



Akaroa

Wastewater Treatment Plant

Annual Monitoring Report

July 2020 – June 2021

Prepared by: Citycare Water
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On behalf of:

Christchurch City Council, City Water & Waste Unit

01 September 2021



Resource Consent Number: CRC202179
File Number: CO6C/01282
Client Name: Christchurch City Council
To: To discharge treated effluent from the Akaroa wastewater treatment plant into the Coastal Waters.
Consent Location: Beach Road, AKAROA HARBOUR
State: Current

Events:

8/10/2013 Commencement Date
 21/02/2020 Consent Number Issued
 01/01/9999 Lapse Date if not Given Effect To

1	The discharge shall be only treated wastewater from the Akaroa Wastewater Treatment Plant (WWTP), located at Redhouse Bay, Akaroa Harbour at or about map reference (NZMG) NZMS 260: N37: 0569-0984; (NZTM) Topo 50: BY25:9568-4825, as shown on Plan CRC133179A, which forms part of this consent.
	Compliance
2	Treated wastewater from the Akaroa Wastewater Treatment Plant shall be discharged into Akaroa Harbour via an existing 100-metre-long submerged outfall at or about map reference (NZMG) NZMS 260: N37: 0558-0991; (NZTM) Topo 50: BY25:9558-4831, as shown on Plan CRC133179A.
	Compliance
3	Warning notices, which can be read from a distance of five metres, shall be erected and maintained at the following locations: On the shoreline 400 metres either side of the point on the shoreline nearest the outfall, and Beside Beach Road adjacent to the rocks that lead out to Green Point. The warning notices shall advise the public of the existence of a wastewater outfall and the dangers of swimming in the area or eating shellfish collected in that location.
	Compliance
4	a. The volume of wastewater discharged from the Akaroa Wastewater Treatment Plant shall be continuously recorded using a flow meter. b. The readings from the flow meter shall be recorded in litres per second and shall be used to calculate the daily volume of wastewater discharged from the treatment plant. These daily volumes shall be recorded and used to determine compliance with Condition (5).
	Compliance (Attachment 1)
5	The volume of treated wastewater discharged shall not exceed 1500 cubic metres per day, except during rainfall events of a total of 50 millimetres or more over three consecutive days. Note: For the purposes of this condition, the rainfall shall be that measured at the Akaroa EWS weather station operated by NIWA (Agent number = 36593).
	Non-Compliant (Attachments 1.1, 1.2 and 2.1); >1500m³ recorded on 5 occasions and all of these were when rainfall exceeded depth of 50mm (over 3 days).
6	Treated wastewater shall be sampled after treatment and prior to discharge into Akaroa Harbour via the outfall. The samples shall be grab samples collected at the frequencies specified, and analysed for the contaminants listed in Table 1: Treated wastewater quality monitoring – contaminants and sampling frequency Weekly (1 Dec-28 Feb) Faecal coliforms, enterococci, total suspended solids (TSS), total five day biochemical, oxygen demand (BOD5), dissolved reactive phosphorous (DRP), ammonia, Nitrogen oxides (NOx), total phosphorus (TP), Total nitrogen (TN), temperature Monthly (between 1 Mar and 30 Nov) Faecal coliforms, enterococci, total suspended solids (TSS), BOD5, DRP, ammonia, NOx, TP, TN, temperature Annually (during Jan) lead, copper, chromium, cadmium, zinc
	Compliance (Attachment 3.1)
7	Sampling shall be undertaken in accordance with the sampling schedule in Conditions (6), (12) and (16). The schedule shall seek to incorporate sampling during times with variable environmental parameters listed in Condition (20) (b) to (d) This schedule is to be agreed with the Canterbury Regional Council's RMA Compliance and Enforcement Manager within one month of the commencement of this consent.
	Compliance
8	The median concentration of faecal coliforms in the treated wastewater shall not exceed 1,000 per 100

	millilitres
	Compliance (Attachment 3.1); median was exceeded on 0 occasions.
9	The consent holder shall use the best practicable option to ensure the median concentration of BOD5 and TSS does not exceed 30 grams per cubic metre
	Compliance for BOD₅ (Attachment 3.1); maximum medians were 18 mg/l BOD₅ and 2 individual non-compliances for TSS and 4 median non-compliances however, 2 were caused due to previous years results(Attachment 3.1); max (5 sample median) of 48 mg/L
10	For the purposes of conditions (8) and (9) the median shall be calculated from the results of any five consecutive treated wastewater samples analysed
	Compliance (Attachment 3.1)
11	The receiving water shall be sampled and analysed for faecal coliforms and enterococci at the following locations, as shown on Plan CRC133179B, which forms part of this consent: a. At the shoreline nearest the outfall; b. 400 metres along the shoreline in a southerly direction from Site (a); and c. 400 metres along the shoreline in a northerly direction from Site (a).
	Compliance (Attachment 3.2)
12	Receiving water sampling and analysis for faecal coliforms and enterococci concentrations shall occur at least weekly between 1 December and 28 February each year and at least monthly for faecal coliforms between 1 March and 3 November each year. Receiving water sampling shall occur within six hours of treated wastewater sampling.
	Compliance (Attachment 3.2)
13	In the event that the analysis of receiving water samples collected at each site beyond the 250-metre mixing zone in accordance with Conditions (11) and (12) indicates: a. A concentration of faecal coliforms that exceeds a rolling median of 14 faecal coliforms per 100 millilitres from the previous five samples collected in the period 1 December to 28 February each year, the consent holder shall notify the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within one month of detecting the exceedance; b. That the concentration of the faecal coliforms in more than ten percent of total samples collected between 1 December and 28 February each year exceeds 43 faecal coliforms per 100 millilitres, the consent holder shall notify the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within one month of detecting the exceedance.
	Non-Compliance (Table 1 and Attachment 3.2); 7 five sample medians greater than 14 FC for the sampling period and 15.4% results greater than 43 FC for the sampling period
14	The notification required under Condition (13) shall include the information required to be collected in Condition (20) and shall identify whether the exceedance is likely to have resulted from wastewater discharged from the Akaroa Wastewater Treatment Plant and if so, shall detail what measures the consent holder has implemented or will implement to mitigate any adverse environmental effects as a result of the exceedance, and to prevent a reoccurrence.
	CCC provided reports throughout the year
15	Grab samples of the receiving water shall be collected and analysed for temperature, Total Nitrogen (TN), Dissolved Inorganic Nitrogen (DIN, calculated as NO _x + ammonia), Total Phosphorus (TP), chlorophyll-a and Dissolved Reactive Phosphorus (DRP) at the following locations as shown on Plan Consent detail CRC133179C, which forms part of this consent: a. 250 metres due north of the outfall; b. 250 metres due west of the outfall; c. 250 metres due south of the outfall; d. A control site located at or about map reference (NZMG) NZMS 260: N36:0592-1117; (NZTM) Topo 50: BY25:959-4958, located in French Bay; and e. A control site located at or about map reference (NZMG) NZMS 260: N36:0472-1056; (NZTM) Topo 50: BY25:9471-4897, [potential site of long term outfall].
	Compliance (Attachment 3.3)
16	The receiving water sampling and analysis carried out in accordance with Condition (15) shall occur once every three weeks between 1 December and 28 February each year such that a total of four samples are taken over the summer period. Receiving water sampling shall occur within six hours of treated wastewater sampling.
	Compliance (Attachment 3.3)
17	For individual sampling events (as detailed in Condition (16)), if collected in accordance with Conditions (15)

	<p>(a) to (c) indicates trigger values of:</p> <p>a. Dissolved inorganic nitrogen (DIN) (combined total of NO_x and ammonia) that exceeds a median of 0.062 milligrams per litre (mg/L);</p> <p>b. Dissolved reactive phosphorus (DRP) that exceeds a median of 0.018 mg/L; and</p> <p>c. Ammonia that exceeds a maximum of 0.910 mg/L;</p> <p>the consent holder shall identify whether the Akaroa Wastewater Treatment Plant is operating abnormally and if so, shall record what measures the consent holder has implemented or will implement to return the Akaroa Wastewater Treatment Plant to normal operation, and to prevent a reoccurrence.</p>
	Compliance (Attachment 3.3)
18	<p>Within one month of the end of the monitoring period required by Condition (16), the consent holder shall notify the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager if the trigger values specified in Condition (17) were exceeded.</p> <p>This notification shall include the information required to be collected in Condition (20) and shall identify whether the Consent detail exceedence is likely to have resulted from wastewater discharged from the Akaroa Wastewater Treatment Plant and if so, shall detail what measures the consent holder has implemented or will implement to mitigate any adverse environmental effects as a result of the exceedence, and to prevent a reoccurrence.</p>
	Compliance
19	<p>All wastewater and receiving environment samples shall:</p> <p>a. be collected by a suitably qualified or experienced person; and</p> <p>b. be analysed at a laboratory accredited for the analyses to ISO guide 25, either by International Accreditation New Zealand (IANZ), or by an organisation with a mutual agreement with IANZ.</p>
	Compliance
20	<p>At the time the wastewater and receiving environment samples are collected, the following parameters shall be recorded;</p> <p>a. time and date of sampling and time delay between wastewater and receiving environment samples collection;</p> <p>b. the precipitation over the three consecutive days prior to sampling;</p> <p>c. the tidal state in the receiving environment at the time of sampling in the receiving environment; and</p> <p>d. wind direction and strength.</p>
	Compliance (Attachment 3.2)
21	<p>The consent holder shall submit to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, any sampling results required by this consent during each month by the 10th working day of the following month.</p>
	Compliance via this report
22	<p>The consent holder shall submit to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, an annual report prepared by a suitably qualified person by 31 August each year which includes, but is not limited to the following:</p> <p>a. Results of the monitoring undertaken in the previous year from 1 July to 30 June;</p> <p>b. An analysis of monitoring results against limits and trigger values specified in Conditions (8), (9), (13) and (17) of this consent;</p> <p>c. A comparison of monitoring results for control sites and sites on the edge of the mixing zone for parameters as specified in Conditions (15) to (17).</p> <p>d. An analysis of the extent of correlation between the receiving water monitoring results and treated wastewater monitoring results, as required in Conditions (6), (11), (12), (15) and (16). This shall include an assessment of the information collected for Condition (20), its impact on the results and any changes to the sampling regime as a result of this analysis that have been agreed with Canterbury Regional Council;</p> <p>e. Comparison of monitoring results as required in Conditions (6), (11), (12), (15) and (16) with historical data;</p> <p>f. Comparison of the monitoring results required in Conditions (6), (11), (12), (15) and (16). with operation and performance issues from the WWTP; Consent detail</p> <p>g. An interpretation of the results in relation to the effects of the discharge on the environment;</p> <p>h. Identification of any measures taken to remedy any exceedences;</p> <p>i. Details of all changes or upgrades to the treatment plant that may affect the quality or volume of treated wastewater discharged; and</p> <p>j. Summary of any inflow and/or infiltration investigations or works undertaken in the reporting period.</p>
	See below
23	<p>Copies of all monitoring results and reports relating to the discharge from the Akaroa Wastewater Treatment Plant shall be made available to the community via the Akaroa Service Centre and the Christchurch City Council website.</p>
	CCC to follow up

24	The consent holder shall submit to the Canterbury Regional Council, within six months of the grant of this consent, a management plan that details; a. measures that will be taken to ensure compliance with the consent limits specified in this consent relating to treated wastewater, as specified in Condition (8) and (9) and receiving environment microbiological parameters specified in Condition (13); and; b. Contingency measures in response to mechanical or electrical failures.
	Compliance
25	The consent shall be exercise in accordance with the management plan.
	Compliance
26	The consent holder shall achieve the following milestones within the term of this consent: a. Lodge all applications for the approvals under the Resource Management Act 1991 required to commission the new Akaroa Wastewater Treatment Plant no later than 30 June 2014; b. Award contracts for the construction of the new Wastewater Treatment Plant within eight calendar months of the commencement of the resource consents sought under clause (a) of this condition; c. Require contractors to commence construction on the site of the new Wastewater Treatment Plant within nine months of awarding the contracts under clause (b) of this condition; d. To have a fully operational new Wastewater Treatment Plant within 36 months of awarding the contracts under clause (b) of this condition.
	CCC to follow up
27	The discharge from Akaroa WWTP at or about map reference (NZMG) NZMS 260: N37: 0558-0991; (NZTM) Topo 50: BY25:9558-4831, shall cease no more than five years following the commencement of Coastal Permit CRC133179. The consent holder shall submit an annual progress report to the Canterbury Regional Council by the 31 August each year detailing progress made towards meeting the deadline for cessation of the discharge and the clauses of Condition (26).
	CCC to follow up
28	The Canterbury Regional Council may, on any of the last five working days of May or November each year, serve notice of its intention to review the conditions of this consent for the purposes of: a. dealing with any adverse effects on the environment which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage; b. requiring the adoption of the best practicable option to remove or reduce any adverse effects on the environment; requiring the consent holder to conduct monitoring instead of, or in addition to, that required by the consent; and c. complying with the requirements of a relevant rule in an operative regional plan.
	ECAN to request

Treatment Plant Effluent Monitoring

Daily flows into the Akaroa Wastewater Treatment Plant (WWTP) averaged 414m³/day. Flow recordings have resulted in exceedances over the consented volume (1500m³/day) 5 times for the Dry weather flows under CRC 202179, on all 5 occasions there was sufficient rain (50mm) to be compliant leaving 0 non-compliant days. Total annual flow through the plant was comparatively down on the previous year with 151,163.7 m³ this reporting year, the previous reporting period (i.e., 190,721 m³ in 2019-2020) and the 98.6% of all flows were less than 1500 m³/d Attachment 1.3) with a peak day flow of 3,204.4 m³ recorded on 31 May 2021.

4 Total Suspended Solids (TSS) exceedances above the 30-mg/L median limits were recorded for the period Jul20 – Jun21. Max median TSS sample was 48 mg/L. BOD₅ samples did not exceeded consent limits of 30mg/L median Limits (Table 1 & attachment 3.1).

6 single Faecal Coliform (FC) exceedances were recorded over the summer period (1Dec20 – 24Feb21), when an increased loading was received at the plant considered to coincide with the high summer seasonal holiday population (attachment 3.2).

Receiving Environment Monitoring

15.4% of samples of FC samples were >43 CFU/100mL. 7 of the 39 summer samples (5 sample median) exceeded 14 CFU/100mL FC.

Nutrient data gathered from the receiving environment exceed trigger value of 0.062mg/L at 250 metres Due North and 250m Due West of the Outfall for DIN (Attachment 3.3). The sample results were 0.068 mg/L and 0.075 mg/L respectively. 1 median exceedance was recorded.

Table 1. Summary of Monitoring Non-Compliances from July 2020-June 2021.

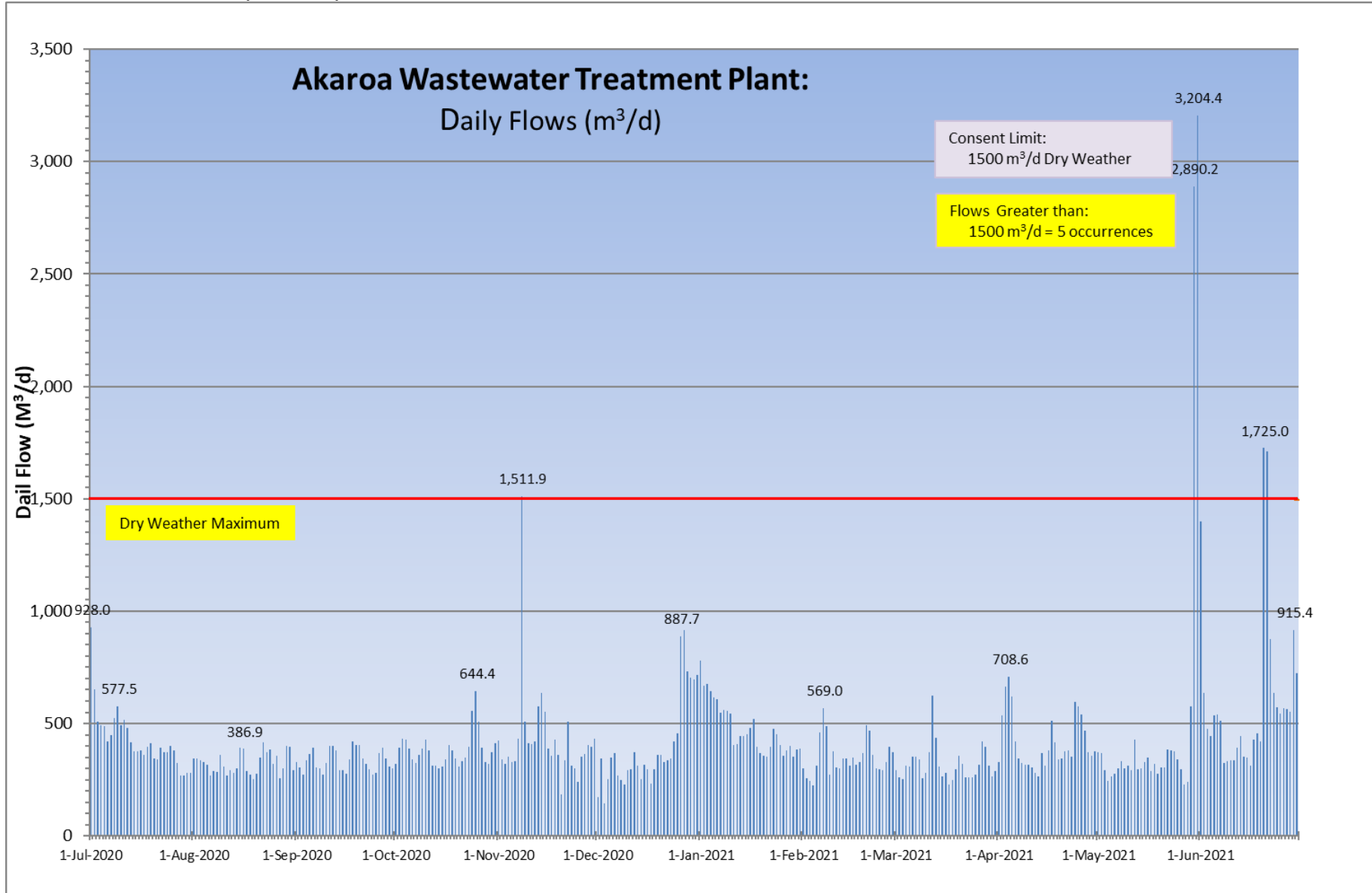
Treatment Plant Effluent			
Parameter	Single Samples Exceeding Limit	Median Limit Exceedances	Condition Non-Compliances
Dry Weather Flow > 1500 m3/d	5	-	0
BOD ₅ > 30 mg/L	0	0	4
TSS > 30 mg/L	2	4	
FC > 1,000 CFU/100 mL	3	0	0
Receiving Environment			
Parameter	Single Samples Exceeding Limit	Median Limit or % Exceedances	Condition Non-Compliances
Summer FC > 14 CFU/100 mL	10	7	7,15.4
<10% Summer FC > 43 CFU/100 mL	6	15.4	
3 Sample Median			
DIN > 0.062 mg/L (cond 17a)	2	1	1
DRP > 0.018 mg/L (cond 17b)	0	0	0
NH ₃ > 0.910 mg/L (cond 17c)	0	0	0

Attachment 1.1: Flows, Akaroa, Data

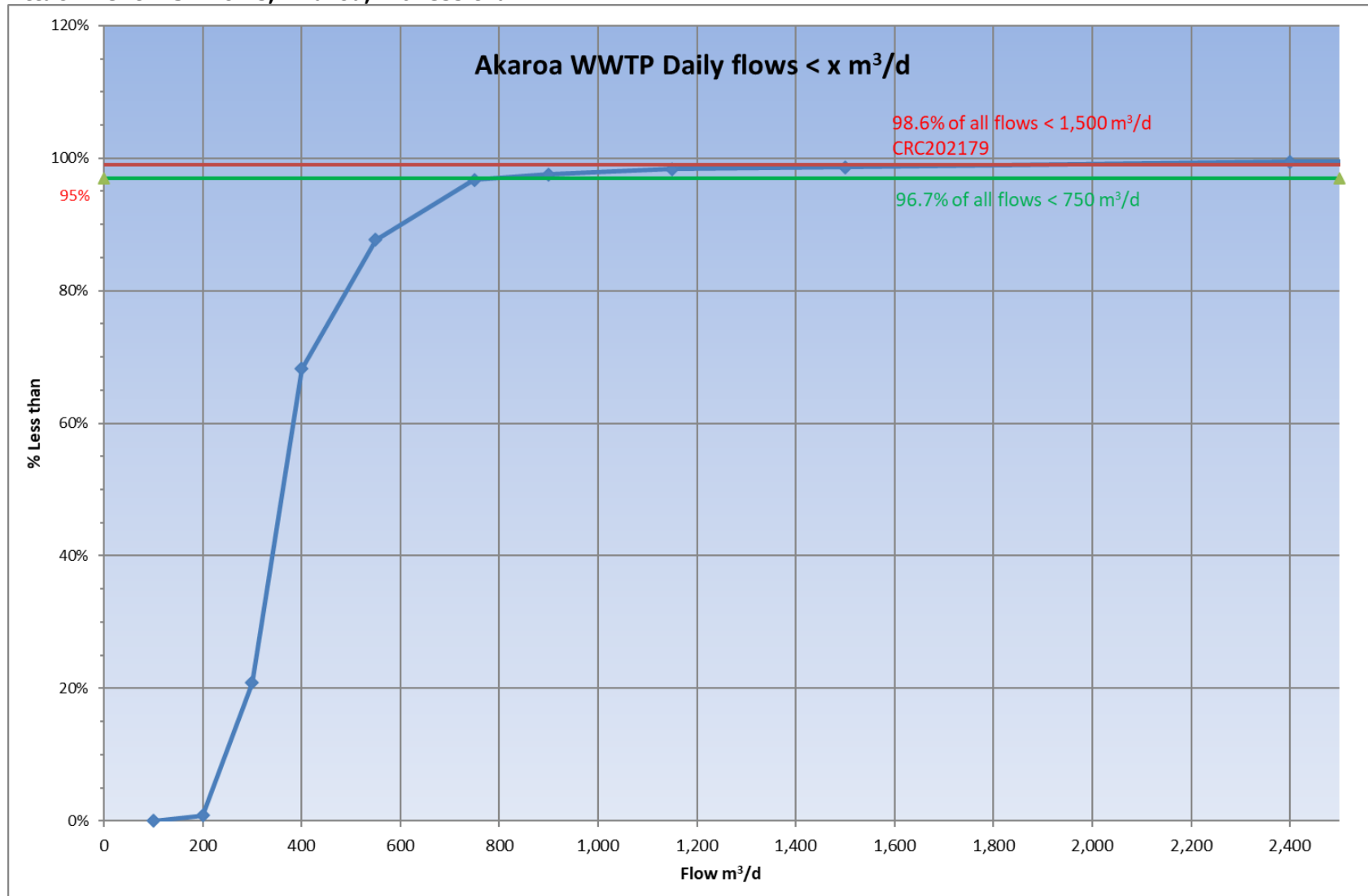
Plant		Akaroa Wastewater Treatment, Banks Peninsula: Daily Flows for July 2020 - June 2021					
Date	Flow (m ³ /d)	Date	Flow (m ³ /d)	Date	Flow (m ³ /d)	Date	Flow (m ³ /d)
1-Jul-2020	928.0	1-Oct-2020	319.8	1-Jan-2021	779.1	1-Apr-2021	327.7
2-Jul-2020	651.6	2-Oct-2020	390.6	2-Jan-2021	669.0	2-Apr-2021	535.9
3-Jul-2020	507.8	3-Oct-2020	432.1	3-Jan-2021	676.6	3-Apr-2021	662.8
4-Jul-2020	491.7	4-Oct-2020	430.1	4-Jan-2021	645.9	4-Apr-2021	708.6
5-Jul-2020	487.8	5-Oct-2020	387.8	5-Jan-2021	615.3	5-Apr-2021	618.9
6-Jul-2020	419.1	6-Oct-2020	341.8	6-Jan-2021	609.1	6-Apr-2021	420.0
7-Jul-2020	446.6	7-Oct-2020	324.4	7-Jan-2021	546.3	7-Apr-2021	343.6
8-Jul-2020	525.5	8-Oct-2020	358.3	8-Jan-2021	558.5	8-Apr-2021	322.9
9-Jul-2020	577.5	9-Oct-2020	390.0	9-Jan-2021	556.5	9-Apr-2021	314.4
10-Jul-2020	494.0	10-Oct-2020	428.8	10-Jan-2021	542.7	10-Apr-2021	315.2
11-Jul-2020	514.6	11-Oct-2020	379.9	11-Jan-2021	405.1	11-Apr-2021	305.3
12-Jul-2020	482.0	12-Oct-2020	312.9	12-Jan-2021	407.8	12-Apr-2021	280.6
13-Jul-2020	414.4	13-Oct-2020	313.2	13-Jan-2021	442.5	13-Apr-2021	264.2
14-Jul-2020	376.9	14-Oct-2020	299.0	14-Jan-2021	442.8	14-Apr-2021	370.2
15-Jul-2020	375.8	15-Oct-2020	308.4	15-Jan-2021	453.1	15-Apr-2021	313.8
16-Jul-2020	379.8	16-Oct-2020	340.4	16-Jan-2021	482.0	16-Apr-2021	381.8
17-Jul-2020	361.4	17-Oct-2020	406.2	17-Jan-2021	518.2	17-Apr-2021	511.9
18-Jul-2020	395.2	18-Oct-2020	380.3	18-Jan-2021	398.0	18-Apr-2021	416.9
19-Jul-2020	413.7	19-Oct-2020	344.6	19-Jan-2021	366.8	19-Apr-2021	340.6
20-Jul-2020	344.5	20-Oct-2020	307.9	20-Jan-2021	354.8	20-Apr-2021	346.1
21-Jul-2020	341.5	21-Oct-2020	332.8	21-Jan-2021	350.4	21-Apr-2021	374.9
22-Jul-2020	391.9	22-Oct-2020	347.4	22-Jan-2021	394.3	22-Apr-2021	381.2
23-Jul-2020	373.4	23-Oct-2020	397.8	23-Jan-2021	477.4	23-Apr-2021	353.2
24-Jul-2020	372.6	24-Oct-2020	557.3	24-Jan-2021	453.7	24-Apr-2021	596.8
25-Jul-2020	398.7	25-Oct-2020	644.4	25-Jan-2021	405.3	25-Apr-2021	576.2
26-Jul-2020	379.3	26-Oct-2020	507.8	26-Jan-2021	357.4	26-Apr-2021	540.6
27-Jul-2020	323.8	27-Oct-2020	390.7	27-Jan-2021	379.4	27-Apr-2021	469.4
28-Jul-2020	270.1	28-Oct-2020	327.1	28-Jan-2021	401.2	28-Apr-2021	371.6
29-Jul-2020	268.3	29-Oct-2020	319.6	29-Jan-2021	353.8	29-Apr-2021	358.0
30-Jul-2020	279.2	30-Oct-2020	373.7	30-Jan-2021	385.2	30-Apr-2021	375.5
31-Jul-2020	280.3	31-Oct-2020	412.8	31-Jan-2021	389.1	1-May-2021	372.5
1-Aug-2020	342.7	1-Nov-2020	425.5	1-Feb-2021	300.6	2-May-2021	370.0
2-Aug-2020	344.6	2-Nov-2020	340.2	2-Feb-2021	257.9	3-May-2021	293.4
3-Aug-2020	336.4	3-Nov-2020	318.9	3-Feb-2021	244.3	4-May-2021	242.6
4-Aug-2020	327.8	4-Nov-2020	353.1	4-Feb-2021	222.7	5-May-2021	263.1
5-Aug-2020	317.2	5-Nov-2020	328.8	5-Feb-2021	312.3	6-May-2021	274.7
6-Aug-2020	269.4	6-Nov-2020	333.5	6-Feb-2021	460.2	7-May-2021	301.0
7-Aug-2020	290.0	7-Nov-2020	431.5	7-Feb-2021	569.0	8-May-2021	333.9
8-Aug-2020	284.1	8-Nov-2020	1,511.9	8-Feb-2021	487.4	9-May-2021	301.5
9-Aug-2020	361.6	9-Nov-2020	508.0	9-Feb-2021	273.8	10-May-2021	313.2
10-Aug-2020	307.0	10-Nov-2020	413.3	10-Feb-2021	378.2	11-May-2021	291.8
11-Aug-2020	269.3	11-Nov-2020	406.5	11-Feb-2021	302.8	12-May-2021	428.2
12-Aug-2020	293.8	12-Nov-2020	419.2	12-Feb-2021	300.9	13-May-2021	296.3
13-Aug-2020	279.6	13-Nov-2020	574.6	13-Feb-2021	342.5	14-May-2021	301.1
14-Aug-2020	299.5	14-Nov-2020	637.9	14-Feb-2021	344.8	15-May-2021	327.1
15-Aug-2020	393.7	15-Nov-2020	553.4	15-Feb-2021	312.2	16-May-2021	349.8
16-Aug-2020	386.9	16-Nov-2020	389.2	16-Feb-2021	348.3	17-May-2021	287.6
17-Aug-2020	287.1	17-Nov-2020	355.5	17-Feb-2021	314.8	18-May-2021	321.2
18-Aug-2020	274.0	18-Nov-2020	427.2	18-Feb-2021	327.5	19-May-2021	277.5

Plant		Akaroa Wastewater Treatment, Banks Peninsula: Daily Flows for July 2020 - June 2021					
Date	Flow (m ³ /d)	Date	Flow (m ³ /d)	Date	Flow (m ³ /d)	Date	Flow (m ³ /d)
19-Aug-2020	254.0	19-Nov-2020	360.0	19-Feb-2021	368.0	20-May-2021	302.6
20-Aug-2020	276.2	20-Nov-2020	186.0	20-Feb-2021	491.7	21-May-2021	303.3
21-Aug-2020	348.1	21-Nov-2020	335.4	21-Feb-2021	467.2	22-May-2021	385.3
22-Aug-2020	416.2	22-Nov-2020	507.8	22-Feb-2021	360.3	23-May-2021	379.4
23-Aug-2020	373.0	23-Nov-2020	313.3	23-Feb-2021	301.5	24-May-2021	376.0
24-Aug-2020	385.8	24-Nov-2020	298.5	24-Feb-2021	294.5	25-May-2021	339.6
25-Aug-2020	320.1	25-Nov-2020	241.4	25-Feb-2021	294.4	26-May-2021	298.0
26-Aug-2020	356.7	26-Nov-2020	351.1	26-Feb-2021	327.9	27-May-2021	228.8
27-Aug-2020	257.7	27-Nov-2020	366.3	27-Feb-2021	394.3	28-May-2021	239.8
28-Aug-2020	301.2	28-Nov-2020	403.4	28-Feb-2021	373.5	29-May-2021	577.8
29-Aug-2020	401.5	29-Nov-2020	397.2	1-Mar-2021	291.5	30-May-2021	2,890.2
30-Aug-2020	398.2	30-Nov-2020	430.7	2-Mar-2021	259.4	31-May-2021	3,204.4
31-Aug-2020	290.5	1-Dec-2020	172.4	3-Mar-2021	252.8	1-Jun-2021	1,399.1
1-Sep-2020	327.0	2-Dec-2020	345.2	4-Mar-2021	311.3	2-Jun-2021	635.6
2-Sep-2020	303.3	3-Dec-2020	144.9	5-Mar-2021	307.5	3-Jun-2021	475.4
3-Sep-2020	271.7	4-Dec-2020	251.5	6-Mar-2021	353.1	4-Jun-2021	446.0
4-Sep-2020	336.0	5-Dec-2020	347.1	7-Mar-2021	354.2	5-Jun-2021	537.8
5-Sep-2020	364.1	6-Dec-2020	366.5	8-Mar-2021	339.9	6-Jun-2021	542.1
6-Sep-2020	392.7	7-Dec-2020	269.4	9-Mar-2021	256.0	7-Jun-2021	512.7
7-Sep-2020	305.3	8-Dec-2020	247.6	10-Mar-2021	278.9	8-Jun-2021	323.8
8-Sep-2020	300.8	9-Dec-2020	227.6	11-Mar-2021	372.0	9-Jun-2021	333.8
9-Sep-2020	272.2	10-Dec-2020	292.7	12-Mar-2021	625.3	10-Jun-2021	334.7
10-Sep-2020	323.1	11-Dec-2020	295.9	13-Mar-2021	435.3	11-Jun-2021	337.8
11-Sep-2020	401.4	12-Dec-2020	373.4	14-Mar-2021	309.7	12-Jun-2021	393.2
12-Sep-2020	398.9	13-Dec-2020	313.0	15-Mar-2021	264.9	13-Jun-2021	443.0
13-Sep-2020	380.5	14-Dec-2020	253.7	16-Mar-2021	280.6	14-Jun-2021	352.0
14-Sep-2020	291.2	15-Dec-2020	317.6	17-Mar-2021	228.3	15-Jun-2021	347.1
15-Sep-2020	292.6	16-Dec-2020	296.8	18-Mar-2021	248.4	16-Jun-2021	314.4
16-Sep-2020	277.5	17-Dec-2020	231.8	19-Mar-2021	296.2	17-Jun-2021	427.5
17-Sep-2020	341.0	18-Dec-2020	297.8	20-Mar-2021	356.1	18-Jun-2021	456.8
18-Sep-2020	421.5	19-Dec-2020	361.6	21-Mar-2021	321.5	19-Jun-2021	420.2
19-Sep-2020	405.2	20-Dec-2020	362.0	22-Mar-2021	260.3	20-Jun-2021	1,725.0
20-Sep-2020	403.4	21-Dec-2020	327.0	23-Mar-2021	262.2	21-Jun-2021	1,712.3
21-Sep-2020	344.8	22-Dec-2020	335.5	24-Mar-2021	259.3	22-Jun-2021	876.4
22-Sep-2020	319.0	23-Dec-2020	345.5	25-Mar-2021	274.1	23-Jun-2021	634.2
23-Sep-2020	294.5	24-Dec-2020	420.9	26-Mar-2021	317.5	24-Jun-2021	570.4
24-Sep-2020	272.8	25-Dec-2020	454.6	27-Mar-2021	421.3	25-Jun-2021	545.2
25-Sep-2020	280.9	26-Dec-2020	887.7	28-Mar-2021	394.8	26-Jun-2021	569.0
26-Sep-2020	369.3	27-Dec-2020	916.4	29-Mar-2021	313.5	27-Jun-2021	565.3
27-Sep-2020	392.0	28-Dec-2020	730.1	30-Mar-2021	266.3	28-Jun-2021	552.4
28-Sep-2020	344.7	29-Dec-2020	703.7	31-Mar-2021	288.7	29-Jun-2021	915.4
29-Sep-2020	308.7	30-Dec-2020	696.9			30-Jun-2021	725.0
30-Sep-2020	300.8	31-Dec-2020	715.4				

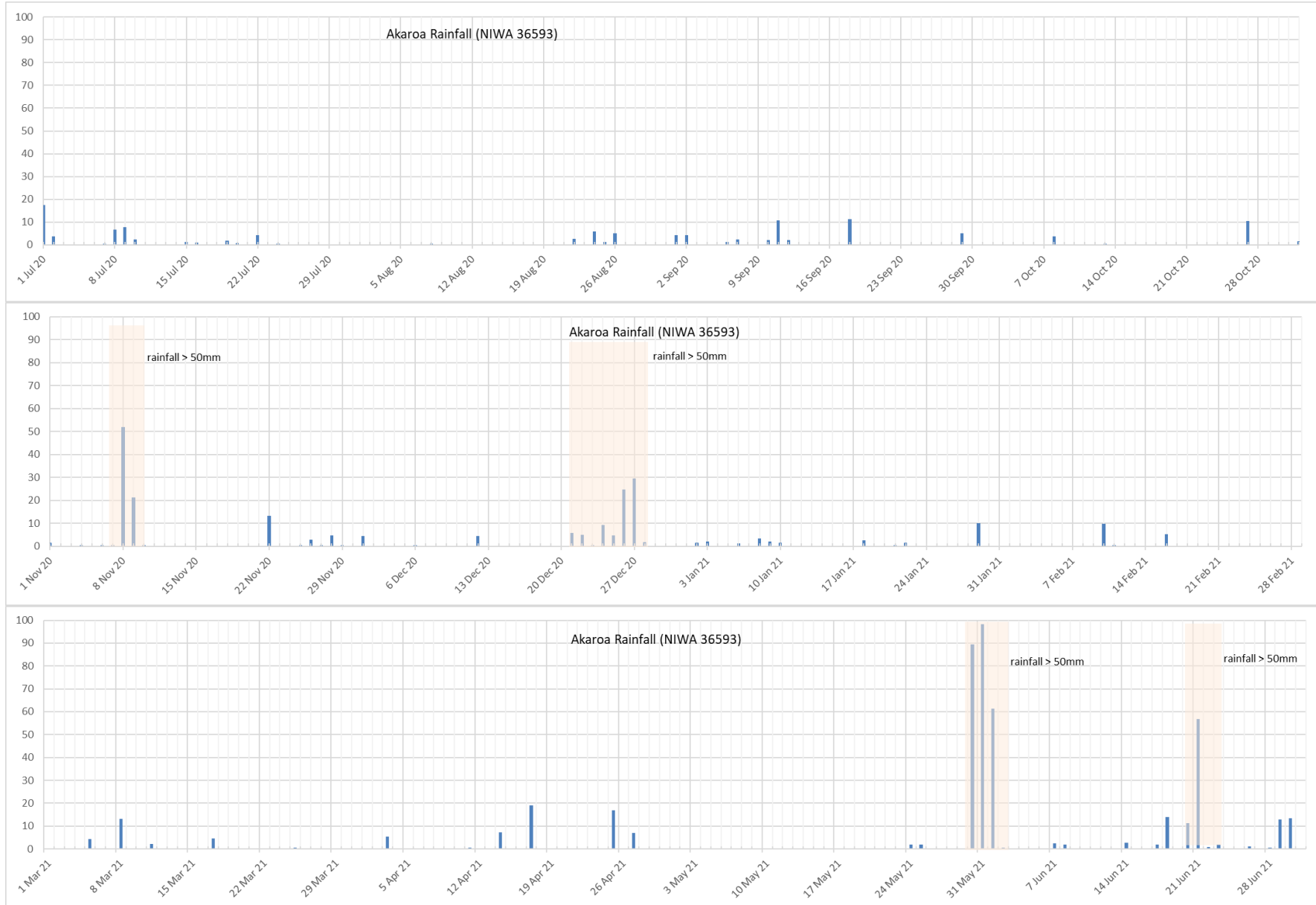
Attachment 1.2: Flows, Akaroa, Chart



Attachment 1.3: Flows, Akaroa, '% less than'



Attachment 2.1: Rainfall data



Attachment 3.1: Lab Data, Akaroa Wastewater Treatment Plant (Conditions 6-10)

Plant:	Akaroa Wastewater Treatment, Banks Peninsula												
Asset Owner:	Christchurch City Council												
Laboratory	Christchurch City Council Laboratory, City Water & Waste Unit												
						calc					5-Sample Median		
Date	NH ₄ -N [mg/l]	BOD ₅ [mg/l]	ENT MPN/100ml	FC CFU/100ml	Temp [deg C]	NOx [mg/l]	DRP [mg/l]	TP [mg/l]	TSS [mg/l]	TN [mg/l]	BOD ₅ [mg/l]	TSS [mg/l]	FC CFU/100ml
9-Jul-20	13	13	10	10	10.3	13	1.2	2.8	48	8.3	13.0	42	10
4-Aug-20	4.7	27	10	10	NA	5.1	2.5	4.9	72	20	13.0	48	10
3-Sep-20	20	4	10	10	11.9	21	2.4	3.5	27	9.1	13.0	48	10
6-Oct-20	4.6	15	190	1,300	NA	5.6	4.2	4.9	20	29	15.0	48	10
5-Nov-20	6.2	10	10	20	NA	6.7	3.3	3.4	20	16	13.0	27	10
1-Dec-20	3.4	15	10	70	16.0	5.1	1.9	2.9	24	16	15.0	24	20
9-Dec-20	14	12	10	10	19.6	15	3.3	4.1	18	18	12.0	20	20
16-Dec-20	13	18	300	1,200	20.2	15	3.1	4.1	3	15	15.0	20	70
23-Dec-20	16	8.7	10	10	19.7	16	3.7	3.8	13	13	12.0	18	20
30-Dec-20	1.4	19	2400	6,200	18.8	4	3.5	4.7	24	32	15.0	18	70
6-Jan-21	0.41	18	130	440	20.4	1.3	5	5.3	22	39	18.0	18	440
13-Jan-21	7.1	9.8	20	50	20.0	7.6	3.8	4.4	21	25	18.0	21	440
20-Jan-21	14	13	75	60	19.5	15	3.4	3.9	22	16	13.0	22	60
27-Jan-21	13	6.6	10	20	21.9	14	2.9	3.3	19	9.4	13.0	22	60
3-Feb-21	20	7.3	30	10	19.9	21	3.5	3.7	13	7.8	9.8	21	50
10-Feb-21	13	11	98	100	22.0	15	4.9	5.1	20	14	9.8	20	50
17-Feb-21	23	10	10	70	19.0	24	2.3	2.9	19	5	10.0	19	60
24-Feb-21	26	6.2	10	10	20.0	27	3	3.2	15	5.5	7.3	19	20
4-Mar-21	23	4.9	10	10	15.0	24	3.8	3.9	9.9	4.9	7.3	15	10
9-Apr-21	28	9.7	20	10	18.7	29	3.7	4	15	6.1	9.7	15	10
6-May-21	27	10	10	10	15.6	27	2.7	3.1	11	3.6	9.7	15	10
24-Jun-21	13	7.3	31	10	11.7	13	0.78	0.98	18	2.6	7.3	15	10
	single	0		3					2	Limit	30	30	1,000
									Exceedances		0	4	0
									Max		18.0	48.0	440
Date	Cd [mg/l]	Cr [mg/l]	Cu [mg/l]	Pb [mg/l]	Zn [mg/l]								
6 Jan 2016	<0.00020	<0.001	0.013	<0.0015	0.045								
4 Jan 2017	0.019	0.0024	0.032	0.0033	0.095								
3 Jan 2018	0.0010	0.0010	0.0069	0.0010	0.042								
3 Jan 2019	<0.0010	<0.0010	0.013	0.0010	0.063								
3 Jan 2020	<0.0010	<0.0010	0.0120	<0.0010	0.048								
6 Jan 2021	<0.0010	<0.0010	0.0078	<0.0010	0.057								

Attachment 3.1: Lab Data, Akaroa Wastewater Treatment Plant (Conditions 6-10)

Attachment 3.2: Lab Data, Receiving Environment (Condition 11-14 and 20)

Akaroa STP CRC202179 11-14 & 20	STP Sample Time	400m Shoreline North	400m Shoreline South	Shoreline nearest OF	400m Shoreline North	400m Shoreline South	Shoreline nearest OF	400m Shoreline North		400m Shoreline South		Shoreline nearest Outfall					
		ENT	ENT	ENT	FC	FC	FC	Sample Time	Time between samples taken from STP & RCV	Sample Time	Time between samples taken from STP & RCV	Sample Time	Time between samples taken from STP & RCV				
		MPN/100ml	MPN/100ml	MPN/100ml	CFU/100ml	CFU/100ml	CFU/100ml										
9 Jul 2020	9:45				76	53	70	10:01	0:16	9:51	0:06	9:56	0:11				
4 Aug 2020	9:15				2	1	1	9:25	0:10	9:30	0:15	9:35	0:20				
3 Sep 2020	9:25				1	1	1	9:10	0:15	9:20	0:05	9:15	0:10	5 sample median			
6 Oct 2020	9:26	20	10	10	220	260	230	9:20	0:06	9:40	0:14	9:30	0:04	N	S	OF	
5 Nov 2020	7:45				43	1	2	8:05	0:20	7:55	0:10	8:00	0:15	FC	FC	FC	
1 Dec 2020	8:20	10	10	10	1	2	2	8:25	0:05	8:35	0:15	8:30	0:10		2	1	2
9 Dec 2020	7:30	10	10	10	3	1	6	7:35	0:05	7:45	0:15	7:40	0:10		3	1	2
16 Dec 2020	4:50	10	10	10	8	3	58	4:35	0:15	9:45	4:55	9:40	4:50		8	2	6
23 Dec 2020	7:25	10	10	10	2	3	1	7:35	0:10	7:50	0:25	7:45	0:20		3	2	2
30 Dec 2020	7:40	10	10	10	46	1	34	7:30	0:10	7:40	0:00	7:35	0:05		3	2	6
6 Jan 2021	7:35	10	10	20	3	1	140	7:10	0:25	7:20	0:15	7:15	0:20		3	1	34
13 Jan 2021	7:25	41	10	31	79	15	72	7:20	0:05	7:30	0:05	7:25	0:00		8	3	58
20 Jan 2021	7:45	62	73	110	33	33	44	7:40	0:05	7:30	0:15	7:35	0:10		33	3	44
27 Jan 2021	7:40	10	10	10	3	1	1	7:20	0:20	7:30	0:10	7:25	0:15		33	1	44
3 Feb 2021	7:30	220	10	10	3	1	3	7:05	0:25	7:15	0:15	7:10	0:20		3	1	44
10 Feb 2021	8:20	10	10	10	3	1	1	8:15	0:05	8:25	0:05	8:20	0:00		3	1	3
17 Feb 2021	10:30	10	10	10	1	1	1	10:50	0:20	10:45	0:15	10:40	0:10		3	1	1
24 Feb 2021	8:15	10	10	10	1	1	1	8:20	0:05	8:30	0:15	8:25	0:10		3	1	1
4 Mar 2021	7:30				1	1	1	7:25	0:05	7:15	0:15	7:20	0:10				
9 Apr 2021	10:10				2	1	1	10:15	0:05	10:25	0:15	10:20	0:10				39
6 May 2021	9:15				1	2	1	9:20	0:05	9:30	0:15	9:25	0:10				
24 Jun 2021	8:40				10	10	10	8:25	0:15	8:35	0:05	8:30	0:10				
summer FC singles > 14					3	2	5	10									
5 sample median of Summer samples >14 (Condition 13a)					2	0	5	7									
# summer samples > 43 (cond 13b)					2	0	4										
% summer samples > 43					15.4%	0.0%	30.8%										
# total samples > 43 (Cond 13b)					2	1	1	2	0	4	6						
% total samples > 43					5.1%	2.6%	2.6%	5.1%	0.0%	10.3%							
# all summer samples > 43 (cond 13b)																	6
% all summer samples > 43																	15.4

Attachment 3.3: Lab Data, Receiving Environment (Conditions 15-18)

Date	250 metres due North								250 metres due West								250 metres due South								Condition 17 3 Sample Median		
	Temp °C	TN mg/L	NOx mg/L	NH3 mg/L	DIN mg/L	TP mg/L	DRP mg/L	Chla ug/L	Temp °C	TN mg/L	NOx mg/L	NH3 mg/L	DIN mg/L	TP mg/L	DRP mg/L	Chla ug/L	Temp °C	TN mg/L	NOx mg/L	NH3 mg/L	DIN mg/L	TP mg/L	DRP mg/L	Chla ug/L	NH3 mg/L	DIN mg/L	DRP mg/L
	TRIGGER				0.910	0.062		0.018					0.910	0.062		0.018					0.910	0.062		0.018		0.910	0.062
9-Dec-20	16.1	0.21	0.010	0.009	0.019	0.043	0.007	3.5	16.1	0.20	0.010	0.008	0.018	0.035	0.006	3.1	16.1	0.19	0.010	0.008	0.018	0.037	0.006	2.9	0.008	0.018	0.006
30-Dec-20	16.7	0.15	0.010	0.005	0.015	0.033	0.005	2.1	16.7	0.11	0.010	0.007	0.017	0.031	0.009	1.8	16.7	0.15	0.010	0.008	0.018	0.032	0.005	2	0.007	0.017	0.005
13-Jan-21	16.9	0.25	0.014	0.005	0.019	0.021	0.008	2.1	16.9	0.23	0.014	0.005	0.019	0.018	0.008	1.9	16.9	0.27	0.010	0.005	0.015	0.022	0.008	2	0.005	0.019	0.008
3-Feb-21	17.2	0.26	0.063	0.005	0.068	0.026	0.013	3.2	17.2	0.40	0.064	0.011	0.075	0.025	0.012	2.8	17.2	0.3	0.035	0.005	0.040	0.026	0.012	3	0.005	0.068	0.012

Date	Plant Effluent						French Bay								New Outfall							
	Temp °C	TN mg/L	NOx mg/L	NH3 mg/L	TP mg/L	DRP mg/L	Temp °C	TN mg/L	NOx mg/L	NH3 mg/L	DIN mg/L	TP mg/L	DRP mg/L	Chla ug/L	Temp °C	TN mg/L	NOx mg/L	NH3 mg/L	DIN mg/L	TP mg/L	DRP mg/L	Chla ug/L
TRIGGER										0.910	0.062		0.018					0.910	0.062		0.018	
9-Dec-20	19.6	18	15.00	16	4.1	3.3	16.1	0.26	0.014	0.007	0.021	0.032	0.006	2.7	16.1	0.18	0.012	0.0076	0.020	0.030	0.005	2.1
30-Dec-20	18.8	32	4.00	31	4.7	3.5	16.7	0.17	0.010	0.007	0.017	0.034	0.006	1.3	16.7	0.17	0.010	0.0076	0.018	0.030	0.007	1.7
13-Jan-21	20.0	25	7.60	23	4.4	3.8	16.9	0.30	0.012	0.005	0.017	0.018	0.007	1.2	16.9	0.24	0.016	0.0050	0.021	0.018	0.008	1.8
3-Feb-21	19.9	7.8	21.00	4.9	3.7	3.5	17.2	0.29	0.026	0.005	0.031	0.027	0.009	2.6	17.2	0.25	0.031	0.0050	0.036	0.024	0.011	4.7

Attachment 3.3: Lab Data, Receiving Environment (Conditions 15-18)