	27.4	20.0	21.0	2.8	62	
28/02/18	7/03/18	14/03/18	8.6	13	<5	7.91	7.04	1.51	8.9	10.4	7.36	7.96	710	380	75.8	30.5	19.6	20.5	2.6	56	
28/03/18	04/04/18	23/04/18	15.9	15	<5	7.84	11.5	4.11	10.8	14.9	8.03	7.96	771	430	76.6	32.4	20.5	21.2	2.6	69	
27/04/18	08/05/18	8/05/18	7.2	30	<5	8.18	6.96	4.94	8.9	13.8	5.31	5.37	728	1200	74.1	2.6	19.5	20.9	2.6	58	
31/05/18	06/06/18	08/06/18	11.6	5	<5	7.59	11.3	7.0	13.1	20.1	5.64	5.75	786	240	82.2	31.1	21.6	22.9	2.7	63	
28/06/18	05/07/18	09/07/18	9.0	8	<5	7.74	15.1	8.83	15.7	24.5	5.43	5.47	814	100	79.7	31.8	22.4	27.1	2.5	63	
31/07/18	17/08/18	27/08/18	15.9	23	<5	8.17	3.06	2.10	15.5	17.6	4.47	4.86	834	400	79.3	31.7	20.4	22.2	2.6	63	
31/08/18	07/09/18	12/09/18	20	15	<5	7.71	18.0	7.06	22.2	29.3	5.61	5.83	833	550	71.9	32.9	21.7	24.2	2.3	64	
29/09/18	3/10/18	12/10/18	8.3	10	<5	7.78	14.2	7.98	18.6	26.6	4.49	5.26	776	480	66.7	34.7	20.3	21.8	2.2	57	
30/10/18	7/11/18	13/11/18	9.0	5	<5	7.68	9.3	5.41	12.1	17.5	4.0	4.11	698	60	67.6	30.8	17.2	21.9	2.3	50	

Table 1b continued: Treated wastewater discharge quality – EPA Point No.6 – electric pump irrigation to Mt Kennedy

EPA Point No. 6 – electric pump irrigation to Mt Kennedy	**Received** from laboratory	**Accessible** on Council website by	**BOD**	**TSS**	**O&G**	**pH**	**NH_3**	**NO_x**	**TKN**	**TN**	**SRP**	**TP**	**EC**	**FC**	**Na**	**Ca**	**K**	**Mg**	**SAR**	**Cl**	**Remarks**
Measure			mg/L	mg/L	mg/L		mg/L as N	mg/L as N	mg/L as N	mg/L	mg/L	mg/L	µS/cm	CFU/mL	mg/L	mg/L	mg/L	mg/L		mg/L	
90 percentile concentration			20	30	10																
Frequency required by licence			M	M	M	M	NR	NR	NR	M	NR	M	M	M	Q	Q	Q	Q	Q	Q	
30/11/18	8/12/18	14/12/18	11.0	18	<5	8.20	2.80	1.79	5.1	6.9	2.75	2.91	660	210	76.3	34	19.0	27.3	2.4	54	
31/12/18	7/01/19	8/01/19	15	60	<5	7.93	1.27	0.12	8.1	8.2	5.14	5.44	670	45	77.7	31.1	17.5	24.1	2.5	59	High algal growth
29/01/19		22/02/19	14.9	28	<5	8.05	2.91	2.69	8.4	11.1	5.87	6.16	739	200	81.4	31.4	22.1	24.1	2.7	69	
28/02/19	6/03/19	14/03/19	11.3	50	<5	8.38	5.0	1.40	10.9	12.3	6.98	7.65	813	380	88.8	33.0	88.8	24.4	2.9	74	No flow over weir. Algal growth.
29/03/19	4/04/19	05/04/19	13.1	53	<5	8.02	3.77	3.55	5.9	9.4	5.75	6.53	807	560	80.0	38.1	24.3	26.3	2.4	70	No flow over weir. Algal growth.
26/04/19	2/05/19	10/05/19	11.9	13	<5	7.30	6.19	3.34	6.0	9.3	5.27	5.37	789	280	77.4	36.2	22.9	25.4	2.4	74	
31/05/19	10/05/19	12/06/19	7.0	5	<5	7.92	9.45	8.98	5.5	14.5	5.11	5.74	851	147	92.1	38.3	25.6	28.8	2.7	77	
26/06/19	12/06/19	25/06/19	9.0	8	<5	7.57	11.6	3.28	27.2	30.5	4.41	4.71	933	1731	88.2	37.7	25.7	27.6	2.7	76	
31/07/19	7/08/19	8/08/19	9.2	10	<5	7.74	14.4	2.27	24.2	26.5	5.64	6.02	936	268	91.6	37.1	25.5	27.5	2.8	78	
29/08/19	3/09/19	5/09/19	8.0	15	<5	8.33	21.6	5.95	22.1	28.1	5.55	6.52	911	105	88.5	39.0	26.0	27.8	2.6	76	
27/09/19	08/11/19	8/11/19	3.0	18	<5	8.90	1.67	4.46	14.2	18.7	5.02	5.70	821	40	96.2	36.1	27.3	30.8	2.8	66	
31/10/19	6/10/19	8/11/19	15.5	55	<5	8.68	14.4	1.66	18.9	20.6	6.47	7.69	826	92	91.3	39.7	28.8	30.2	2.7	79	Weir discharge ceased. Pond stagnant.
29/11/19	05/12/19	9/12/19	8.4	90	<5	9.78	3.04	1.22	9.68	10.9	1.19	3.43	743	92	102	24.7	29.1	25.5	3.4	79	Weir discharge ceased. Pond stagnant.
30/12/19	05/01/20	7/01/20	6.6	53	<5	9.76	2.92	1.03	8.1	9.1	1.96	3.72	752	500	102.8	22.4	34.8	27.7	3.4	93	Weir discharge ceased. Pond stagnant.
30/01/20	04/02/20	07/02/20	9.5	10	<5	8.35	9.19	3.20	13.7	16.9	6.14	7.25	683	550	83.6	35.6	23.4	23.5	2.7	57	
28/02/20	05/03/20	09/03/20	18	20	<5	8.09	8.88	5.17	12.6	17.8	4.05	4.22	713	710	67.2	39.3	18.4	21.5	2.1	60	
31/03/20	6/04/20	09/04/20	6.8	15	<5	7.90	18.2	2.70	20.1	22.8	6.71	6.92	874	60	97.0	40.0	24.1	27.1	2.9	71	
30/04/20	7/05/20	11/05/20	8.55	20	<5	8.05	14.2	3.77	19.2	23	5.92	6.84	869	35	77.9	41.2	22.5	22.8	2.4	67	
29/05/20	04/06/20	11/06/20	9.2	13	<5	7.87	15.3	11.4	15.8	27.2	6.08	4.13	915	110	82.6	36.5	24.5	22.8	2.6	72	
29/06/20	06/07/20	06/07/20	6.1	10	<2	8.10	16.6	9.2	21.1	30.3	6.10	6.35	920	280	89.0	38.5	23.3	26.8	2.7	74	
30/07/20	12/08/20	14/08/20	4.7	10	<2	8.23	20.8	8.08	21.4	29.5	5.86	6.4	960	180	86.8	36.3	23.8	26.2	2.7	68	
31/08/20	07/09/20	08/09/20	8.6	3	<2	7.91	14.2	7.9	19.6	27.5	5.36	5.56	833	75	81	40.8	22	27	2.4	69	
30/09/20	7/10/20	19/10/20	7.2	17	<2	8.61	16.9	5.06	17.3	22.4	5.96	6.89	830	120	90.7	41.6	25.5	29.5	2.6	71	
29/10/20	4/11/20	6/10/20	7.8	13	<2	7.92	15.5	3.69	20.5	24.2	5.65	6.46	793	400	78.8	36.5	23.7	26.2	2.4	78	
27/11/20	04/12/20	8/12/20	11.0	30	<2	8.41	21.3	0.51	19.3	19.8	7.58	8.04	779	450	92.3	38.3	24.4	30.0	2.7	73	

Table 1c: Treated wastewater discharge quality – EPA Point No.7 – diesel pump irrigation to Windways

EPA Point No. 7 – diesel pump irrigation to Windways	**Received** from laboratory	**Accessible** on Council website by	**BOD**	**TSS**	**O&G**	**pH**	**NH_3**	**NO_x**	**TKN**	**TN**	**SRP**	**TP**	**EC**	**FC**	**Na**	**Ca**	**K**	**Mg**	**SAR**	**Cl**	**Remarks**
Measure			mg/L	mg/L	mg/L		mg/L as N	mg/L as N	mg/L as N	mg/L	mg/L	mg/L	µS/cm	CFU/mL	mg/L	mg/L	mg/L	mg/L		mg/L	
90 percentile concentration			20	30	10																
Frequency required by licence			M	M	M	M	NR	NR	NR	M	NR	M	M	M	Q	Q	Q	Q	Q	Q	
Sampling date																					
31/05/16	9/06/16	14/06/16	7.3	5	<5	7.70	12.9	10.6	21	31.6	6.79	6.91	780	1200	63.3	27.2	19.3	17.8	2.3	53	
29/06/16	06/07/16	06/07/16	2.2	5	<	7.72	5.84	5.09	8.5	13.6	5.05	5.32	720	710	75.8	31.6	20.1	19.8	2.6	64	
29/07/16	10/08/16	11/08/16	9	13	<5	7.7	5.58	6.69	7.4	14.1	4.21	4.62	718	765	72.4	32.7	19.5	21.4	2.4	62	
31/08/16	09/09/16	14/09/16	16.4	10	<5	7.60	7.43	8.17	11.4	19.6	1.70	1.83	634	410	54.9	33.6	13	20.8	1.8	55	
30/09/16	11/10/16	12/10/16	9.0	20	<5	8.39	5.8	10.2	7.5	17.7	3.14	3.55	626	100	56.5	29.8	13.9	16.4	2.1	55	
31/10/16	13/11/16	14/11/16	10.1	5	<5	7.57	10.5	8.20	11.9	20.1	3.03	3.19	665	215	60.3	28.4	14.4	16.7	2.2	46	
30/11/16	09/12/16	14/11/16	11.9	30	<5	8.56	5.75	4.63	6.6	11.2	2.83	3.52	650	230	71.2	24.5	16.7	16.2	2.7	56	
28/12/16	05/01/16	10/01/16	3.3	3	<5	9.37	0.97	2.15	2.6	4.8	1.89	2.11	585	32	68	22.4	15.4	16.9	2.6	59	
31/01/17	12/02/17	16/02/17	4.5	8	<5	8.32	1.30	.612	4.2	4.80	6.14	6.12	680	65	74.9	29.3	18.5	18.7	2.7	65	
28/02/17	15/02/17	15/02/17	17.3	60	<5	8.58	0.54	2.35	10.0	12.3	3.91	4.99	582	330	88.0	25.0	20.6	22.5	3.1	65	Algae
30/03/17	7/04/17	05/05/17	23.3	10	<5	8.14	2.60	3.37	7.9	11.3	4.41	4.44	565	1100	70.2	26.6	16.2	16.5	2.6	51	Algae
28/04/17	7/04/17	05/05/17	6.5	20	<5	8.07	1.22	1.09	2.3	3.1	6.76	6.98	624	65	74.6	30.6	17.9	18.8	2.6	59	
31/05/17	6/06/17	6/06/17	8	5.0	<5	7.60	23.7	12.7	11.0	23.7	4.80	4.89	708	1250	66.5	26.3	17.1	15.3	2.5	52	
29/06/17	04/07/17	12/07/17	7.1	8	<5	7.59	11.1	9.01	13.1	22.1	5.42	6.67	726	TNC	64	29.2	16.6	16.9	2.3	56	
31/07/17	14/08/17	16/08/17	9.9	8	<5	7.63	13.2	12.9	9.7	22.6	5.10	5.37	807	825	71.5	30.4	16.7	17.6	2.6	55	
31/08/17	07/09/17	11/09/17	6.2	5	<5	7.78	12.7	6.65	21.5	28.1	4.36	5.74	845	30	76.8	31.2	18.1	23.2	2.5	59	
28/09/17	05/10/17	11/10/17	5.4	13	<5	7.71	12.6	6.24	27.7	33.9	6.19	6.65	828	230	74.6	29.5	18.1	17.4	2.7	62	
31/10/17	08/11/17	09/11/17	5.0	5	<5	8.11	4.43	8.84	7.2	16.0	4.58	4.81	706	280	70.2	26.8	15.5	17.4	2.5	58	
30/11/17	7/11/17	11/12/17	5.5	10	<5	8.70	2.40	4.05	3.8	7.5	4.53	4.59	691	560	73.8	27	17.6	18.7	2.7	61	
28/12/17	03/12/17	08/01/18	6.8	8	<5	7.86	9.30	4.60	8.4	13.0	5.25	5.46	741	90	80.6	24.1	18.3	19.5	3.0	56	
31/01/18	07/02/18	08/02/18	21.9	35	<5	8.37	6.36	3.93	10.1	14.0	5.89	6.37	725	550	80.4	29.1	19.3	20.5	2.8	60	Algae
28/02/18	7/03/18	14/03/18	5.4	10	<5	7.98	4.77	0.210	6.9	7.1	8.70	9.02	750	800	88.1	31.3	20.1	22.2	2.9	66	
28/03/18	04/04/18	23/04/18	11.0	20	<5	7.72	12.2	6.27	16.3	22.6	6.98	6.57	791	630	75.2	29	21.0	20.5	2.6	62	
27/04/18	08/05/18	8/05/18	7.3	10	<5	7.85	10.1	7.33	12.0	19.3	5.98	6.25	759	1600	75.0	31.0	19.2	21.0	2.5	60	
31/05/18	06/06/18	08/06/18	6.2	5	<5	7.72	12.9	18.0	7.0	25.0	5.78	6.10	808	1150	81.9	31.8	20.4	22.7	2.7	62	
28/06/18	05/07/18	09/07/18	3.0	5	<5	7.89	3.37	5.52	4.0	9.5	5.18	5.26	776	100	86.3	34.2	21.3	24.6	2.7	71	
31/07/18	17/08/18	27/08/18	6.1	15	<5	7.81	6.74	1.92	14.7	16.6	3.57	4.56	780	1220	81.1	31.9	20.0	22.2	2.7	70	
31/08/18	07/09/18	12/09/18	11.7	8	<5	8.12	7.83	7.78	10.2	18	4.28	4.46	783	360	79.9	34.3	21.1	24.2	2.6	70	
29/09/18	3/10/18	12/10/18	5.0	8	<5	8.10	1.54	3.83	3.4	7.2	3.73	3.88	780	75	85.2	36.4	21.8	22.8	2.7	69	
30/10/18	7/11/18	13/11/18	4.9	5	<5	8.38	0.90	2.59	3.8	6.4	4.33	4.49	711	25	85.5	34.5	20.3	24.5	2.7	64	

Table 1c continued: Treated wastewater discharge quality – EPA Point No.7 – diesel pump irrigation to Windways

EPA Point No. 7 – diesel pump irrigation to Windways	**Received** from laboratory	**Accessible** on Council website by	**BOD**	**TSS**	**O&G**	**pH**	**NH_3**	**NO_x**	**TKN**	**TN**	**SRP**	**TP**	**EC**	**FC**	**Na**	**Ca**	**K**	**Mg**	**SAR**	**Cl**	**Remarks**
Measure			mg/L	mg/L	mg/L		mg/L as N	mg/L as N	mg/L as N	mg/L	mg/L	mg/L	µS/cm	CFU/mL	mg/L	mg/L	mg/L	mg/L		mg/L	
90 percentile concentration			20	30	10																
Frequency required by licence			M	M	M	M	NR	NR	NR	M	NR	M	M	M	Q	Q	Q	Q	Q	Q	
Sampling date																					
30/11/18	8/12/18	14/12/18	4.8	10	<5	7.92	2.02	1.35	2.6	3.9	4.81	5.67	722	80	91.9	37.1	22.1	28.7	2.8	68	
31/12/18	7/01/19	8/01/19	4.8	5	<5	7.85	8.15	0.34	13.7	14.0	5.19	5.33	768	310	73.1	31.5	20.9	24.4	2.4	63	
29/01/19	4/02/19	22/02/19	9.0	10	<5	7.82	8.36	1.63	14.7	16.3	5.86	6.14	754	440	75.3	31.0	20.3	22.3	2.5	62	
28/02/19	6/03/19	14/03/19	6.8	23	<5	7.89	12.5	3.04	19.1	22.1	5.32	5.40	836	1450	84.7	33.3	22.1	23.3	2.8	67	
29/03/19	4/04/19	05/04/19	4.5	5	<5	8.04	1.58	2.84	3.6	6.4	7.78	8.48	814	447	87.3	37.4	23.5	27.1	2.7	81	
26/04/19	2/05/19	10/05/19	3.3	2	<5	8.12	0.47	3.73	2.1	5.8	6.35	6.98	802	30	86.0	37.5	23.2	27.0	.2.6	679	
31/05/19	10/05/19	12/06/19	8.6	5	<5	7.84	11.2	14.6	9.5	24.1	6.03	6.60	933	1410	93.5	40.4	26.5	29.4	2.7	79	
26/06/19	12/06/19	25/06/19	11.6	18	<5	7.58	16.2	5.26	41.5	46.8	5.38	5.41	784	1200	88.2	41.9	26.9	28.6	2.6	79	
31/07/19	7/08/19	8/08/19	4.8	8	<5	7.89	2.27	0.60	6.3	6.9	3.18	3.81	846	100	98.8	38.9	23.7	28.2	2.9	70	
29/08/19	3/09/19	5/09/19	3.0	15	<5	9.28	0.9	2.29	27	5.0	2.43	2.72	777	10	97.9	37.3	23.7	27.9	3.0	86	
27/09/19	08/11/19	8/11/19	11.1	15	<5	7.67	18.8	8.72	24.6	13.3	4.77	5.56	919	440	85.6	36.7	25.0	28.9	2.6	66	
31/10/19	6/10/19	8/11/19	8.9	25	<5	9.20	0.86	1.32	4.48	5.8	3.71	3.84	744	40	104.8	31.0	26.8	29.4	3.2	90	
29/11/19	05/12/19	9/12/19	8.1	20	<5	8.90	3.10	0.84	5.56	6.4	4.65	4.98	771	40	709.8	29.6	26.7	28.0	3.5	101	
30/12/19	05/01/20	7/01/20	15.9	35	<5	8.59	11.8	4.36	7.0	11.4	7.84	7.9	817	360	96.1	36.6	31.8	29.6	2.9	80	Algae
30/01/20	04/02/20	07/02/20	15.6	15	<5	7.95	9.09	6.69	11.1	17.8	3.38	4.06	665	1400	81.5	35.3	20.1	21.8	2.7	53	
28/02/20	05/03/20	09/03/20	10.4	10	<5	7.86	11.0	7.05	14.1	21.1	4.06	4.24	732	1250	68.1	36.7	18.4	20.6	2.2	57	
31/03/20	6/04/20	09/04/20	7.8	10	<5	7.84	14.1	8.25	22.1	30.3	5.94	6.49	850	3000	90.7	37.3	22.2	24.7	2.8	65	
30/04/20	7/05/20	11/05/20	12.9	8	<5	7.83	16.8	12.0	23.2	35	6.14	7.20	967	800	86.0	40.9	24.7	23.4	2.7	72	
29/05/20	04/06/20	11/06/20	10.7	8	<5	7.51	17.0	17.7	15.0	32.7	5.61	5.73	902	1150	77.6	34.5	23.3	21.6	2.6	68	
29/06/20	06/07/20	06/07/20	15.0	25	<2	8.07	19.0	14.1	23.7	36.8	6.04	6.98	1002	1000	89.1	40.3	24.1	27.5	2.7	75	
30/07/20	12/08/20	14/08/20	0.9	10	<2	8.02	16.5	7.76	17.9	26.7	4.25	5.01	806	2500	72.5	33	19	22.7	2.4	55	
31/08/20	07/09/20	08/09/20	17.6	5	<2	7.76	18.6	9.6	21.5	31.1	6.55	7.2	915	900	88.7	41.4	23.8	27.8	2.6	70	
30/09/20	7/10/20	19/10/20	14.1	10	<2	7.91	15.9	7.86	22.4	30.3	5.53	6.29	884	1250	92.0	41.5	25.6	29.3	2.7	72	
29/10/20	4/11/20	6/10/20	7.8	15	<2	8.08	14.8	8.28	18.6	26.9	4.95	5.80	762	1250	72.4	35.8	22.3	24.7	2.3	72	
27/11/20	04/12/20	8/12/20	13.1	33	<2	7.9	25.2	4.10	19.9	24.0	7.90	8.64	838	600	92.3	38.7	25.2	30.2	2.7	81	Weir discharge ceased. Pond stagnant.

Table 1d: Annual reporting year summary table of effluent quality at EPA Point No 1 - discharge to Commissioners Water

Reporting Year	Pollutant	Units of Measure	Monitoring frequency required by licence	No. of times measured during year	Min. value	Max. value	90 percentile value	90 percentile limit	Exceedance (yes/no)	Remarks
2016/17	BOD	mg/L	12	12	1	11	8.9	20	No	
	Oil and Grease	mg/L	12	12	<5	<5	<5	10	No	
	Total Suspended Solids	mg/L	12	12	3	40	19	30	No	
2017/18	BOD	mg/L	12	11	2	8	5.6	20	No	Nil discharge into Commissioners Water Jan 2018.
	Oil and Grease	mg/L	12	11	<5	<5	<5	10	No	Nil discharge into Commissioners Water Jan 2018.
	Total Suspended Solids	mg/L	12	11	3	23	13	30	No	Nil discharge into Commissioners Water Jan 2018.
2018/19	BOD	mg/L	12	10	2	16	9.94	20	No	Nil discharge into Commissioners Water Feb & Mar 2019.
	Oil and Grease	mg/L	12	10	<5	<5	<5	10	No	Nil discharge into Commissioners Water Feb & Mar 2019.
	Total Suspended Solids	mg/L	12	10	5	58	30	30	No	Nil discharge into Commissioners Water Feb & Mar 2019.
2019/20	BOD	mg/L	12	8	2	18	15.41	20	No	Nil discharge into Commissioners Water Sept, Oct, Nov, Dec 2019.
	Oil and Grease	mg/L	12	8	<5	<5	<5	10	No	Nil discharge into Commissioners Water Sept, Oct, Nov, Dec 2019.
	Total Suspended Solids	mg/L	12	8	8	23	19.15	30	No	Nil discharge into Commissioners Water Sept, Oct, Nov, Dec 2019.
2020/21	BOD	mg/L	12							
	Oil and Grease	mg/L	12							
	Total Suspended Solids	mg/L	12							

Note: Annual reporting year is from 1 May to 30 April.

Table 1e: Annual reporting year summary table of effluent quality at EPA Point No 6 – electric pump irrigation to Mt Kennedy

Reporting Year	Pollutant	Units of Measure	Monitoring frequency required by licence	No. of times measured during year	Min. value	Max. value	90 percentile value	90 percentile limit	Exceedance (yes/no)	Remarks
2016/17	BOD	mg/L	12	12	3.9	19.1	17.1	20	No	
	Oil and Grease	mg/L	12	12	<5	<5	<5	10	No	
	Total Suspended Solids	mg/L	12	12	3	73	58.4	30	Yes	High algal growth on maturation ponds. No concern. Discharge is irrigated.
2017/18	BOD	mg/L	12	12	3	20.4	15.6	20	No	
	Oil and Grease	mg/L	12	12	<5	<5	<5	10	No	
	Total Suspended Solids	mg/L	12	12	3	120	88.5	30	Yes	High algal growth on maturation ponds. No concern. Discharge is irrigated.
2018/19	BOD	mg/L	12	12	8.3	20	15.8	20	No	
	Oil and Grease	mg/L	12	12	<5	<5	<5	10	No	
	Total Suspended Solids	mg/L	12	12	5	60	50.7	30	Yes	High algal growth on maturation ponds. No concern. Discharge irrigated.
2019/20	BOD	mg/L	12	12	3	18	14.9	20	No	
	Oil and Grease	mg/L	12	12	<5	<5	<5	10	No	
	Total Suspended Solids	mg/L	12	12	5	90	54.8	30	Yes	Pond stagnant. High algal growth. No concern. Discharge is irrigated.
2020/21	BOD	mg/L	12							
	Oil and Grease	mg/L	12							
	Total Suspended Solids	mg/L	12							

Table 1f: Annual reporting year summary table of effluent quality at EPA Point No 7 – diesel pump irrigation to Windways

Reporting Year	Pollutant	Units of Measure	Monitoring frequency required by licence	No of times measured during year	Min. value	Max. value	90 percentile value	90 percentile limit	Exceedance (yes/no)	Remarks
2016/17	BOD	mg/L	12	12	2	23	15.9	20	No	
	Oil and Grease	mg/L	12	12	<5	<5	<5	10	No	
	Total Suspended Solids	mg/L	12	12	3	30	23.6	30	No	
2017/18	BOD	mg/L	12	12	5	22	10.89	20	No	
	Oil and Grease	mg/L	12	12	<5	<5	<5	10	No	
	Total Suspended Solids	mg/L	12	12	5	35	19.3	30	No	
2018/19	BOD	mg/L	12	12	8.3	20	15.8	20	No	
	Oil and Grease	mg/L	12	12	<5	<5	<5	10	No	
	Total Suspended Solids	mg/L	12	12	5	60	52.7	30	Yes	High algal growth. No concern. Discharge is irrigated to paddock.
2019/20	BOD	mg/L	12	12	3	16	15.3	20	No	
	Oil and Grease	mg/L	12	12	<5	<5	<5	10	No	
	Total Suspended Solids	mg/L	12	12	5	35	24.5	30	No	
2020/21	BOD	mg/L	12							
	Oil and Grease	mg/L	12							
	Total Suspended Solids	mg/L	12							

Table 2: Soil monitoring of different soil types in irrigation areas – ongoing – 3 yearly

	Frequency required by licence	Received from laboratory	Accessible on Council website by	Location	Stability (Emerson)	Ex Ca	Ex K	Ex Mg	Ex Na	ESP	pHw	pHca	EC	OM as Org C	Extractable Phosphorus	NO_3 (Mineral N)	PSC
Measure					description	mg/kg	mg/kg	mg/kg	mg/kg	%			dS/cm	%	mg/kg	mg/kg	kg/ha
EPA Point No. 2 Mt Kennedy areas	3 yearly (Rotated locations)																
June 2016		20/06/16	14/08/20	5 tower 2a	water stable, swell	1075	87	390	138	6.4	7.04	6.28	0.133	4.97	21.9	15.6	1700
June 2016		20/06/16	14/08/20	5 tower 2b	Disperse 1	486	23	268	249	18.8	7.26	5.88	0.070	1.23	0.10	1.57	4900
June 2016		20/06/16	14/08/20	5 tower 2e	Slake 1	911	83	295	116	6.5	7.18	6.42	0.126	4.24	46.4	8.22	1400
June 2016		20/06/16	14/08/20	5 tower 2f	Slake 1	797	41	319	251	14.0	7.46	6.32	0.092	1.63	2.10	0.06	7600
June 2016		20/06/16	14/08/20	Eastern 5a	water stable, no swell	902	256	274	113	6.2	6.76	5.84	0.120	4.84	29.3	6.20	1400
June 2016		20/06/16	14/08/20	Eastern 5b	Slake 1	679	55	385	290	15.7	6.56	5.46	0.117	0.80	0.40	0.06	7900
June 2016		20/06/16	14/08/20	Prairie Sth 11a	water stable, swell	1920	502	660	292	7.2	7.28	6.68	0.335	8.89	46.0	4.50	1700
June 2016		20/06/16	14/08/20	Prairie Sth 11b	Disperse 1	720	54	276	855	38.2	7.96	7.08	0.570	1.07	1.20	0.09	4300
June 2016		20/06/16	14/08/20	Shed 12a	water stable, swell	1525	288	440	54	1.9	6.91	6.18	0.129	6.63	48.1	10.5	1400
June 2016		20/06/16	14/08/20	Shed 12b	water stable, swell	743	151	210	30	2.2	6.88	6.00	0.068	2.93	19.9	0.34	1300
June 2016		20/06/16	14/08/20	Prairie Nth 14a	water stable, no swell	2454	143	900	333	6.8	6.97	6.25	0.167	7.75	51.3	8.70	1900
June 2016		20/06/16	14/08/20	Prairie Nth 14b	Slake 2	2042	62	761	497	11.5	8.40	7.28	0.180	2.34	44.3	0.56	2000
June 2017		22/06/17	14/08/20	Creek Nth 16a	water stable, swell	1705	165	615	59	1.76	6.14	5.61	0.080	2.57	20.6	2.6	1400
June 2017		22/06/17	14/08/20	Creek Nth 16b	Slake 2	1152	31	444	157	6.55	7.27	6.30	0.084	0.45	7.6	0.8	1500
June 2017		22/06/17	14/08/20	5 tower 2c	water stable, swell	1229	127	352	94	4.04	6.61	5.95	0.098	2.71	57.2	6.9	1500
June 2017		22/06/17	14/08/20	5 tower 2d	Slake 1	796	45	369	260	13.4	6.84	5.95	0.088	0.85	1.9	1.2	7400
June 2017		22/06/17	14/08/20	Fescue 1 3a	water stable, no swell	1380	78	542	155	5.4	7.09	6.33	0.133	3.05	18.6	4.6	2100
June 2017		22/06/17	14/08/20	Fescue 1 3b	Slake 2	646	32	496	427	19.6	7.56	6.34	0.097	0.33	0.6	18.8	7200
June 2017		22/06/17	14/08/20	East paddock 5c	water stable, no swell	1367	399	444	85	3.0	6.5	5.87	0.095	3.92	23.1	3.0	1900
June 2017		22/06/17	14/08/20	East paddock 5d	Slake 2	1040	97	511	202	8.2	6.65	5.89	0.085	1.04	0.8	0.2	8900
June 2017		22/06/17	14/08/20	Rye 3 8a	water stable, swell	1430	106	441	103	3.8	6.64	5.99	0.088	3.35	56.1	2.4	1500
June 2017		22/06/17	14/08/20	Rye 3 8c	Slake 1	817	40	341	279	14.2	7.22	6.21	0.111	0.32	9.9	0.6	7800
June 2017		22/06/17	14/08/20	Rye 4 9a	water stable, no swell	1943	139	630	210	5.5	6.65	6.12	0.186	4.38	58.2	16.0	1600
June 2017		22/06/17	14/08/20	Rye 4 9c	Slake 1	586	39	255	232	15.7	7.76	6.50	0.112	0.45	3.5	0.9	2500
June 2018		13/06/18	14/08/20	5 tower 2g	water stable 7	848	148	282	248	13.1	5.86	5.32	0.276	2.32	30.4	2.4	2000
June 2018		13/06/18	14/08/20	5 tower 2h	slake 2	992	49	405	168	7.8	6.17	5.39	0.113	0.50	0.20	0.06	5300
June 2018		13/06/18	14/08/20	Fescue Nth 4a	water stable 8	1376	107	581	530	16.0	6.70	6.01	0.470	3.34	21.1	0.54	2000
June 2018		13/06/18	14/08/20	Fescue Nth 4b	slake 2	442	26	288	294	20.8	6.65	5.74	0.127	0.37	0.10	0.02	4600
June 2018		13/06/18	14/08/20	Rye 1 6a	water stable 8	1168	116	391	165	7.0	6.94	6.12	0.133	4.82	37.5	4.04	1300
June 2018		13/06/18	14/08/20	Rye 1 6b	slake 2	730	70	349	268	14.5	7.42	6.27	0.12	0.51	3.2	0.00	7200
June 2018		13/06/18	14/08/20	Rye 2 7a	water stable 8	1096	178	412	240	9.9	6.68	5.96	0.166	5.71	17.60	0.90	2100
June 2018		13/06/18	14/08/20	Rye 2 7b	slake 1	520	65	250	258	18.4	6.94	5.86	0.109	1.10	2.50	0.21	5000
June 2018		13/06/18	14/08/20	House paddock 13a	water stable 7	1380	168	540	238	8.0	7.08	6.29	0.177	5.00	37.60	1.24	1000
June 2018		13/06/18	14/08/20	House paddock 13b	slake 2	665	47	360	280	15.5	7.07	6.15	0.121	1.22	0.70	0.30	4800
June 2018		13/06/18	14/08/20	Creek B 15a	water stable 8	1271	434	514	130	4.5	6.54	5.93	0.171	6.01	28.30	7.05	1500

June 2018		13/06/18	14/08/20	Creek B 15b	slake 1	1504	253	557	353	10.7	7.30	12.00	0.193	1.33	0.40	0.88	4900

Table 2 continued: Soil monitoring of different soil types in irrigation areas – ongoing – 3 yearly

	Frequency required by licence	Received from laboratory	Accessible on Council website by	Location	Stability (Emerson)	Ex Ca	Ex K	Ex Mg	Ex Na	ESP	pHw	pHca	EC	OM as Org C	Extractable Phosphorus	NO_3 (Mineral N)	PSC
Measure					description	mg/kg	mg/kg	mg/kg	mg/kg	%			dS/cm	%	mg/kg	mg/kg	kg/ha
EPA Point No. 2 Mt Kennedy areas	3 yearly (Rotated locations)																
June 2019		06/06/19	14/08/20	5 tower 2a	water stable, no swell	1559	1559	540	178	4.6	6.65	5.87	0.134	3.48	34.4	24.8	2200
June 2019		06/06/19	14/08/20	5 tower 2b	slake 1	1041	1041	447	222	7.7	6.94	5.91	0.104	1.24	1.8	0.41	5800
June 2019		06/06/19	14/08/20	5 tower 2e	water stable	1259	1259	481	338	9.8	7.52	6.48	0.264	4.02	39.8	9.66	1500
June 2019		06/06/19	14/08/20	5 tower 2f	slake 2	657	657	378	394	17.5	7.30	6.23	0.159	0.31	2.00	0.85	10700
June 2019		06/06/19	14/08/20	Eastern 5a	water stable	903	903	337	228	9.4	7.25	6.29	0.172	3.16	22.0	6.83	1100
June 2019		06/06/19	14/08/20	Eastern 5b	slake 2	855	855	524	516	17.3	7.26	6.19	0.204	0.44	1.10	1.79	5800
June 2019		06/06/19	14/08/20	Prairie Sth 11a	water stable	2098	2098	782	551	9.7	7.56	6.83	0.41	6.42	48.8	24.97	1700
June 2019		06/06/19	14/08/20	Prairie Sth 11b	slake 2	704	704	280	1278	42.2	8.06	6.95	1.023	0.39	3.60	13.10	2600
June 2019		06/06/19	14/08/20	Shed 12a	water stable, no swell	1687	1687	549	64	1.6	6.52	5.93	0.233	5.59	54.6	40.7	900
June 2019		06/06/19	14/08/20	Shed 12b	slake 2	1021	1021	310	90	3.7	7.05	6.24	0.135	1.69	47.2	10.32	1400
June 2019		06/06/19	14/08/20	Prairie Nth 14a	water stable, no swell	2751	2751	1091	326	4.5	7.02	6.32	0.186	6.80	51.6	13.59	1500
June 2019		06/06/19	14/08/20	Prairie Nth 14b	slake 1	2092	2092	771	564	10.0	8.55	6.81	0.192	1.69	43.7	2.73	900
June 2020		22/06/20	14/08/20	Surface (WW 1a)	water stable, no swell	1412	125	490	94	3.5	6.38	5.37	0.150	4.66	36.7	53.1	1200
June 2020		22/06/20	14/08/20	Subsoil (WW1b)	slake 3	1241	102	1044	426	11.0	6.72	5.48	0.155	1.06	0.1	4.5	7900
June 2020		22/06/20	14/08/20	Creek Nth (16a)	water stable, no swell	3483	242	1416	118	1.71	7.70	6.60	0.241	6.81	31.3	5.9	1300
June 2020		22/06/20	14/08/20	Creek Nth (16b)	slake1	2655	100	984	338	6.36	8.24	6.70	0.329	1.38	4.1	0.3	2800
June 2020		22/06/20	14/08/20	Surface 5 Tower 2c	water stable, no swell	1291	160	524	76	2.87	7.01	6.58	0.161	4.08	56.5	20.8	1500
June 2020		22/06/20	14/08/20	Subsoil 5 Tower 2d	slake 3	783	71	545	302	13.3	7	6.52	0.148	1.13	1.1	12.3	15900
June 2020		22/06/20	14/08/20	Surface Fescue 1 3a	water stable, no swell	1661	193	713	118	3.4	7.12	6.46	0.172	5.53	30.4	9.9	1500
June 2020		22/06/20	14/08/20	Subsoil Fescue 1 3b	slake 3	555	42	343	283	17.8	7.75	6.47	0.093	0.52	0.1	0.1	7600
June 2020		22/06/20	14/08/20	Surface East Paddock 5c	water stable, no swell	1727	282	605	91	2.7	7.00	6.37	0.137	6.15	47.2	10.6	1400
June 2020		22/06/20	14/08/20	Subsoil East Paddock 5d	slake 3	667	156	257	120	8.2	7.81	6.43	0.068	1.13	4.7	0.5	2800
June 2020		22/06/20	14/08/20	Surface Rye 3 – 8a	water stable, no swell	1308	292	534	148	5.2	6.86	6.32	0.194	5.25	24.8	15.0	1700
June 2020		22/06/20	14/08/20	Subsoil Rye 3 – 8b	slake2	547	52	294	237	16.4	7.35	6.31	0.126	0.88	0.9	0.5	4600
June 2020		22/06/20	14/08/20	Surface Rye 4 – 9a	water stable, no swell	1846	220	715	155	4.1	7	6.32	0.18	6.8	28.8	14.6	1400
June 2020		22/06/20	14/08/20	Subsoil Rye 4 – 9b	slake1	523	51	287	299	20.3	8.12	6.37	0.135	0.71	0.4	0.3	2900

Table 2 continued: Soil monitoring of different soil types in irrigation areas – ongoing – 3 yearly

	Frequency required by licence	Received from laboratory	Accessible on Council website by	Location	Stability (Emerson)	Ex Ca	Ex K	Ex Mg	Ex Na	ESP	pHw	pHca	EC	OM as Org C	Extractable Phosphorus	NO_3 (Mineral N)	PSC
Measure					description	mg/kg	mg/kg	mg/kg	mg/kg	%			dS/cm	%	mg/kg	mg/kg	kg/ha
EPA Point No. 4 Windways areas	3 yearly (Rotated locations)																
June 2016		20/06/16	14/08/20	Windways 1e	water stable, swell	1870	129	691	174	4.7	6.46	5.82	0.150	5.47	34.1	20.9	1800
June 2016		20/06/16	14/08/20	Windways 1f	water stable, swell	1372	69	660	273	8.7	6.70	5.80	0.126	2.02	0.70	0.17	2700
June 2017		22/06/17	14/08/20	Windways 1a	water stable, swell	1284	138	273	55	2.5	5.74	5.20	0.091	3.07	42	8.0	1000
June 2017		22/06/17	14/08/20	Windways 1b	water stable, swell	632	40	221	101	7.5	6.44	5.51	0.045	0.91	12.3	2.2	4700
June 2018		13/06/18	14/08/20	Windways 1c	water stable 7	1461	94	384	144	5.4	6.24	5.62	0.158	2.30	53.6	11.2	900
June 2018		13/06/18	14/08/20	Windways 1d	slake 2	1551	67	629	256	7.7	7.18	6.04	0.103	0.51	3.30	3.05	4800
June 2019		06/06/19	14/08/20	Windways 1e	water stable, no swell	1969	140	772	227	5.6	6.91	6.18	0.156	3.86	27.00	26.00	2000
June 2019		06/06/19	14/08/20	Windways 1f	Water stable swell	1505	71	727	362	10.3	6.92	5.95	0.158	1.19	1.60	1.19	2900
June 2020		22/06/20	14/08/20	Surface (WW 1a)	water stable, no swell	1412	125	490	94	3.5	6.38	5.37	0.150	4.66	36.7	53.1	1200
June 2020		22/06/20	14/08/20	Subsoil (WW1b)	slake 3	1241	102	1044	426	11.0	6.72	5.48	0.155	1.06	0.1	4.5	7900

Table 3: Treated wastewater discharge & irrigation volumes

	Frequency required by licence	Reporting month	Month's Total	Lowest daily volume	Mean daily volume	Greatest daily volume
Electronic measure			kL	kL/day	kL/day	kL/day
EPA Point No. 1 (Commissioners Waters)	/daily					
		Jan 2016	84566	0	2727.9	5682
		Feb 2016	55216	0	1972	5938
		Mar 2016	0	0	0	0
		Apr 2016	1882	0	62.7	283
		May 2016	35740	0	11529	4356
		Jun 2016	78834	1032	2627	5804
		Jul 2016	210967	4592	6805	14510
		Aug 2016	387957	6371	12514.7	27000
		Sep 2016	204042	4710	6801.4	10054
		Oct 2016	158488	2476	5112.5	9324
		Nov 2016	66558	0	2218.6	12770
		Dec 2016	19260	0	642	5276
		Jan 2017	6269.6	0	783.7	1575.1
		Feb 2017	81596	1878	2914	3629
		Mar 2017	230936	8.0	7449.5	36286
		Apr 2017	212397.6	258.6	7079.9	23504.0
		May 2017	173222	3560	5587.8	9178
		Jun 2017	213060.0	3998.0	7346.9	35692
		Jul 2017	258636	5978	8343	22468
		Aug 2017	96242	1454	3104.6	6304
		Sep 2017	40420	0	1347.3	5146
		Oct 2017	132521.6	0	4274.9	13688.0
		Nov 2017	34900.0	0	1163.3	4330.0
		Dec 2017	15698	0	523.3	2338.0
		Jan 2018	0	0	0	0
		Feb 2018	8006	0	286	4332
		Mar 2018	30778	0	992.8	3582
		Apr 2018	1628	0	54.3	884
		May 2018	47470	0	1531.3	4672
		Jun 2018	74592	0	2486.4	5500
		July 2018	153394	2422	4948	8914
		Aug 2018	87340	0	2817.4	7398
		Sep 2018	101640	0	3388	10038
		Oct 2018	156528	1004	5049.3	10174
		Nov 2018	58794.0	170	1959.8	4366

	Frequency required by licence	Reporting month	Month's Total	Lowest daily volume	Mean daily volume	Greatest daily volume	Accessible on Council website
Electronic measure			kL	kL/day	kL/day	kL/day	
EPA Points Nos. 3 & 5 (Mt Kennedy & Windways irrigation areas)	daily						
		Jan 2016	43748	0	1411	5746	12/02/16
		Feb 2016	83247	0	2775	3965	08/03/16
		Mar 2016	145126	2791	4681	5866	14/04/16
		Apr 2016	104874	1350	3496	5488	14/05/16
		May 2016	79545	783	2566	4693	14/06/16
		Jun 2016	18138	0	605	3827	06/07/16
		Jul 2016	17024	0	549	3031	11/08/16
		Aug 2016	57274	0	1848	13523	14/09/16
		Sep 2016	0	0	0	0	12/10/16
		Oct 2016	0	0	0	0	14/11/16
		Nov 2016	83746	0	2792	5318	14/12/16
		Dec 2016	127345	2465	4108	5299	10/01/17
		Jan 2017	120587	1641	3890	5203	16/02/17
		Feb 2017	129897	3049	4639	5641	16/03/17
		Mar 2017	68603	0	2213	5275	05/05/17
		Apr 2017	15309.2	0	510	5110	05/05/17
		May 2017	32272	0	1041	3084	06/06/17
		Jun 2017	20497	0	683	2756	12/07/17
		Jul 2017	1187	0	38	688	16/08/17
		Aug 2017	88455	0	2853	4063	11/09/17
		Sep 2017	122623	150	4087	5822	11/10/17
		Oct 2017	66147	0	2134	5316	09/11/17
		Nov 2017	113989	396	3800	5648	11/12/17
		Dec 2017	136237	2531	4395	5807	08/01/18
		Jan 2018	139368	2574	4496	6420	08/02/18
		Feb 2018	118678	1194	4239	5899	14/03/18
		Mar 2018	129098	0	4164	6022	23/04/18
		Apr 2018	142490	2504	4750	5920	08/05/18
		May 2018	110339	0	3559	5558	08/06/18
		Jun 2018	82562	629	2752	4889	09/07/18
		July 2018	34559	0	1115	3025	27/08/18
		Aug 2018	84460	0	2725	5117	12/09/18
		Sep 2018	648114	0	2160	5538	12/10/18
		Oct 2018	61343	0	1979	5195	13/11/18
		Nov 2018	130409	2542	4347	5912	14/12/18

		Dec 2018	55088.0	88	1836.3	6522			Dec 2018	118789	1212	3832	5953		08/01/19

Frequency of measurement required by licence is daily, and the daily limits are **16,500 kL** for discharge to Commissioners Waters; and **7,000 kL** for only EPA Point 3, the Mt Kennedy irrigation areas.

Table 3 continued: Treated wastewater discharge & irrigation volumes

	Frequency required by licence	**Reporting month**	**Month's Total**	**Lowest daily volume**	**Mean daily volume**	**Greatest daily volume**		**Frequency** required by licence	**Reporting month**	**Month's Total**	**Lowest daily volume**	**Mean daily volume**	**Greatest daily volume**	**Accessible** on Council website
Electronic measure			kL	kL/day	kL/day	kL/day	Electronic measure			kL	kL/day	kL/day	kL/day	
EPA Point No. 1 (Commissioners Waters)	/daily						**EPA Points Nos. 3 & 5** (Mt Kennedy & Windways irrigation areas)	daily						
		Jan 2019	6706	0	216.3	1870			Jan 2019	118399	8	3819	7115	22/02/19
		Feb 2019	0	0	0	0			Feb 2019	136600	1993	4879	6264	14/03/19
		Mar 2019	0	0	0	0			Mar 2019	127882	0	4125	6190	05/04/19
		Apr 2019	362	0	12.1	201			Apr 2019	127152	2489	4238	5987	10/05/19
		May 2019	28206	0	909.9	2440			May 2019	112442	322	3627	5340	12/06/19
		June 2019	43170	0	1439	3634			Jun 2019	85197	1194	2840	5477	25/07/19
		July 2019	56712	0	1829	3894			July 2019	83608	843	2697	5547	08/08/19
		Aug 2019	32068	0	1034	3014			Aug 2019	106936	1587	3450	5915	05/09/19
		Sep 2019	0	0	0	0			Sep 2019	117227	968	3908	6127	8/11/19
		Oct 2019	0	0	0	0			Oct 2019	113231	1023	3653	5600	8/11/19
		Nov 2019	0	0	0	0			Nov 2019	84281	1416	2809	3881	9/12/19
		Dec 2019	0	0	0	0			Dec 2019	86794	0	2800	5255	07/01/20
		Jan 2020	70300	0	2268	15072			Jan 2020	82661	0	2666	6521	07/02/20
		Feb 2020	250236	474	8629	26318			Feb 2020	16730	0	577	3678	09/03/20
		Mar 2020	155386	3528	5012	6542			Mar 2020	6479	0	209	3848	9/04/20
		Apr 2020	101354	784	3378	8036			Apr 2020	47916	0	1597	3302	11/05/20
		May 2020	72960	514	2354	5506			May 2020	63912	0	2062	4436	11/06/20
		June 2020	118586	1388	3953	6324			June 2020	29329	0	978	3495	06/07/20
		July 2020	138784	2232	4477	9356			July 2020	22510	0	726	2823	14/08/20
		Aug 2020	167570	4174	5405	8198			Aug 2020	0	0	0	0	08/09/20
		Sep 2020	108190	820	3606	13514			Sep 2020	41094	0	1370	3964	19/10/20
		Oct 2020	90936.9	0.0	2933.4	9719.1			Oct 2020	58913	0	1900	7783	06/11/20
		Nov 2020	33931	0	1131	7688			Nov 2020	90400	0	3013	5112	08/12/20

Table 4: Biosolids sludge volume monitoring

	Frequency required by licence	Reporting month	Sludge lagoons	to Mt Kennedy areas	to Windways areas	Accessible on Council website
Measure			kL (~m³)	kL (~m³)	kL (~m³)	
EPA Point No. 8	daily during discharge					
		Jan 2016	No desludging	No sludge spread during this period		04/03/16
		Feb 2016	No desludging			07/04/16
		Mar 2016	No desludging			7/05/16
		Apr 2016	No desludging			05/06/16
		May 2016	No desludging			07/07/16
		Jun 2016	680	680		09/08/16
		July 2016	260		260	09/09/16
		Aug 2016	No desludging	No sludge spread during this period		09/10/16
		Sep 2016	No desludging			09/11/16
		Oct 2016	No desludging			
		Nov 2016	No desludging			07/12/16
		Dec 2016	No desludging			07/01/16
		Jan 2017	No desludging			16/02/17
		Feb 2017	No desludging			16/03/17
		Mar 2017	No desludging			05/05/17
		Apr 2017	No desludging			05/05/17
		May 2017	No desludging			06/06/17
		Jun 2017	115		115	12/07/17
		Jul 2017	1260	150	1110	16/08/17
		Aug 2017	290	290	0	11/09/17
		Sep 2017	No desludging	No sludge spread during this period		11/10/17
		Oct 2017	No desludging			09/11/17
		Nov 2017	No desludging			11/12/17
		Dec 2017	No desludging			08/01/18
		Jan 2018	No desludging			08/02/18
		Feb 2018	No desludging			14/03/18
		Mar 2018	No desludging			23/04/18
		Apr 2018	No desludging			08/05/18
		May 2018	720	680	40	08/06/18
		June 2018	650		650	09/07/18
		July 2018	140		140	27/08/18
		Aug 2018	1140		1140	12/09/18
		Sep 2018	No desludging	No sludge spread during this period		12/10/18
		Oct 2018	No desludging			13/11/18
		Nov 2018	No desludging			14/12/18

Table 4: continued

	Frequency required by licence	Reporting month	Sludge lagoons	to Mt Kennedy areas	to Windways areas	Accessible on Council website
Measure			kL (~m³)	kL (~m³)	kL (~m³)	
EPA Point No. 8	daily during discharge					
		Jan 2019	No desludging	No sludge spread during this period		22/02/19
		Feb 2019	No desludging			14/03/19
		Mar 2019	No desludging			05/04/19
		Apr 2019	No desludging			10/05/19
		May 2019	No desludging			12/06/19
		Jun 2019	No desludging			25/07/19
		July 2019	No desludging			08/09/19
		Aug 2019	No desludging			05/09/19
		Sep 2019	No desludging			08/11/19
		Oct 2019	No desludging			08/11/19
		Nov 2019	No desludging			9/12/19
		Dec 2019	No desludging			7/01/2020
		Jan 2020	No desludging			11/06/20
		Feb 2020	No desludging			11/06/20
		Mar 2020	No desludging			11/06/20
		Apr 2020	No desludging			11/06/20
		May 2020	No desludging			11/06/20
		Jun 2020	No desludging			06/07/20
		July 2020	810	730	80	14/08/20
		Aug 2020	760	0	760	08/09/20
		Sept 2020	No desludging	0	0	19/10/20
		Oct 2020	No desludging	0	0	6/11/20

		Dec 2018	No desludging		08/01/19							

Table 5: Biosolids sludge quality monitoring

	Frequency required by licence	**Reporting month**	**Ca**	**Cl**	**EC**	**Mg**	**Moisture**	**NO_3**	**TN**	**TP**	**K**	**Na**	**SAR**	**S**	**pH**	**Received** from laboratory	**Accessible** on Council website
Measure			mg/kg	mg/kg	us/cm	mg/kg	as % DW	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	ratio	mg/kg	1-14		
EPA Point No. 9	quarterly (every third month of discharge)																
	Lagoon 3	Jun 2017	20150	225	2920	3190	6.2	1120	29850	17121	2236	2569	4.44	6700	7.06	13/08/17	13/07/17
	Lagoon 2	Aug 2017	24504	2553	3590	3497	6.3	736	32120	17744	2170	2632	4.2	9.259	7.24	13/08/17	13/08/17
	Lagoon 2	Jun 2018	28195	2210	3230	4282	4.1	60.0	44700	18284	2359	3347	4.9	9608	7.33	21/06/18	09/07/18
	Lagoon 3	Aug 2018	14624	1510	3.35	4246	3.3	690	4.22	17288	2585	4651	8.7	7297	8.18	13/09/18	12/10/18
		Jul 2020	No biosolids have been sprayed since August 2018.														
	Lagoon 4	Aug 2020	20989	4520	4460	3340	6.2	120	22930	15100	1790	2800	5.1	6770	7.62	12/08/20	14/08/20

Table 6a: Groundwater quality & depth – WW1, WW2, WW3

Wells	Frequency required by licence	DO	EC	pH	Eh	Temp	D	WL RL	Received from laboratory	Accessible on Council website by	NO_x	TKN	TN	TP
Measure		mg/L	µS/cm	1-14	mV	ºC	m	m			mg/L as N	mg/L as N	mg/L	mg/L
WW1	6 monthly								**WW1**					
Sampling date														
01/12/16		1.27	1632	6.98	+178	17.2	10.51	966.42	08/12/16	30/12/16	2.42	0.3	2.7	0.02
28/03/17		1.27	1613	6.75	+51	17.2	10.50	966.43	06/04/17	01/05/17	2.10	0.2	2.3	<0.01
05/10/17		1.13	1551	6.83	+187	10.4	10.22	966.71	12/10/17	01/11/17	1.82	0.3	2.1	0.02
02/04/18		1.01	1571	6.82	-22	21.2	10.80	966.13	09/04/18	27/04/18	1.86	0.4	2.3	0.02
03/01/19		0.24	1596	7.13	+141	18.5	11.48	965.45	17/01/19	08/02/19	1.32	0.2	1.5	0.02
12/04/19		1.00	1593	6.94	+103	17.2	11.67	965.26	24/04/19	15/05/19	1.20	0.2	1.4	0.02
19/09/19		0.78	1651	6.96	+123	17.9	11.89	965.04	26/09/19	11/10/19	1.06	0.2	1.3	0.01
06/05/20		0.46	1615	7.00	+138	16.6	10.21	966.72	12/05/20	01/06/20	1.12	0.3	1.4	0.02
28/10/20	Well standpipe bent over. Vehicle impression noted. Internal PVC standpipe squeezed. Not possible to insert pump.													
WW2	6 monthly								**WW2**					
01/12/16		0.21	1326	7.16	+129	16.3	1.63	953.35	08/12/16	30/12/16	0.05	<0.1	<0.1	<0.01
28/03/17		0.18	1326	6.89	+27	18.3	0.94	954.04	06/04/17	01/05/17	0.04	<0.1	<0.1	<0.01
05/10/17		0.00	1308	6.99	+171	8.2	1.38	953.60	12/10/17	01/11/17	0.04	<0.1	<0.1	<0.01
02/04/18		0.20	1228	6.93	+84	21.1	1.83	953.15	09/04/18	27/04/18	0.06	<0.1	<0.1	<0.01
03/01/19		0.10	1305	7.20	+158	18.6	1.93	953.05	17/01/19	08/02/19	0.06	<0.1	<0.1	<0.01
12/04/19		0.16	1294	7.00	+121	16.0	2.13	952.85	24/04/19	15/05/19	0.05	<0.1	<0.1	<0.01
19/09/19		0.15	1298	7.01	+107	16.5	2.05	952.93	26/09/19	11/10/19	0.03	<0.1	<0.1	<0.01
06/05/20		0.11	1239	7.18	+95	17.5	1.50	953.48	12/05/20	01/06/20	0.04	0.2	0.2	<0.01
28/10/20		0.11	1218	7.11	+168	16.1	1.46	953.52	09/11/20	27/11/20	0.05	<0.1	<0.1	0.03
WW3	6 monthly								**WW3**					
01/12/16		1.16	968	7.89	-52	16.8	1.69	954.11	08/12/16	30/12/16	0.31	<0.1	0.3	0.04
28/03/17		0.35	968	8.48	+51	19.5	1.48	954.32	06/04/17	01/05/17	0.18	<0.1	0.2	<0.01
05/10/17		0.75	951	8.05	-125	8.6	1.37	954.43	12/10/17	01/11/17	0.18	<0.1	0.2	0.04
02/04/18		0.89	901	8.66	-186	22.1	2.17	953.63	09/04/18	27/04/18	0.57	0.2	0.8	0.03
03/01/19		0.23	949	8.09	-125	18.0	2.45	953.35	17/01/19	08/02/19	0.32	0.1	0.4	0.04
12/04/19		0.54	918	7.99	-75	16.2	2.70	953.10	24/04/19	15/05/19	0.51	<0.1	0.5	0.04
19/09/19		0.68	930	7.69	-44	17.3	2.72	953.08	26/09/19	11/10/19	0.30	<0.1	0.3	0.02
06/05/20		0.30	901	7.64	-12	18.0	1.91	953.89	12/05/20	01/06/20	0.14	0.2	0.3	0.04
28/10/20		0.27	905	7.41	-14	17.8	1.50	954.30	09/11/20	27/11/20	0.02	<0.1	<0.1	0.05

Table 6b: Groundwater quality & depth – P3, P6, P7

Wells	Frequency required by licence	DO	EC	pH	Eh	Temp	D	WL RL	Received from laboratory	Accessible on Council website by	NO_x	TKN	TN	TP
Measure		mg/L	µS/cm	1-14	mV	ºC	m	m			mg/L as N	mg/L as N	mg/L	mg/L
P3	6 monthly								**P3**					
Sampling date														
01/12/16		DRY							DRY					
28/03/17		DRY							DRY					
05/10/17		DRY							DRY					
02/04/18		DRY							DRY					
03/01/19		DRY							DRY					
15/04/19		DRY							DRY					
19/09/19		DRY							DRY					
06/05/20		DRY							DRY					
28/10/20		DRY							DRY					
P6	6 monthly								**P6**					
01/12/16		5.20	1438	6.96	+128	17.9	4.27	957.42	08/12/16	30/12/16	0.14	0.5	0.6	0.04
28/03/17		2.93	1366	6.42	+119	21.1	4.59	957.10	06/04/17	01/05/17	0.15	0.4	0.6	0.15
05/10/17		5.79	1333	7.91	+207	15.8	4.31	957.38	12/10/17	01/11/17	0.08	0.4	0.5	0.04
02/04/18		3.00	1125	6.90	+67	26.1	4.72	956.97	09/04/18	27/04/18	0.12	0.4	0.5	<0.01
03/01/19		3.73	866	7.20	+113	19.3	4.69	957.00	17/01/19	08/02/19	0.18	0.3	0.5	0.04
15/04/19		3.86	751	6.79	+203	19.2	5.02	956.67	24/04/19	15/05/19	0.19	0.1	0.3	<0.01
19/09/19		5.61	744	6.95	+190	15.6	4.99	956.70	26/09/19	11/10/19	0.11	0.2	0.3	<0.01
06/05/20		6.19	634	7.53	+204	18.9	4.54	957.15	12/05/20	01/06/20	0.16	0.8	1.0	0.01
28/10/20		5.20	1319	6.46	+124	18.1	4.61	957.08	09/11/20	27/11/20	0.06	0.4	0.5	0.03
P7	6 monthly								**P7**					
01/12/16		9.63	452	7.43	+132	20.2	1.37	960.32	08/12/16	30/12/16	0.03	0.1	0.1	0.16
28/03/17		7.60	383	6.20	+109	22.7	1.23	960.46	06/04/17	01/05/17	0.05	<0.1	<0.1	0.14
05/10/17		11.85	378	7.63	+247	8.0	1.33	960.36	12/10/17	01/11/17	0.11	<0.1	0.1	0.18
02/04/18		8.65	374	7.67	+84	25.1	1.65	960.04	09/04/18	27/04/18	0.17	0.2	0.4	0.18
03/01/19		9.01	473	7.69	+107	21.3	1.52	960.69	17/01/19	08/02/19	0.17	0.4	0.6	0.23
15/04/19		7.96	375	7.49	+152	18.1	1.90	959.79	24/04/19	15/05/19	0.18	<0.1	0.2	0.18
19/09/19		9.74	372	7.81	+176	14.6	1.60	960.09	26/09/19	11/10/19	0.14	<0.1	0.1	0.18
06/05/20		8.30	371	7.41	+233	18.7	1.19	960.50	12/05/20	01/06/20	0.11	0.9	1.0	0.17
28/10/20		8.43	336	7.21	+112	17.2	1.49	960.20	09/11/20	27/11/20	0.13	0.2	0.3	0.20

Table 6c: Groundwater quality & depth – P14, P17

Wells	Frequency required by licence	DO	EC	pH	Eh	Temp	D	WL RL	Received from laboratory	Accessible on Council website by	NO_x	TKN	TN	TP	Remarks
Measure		mg/L	µS/cm	1-14	mV	ºC	m	m			mg/L as N	mg/L as N	mg/L	mg/L	
P14	6 monthly								**P14**						
Sampling date															
01/12/16		4.66	561	6.88	+169	23.1	2.16	958.91	08/12/16	30/12/16	1.32	0.5	1.8	0.18	
28/03/17		4.07	466	6.58	+133	22.3	1.48	959.59	06/04/17	01/05/17	1.77	1.0	2.8	0.18	
05/10/17		4.75	616	7.31	+224	16.9	1.41	959.66	12/10/17	01/11/17	3.08	0.7	3.8	0.16	
02/04/18		3.95	462	7.21	-45	23.4	2.67	958.40	09/04/18	27/04/18	1.98	0.6	2.6	0.23	
03/01/19		4.92	716	7.13	+187	22.1	2.28	958.79	17/01/19	08/02/19	3.85	0.9	4.8	0.16	
15/04/19		5.73	601	7.13	+221	19.3	2.73	958.34	24/04/19	15/05/19	3.61	0.8	4.4	0.16	
19/09/19		7.69	681	6.95	+140	16.0	2.53	958.54	26/09/19	11/10/19	5.24	0.8	6.0	0.14	
06/05/20		6.24	665	7.26	+277	18.3	2.33	958.74	12/05/20	01/06/20	2.93	1.1	4.0	0.17	
30/10/20		5.11	770	7.12	+119	16.8	1.16	959.91	09/11/20	27/11/20	3.37	0.8	4.2	0.15	
P17	6 monthly								**P17**						
01/12/16		1.79	3055	7.40	+187	17.9	3.07	954.57	08/12/16	30/12/16	7.10	1.1	8.2	0.13	
28/03/17		1.96	3045	7.11	+176	21.7	3.36	954.28	06/04/17	01/05/17	5.06	0.8	5.9	<0.05	
05/10/17		4.46	2955	6.88	+147	15.7	3.30	954.34	12/10/17	01/11/17	6.73	0.9	7.6	0.08	
02/04/18		3.22	2877	7.10	+40	21.2	3.28	954.36	09/04/18	27/04/18	5.91	0.6	6.5	0.11	
03/01/19		2.25	2896	7.47	+214	19.3	3.27	954.37	17/01/19	08/02/19	4.78	0.6	5.4	0.10	
15/04/19		2.63	2662	7.50	+242	19.0	1.73	955.91	24/04/19	15/05/19	4.48	0.6	5.1	0.11	
19/09/19		5.51	2503	7.67	+170	16.7	3.48	954.16	26/09/19	11/10/19	4.35	0.4	4.8	0.10	
06/05/20		5.96	2470	8.17	+126	18.3	3.35	954.29	12/05/20	01/06/20	9.24	0.8	10.0	0.13	
30/10/20		2.72	4460	7.53	+116	16.6	3.17	954.47	09/11/20	27/11/20	19.00	3.4	22.4	0.11	Fresh biosolids upgradient.