AKAROA
WASTEWATER TREATMENT PLANT
CRC204086

Annual Monitoring Report
1 July 2021 – 30 June 2022.

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31/08/2022

Christchurch City Council

Introduction

This is first Annual Report that has been complied since the newly formed Banks Peninsula Treatment Team took charge of the Akaroa Wastewater Treatment Plant, on the 22nd November 2021.

The outgoing contractors, Citycare Ltd, had been responsible for the plant since 2009 and they unfortunately left without time to conduct a thorough handover. We have been busy this past year with getting up to speed with the operation of all the Wastewater treatment plants on the peninsula, and going forward into this year, we are excited to have the time to plan for the influx of holiday makers this summer season.

Compliance with the Resource Consent Conditions

1. The discharge shall be only treated wastewater from the Akaroa Wastewater Treatment Plant, located at 301 Beach Road, Red House Bay, Akaroa, at or about map reference NZTM: 1595704 mE, 5148261 mN, as shown on the attached Plan CRC204086, which forms part of this resource consent. **Complies.**

2. Treated wastewater from the Akaroa Wastewater Treatment Plant shall be discharged at or about map reference NZTM 1595566 mE, 5148312 mN, into Akaroa Harbour via the existing 100 metre long submerged outfall, as shown on Plan CRC204086. **Complies.**.

3. a. Warning notices, which can be read from a distance of five metres, shall be maintained at the following locations:

i. At the terminus of Beach Road closest to the wastewater treatment plant; and

ii. Beside Beach Road adjacent to the rocks that lead out to Green Point.

   b. The warning notices shall advise the public of the existence of a wastewater outfall and the potential risk of swimming in the area or eating shellfish collected in that location. **Complies.**

4. The volume of wastewater discharged from the Akaroa Wastewater Treatment Plant shall be continuously recorded using a flow meter. The readings from the flow meter shall be recorded in cubic metres per hour 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). **Complies (Attachment 1.1)**

5. The volume of treated wastewater discharged must not exceed 1,500 cubic metres per day, except during rainfall events of a total of 30 millimetres or more over three consecutive days.

Advice 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-Compliance. The limit of 1500 m3/d was only exceeded on one occasion (3/08/2021) during a rain event that exceeded 30 mm (44 mm/d) in one day. Attachment 1.2, 1.3, 1.4.**

Plant		Akaroa WWTP, Banks Peninsula: Daily Flows for July 2021 - June 2022.									
Date	Flow (m3/d)	Date	Flow (m3/d	Date	Flow (m3/d)	Date	Flow (m3/d)	Date	Flow (m3/d)	Date	Flow (m3/d)
1/07/2021	564	1/09/2021	236	1/11/2021	392	1/01/2022	884	1/03/2022	303	1/05/2022	598
2/07/2021	477	2/09/2021	269	2/11/2021	315	2/01/2022	866	2/03/2022	376	2/05/2022	545
3/07/2021	504	3/09/2021	265	3/11/2021	331	3/01/2022	886	3/03/2022	387	3/05/2022	564
4/07/2021	486	4/09/2021	301	4/11/2021	360	4/01/2022	863	4/03/2022	333	4/05/2022	580
5/07/2021	398	5/09/2021	241	5/11/2021	359	5/01/2022	793	5/03/2022	412	5/05/2022	615
6/07/2021	387	6/09/2021	270	6/11/2021	426	6/01/2022	691	6/03/2022	381	6/05/2022	572
7/07/2021	495	7/09/2021	259	7/11/2021	408	7/01/2022	654	7/03/2022	330	7/05/2022	575
8/07/2021	428	8/09/2021	454	8/11/2021	329	8/01/2022	735	8/03/2022	307	8/05/2022	561
9/07/2021	691	9/09/2021	352	9/11/2021	323	9/01/2022	704	9/03/2022	337	9/05/2022	569
10/07/2021	681	10/09/2021	405	10/11/2021	352	10/01/2022	587	10/03/2022	362	10/05/2022	533
11/07/2021	539	11/09/2021	455	11/11/2021	423	11/01/2022	589	11/03/2022	406	11/05/2022	524
12/07/2021	443	12/09/2021	455	12/11/2021	609	12/01/2022	553	12/03/2022	513	12/05/2022	507
13/07/2021	432	13/09/2021	349	13/11/2021	667	13/01/2022	494	13/03/2022	481	13/05/2022	537
14/07/2021	389	14/09/2021	463	14/11/2021	641	14/01/2022	507	14/03/2022	441	14/05/2022	628
15/07/2021	415	15/09/2021	336	15/11/2021	600	15/01/2022	522	15/03/2022	384	15/05/2022	627
16/07/2021	443	16/09/2021	338	16/11/2021	459	16/01/2022	500	16/03/2022	441	16/05/2022	621
17/07/2021	520	17/09/2021	354	17/11/2021	489	17/01/2022	420	17/03/2022	354	17/05/2022	599
18/07/2021	519	18/09/2021	420	18/11/2021	403	18/01/2022	428	18/03/2022	368	18/05/2022	618
19/07/2021	616	19/09/2021	392	19/11/2021	469	19/01/2022	496	19/03/2022	483	19/05/2022	616
20/07/2021	457	20/09/2021	342	20/11/2021	643	20/01/2022	526	20/03/2022	455	20/05/2022	685
21/07/2021	606	21/09/2021	311	21/11/2021	481	21/01/2022	501	21/03/2022	444	21/05/2022	645
22/07/2021	832	22/09/2021	327	22/11/2021	403	22/01/2022	557	22/03/2022	1167	22/05/2022	598
23/07/2021	536	23/09/2021	293	23/11/2021	464	23/01/2022	499	23/03/2022	539	23/05/2022	627
24/07/2021	467	24/09/2021	373	24/11/2021	505	24/01/2022	431	24/03/2022	501	24/05/2022	571
25/07/2021	438	25/09/2021	470	25/11/2021	435	25/01/2022	427	25/03/2022	485	25/05/2022	533
26/07/2021	451	26/09/2021	489	26/11/2021	675	26/01/2022	485	26/03/2022	575	26/05/2022	542
27/07/2021	539	27/09/2021	327	27/11/2021	671	27/01/2022	516	27/03/2022	533	27/05/2022	516
28/07/2021	405	28/09/2021	325	28/11/2021	676	28/01/2022	403	28/03/2022	457	28/05/2022	604
29/07/2021	371	29/09/2021	328	29/11/2021	394	29/01/2022	431	29/03/2022	443	29/05/2022	622
30/07/2021	341	30/09/2021	352	30/11/2021	340	30/01/2022	444	30/03/2022	509	30/05/2022	533
31/07/2021	390					31/01/2022	386	31/03/2022	482	31/05/2022	546
		1/10/2021	344	1/12/2021	296						
1/08/2021	342	2/10/2021	457	2/12/2021	349	1/02/2022	406	1/04/2022	469	1/06/2022	513
2/08/2021	311	3/10/2021	469	3/12/2021	351	2/02/2022	418	2/04/2022	504	2/06/2022	489
3/08/2021	1776	4/10/2021	616	4/12/2021	483	3/02/2022	380	3/04/2022	484	3/06/2022	644
4/08/2021	801	5/10/2021	449	5/12/2021	546	4/02/2022	413	4/04/2022	429	4/06/2022	633
5/08/2021	629	6/10/2021	368	6/12/2021	533	5/02/2022	629	5/04/2022	398	5/06/2022	720
6/08/2021	669	7/10/2021	398	7/12/2021	409	6/02/2022	672	6/04/2022	395	6/06/2022	653
7/08/2021	604	8/10/2021	472	8/12/2021	249	7/02/2022	547	7/04/2022	474	7/06/2022	467
8/08/2021	584	9/10/2021	555	9/12/2021	382	8/02/2022	439	8/04/2022	532	8/06/2022	436
9/08/2021	497	10/10/2021	529	10/12/2021	342	9/02/2022	456	9/04/2022	593	9/06/2022	442
10/08/2021	432	11/10/2021	453	11/12/2021	444	10/02/2022	616	10/04/2022	598	10/06/2022	497
11/08/2021	382	12/10/2021	762	12/12/2021	414	11/02/2022	440	11/04/2022	527	11/06/2022	529
12/08/2021	370	13/10/2021	989	13/12/2021	330	12/02/2022	685	12/04/2022	508	12/06/2022	558
13/08/2021	473	14/10/2021	635	14/12/2021	330	13/02/2022	1468	13/04/2022	519	13/06/2022	611
14/08/2021	574	15/10/2021	599	15/12/2021	1302	14/02/2022	642	14/04/2022	566	14/06/2022	581
15/08/2021	527	16/10/2021	606	16/12/2021	1175	15/02/2022	517	15/04/2022	774	15/06/2022	657
16/08/2021	420	17/10/2021	495	17/12/2021	759	16/02/2022	460	16/04/2022	917	16/06/2022	634
17/08/2021	404	18/10/2021	343	18/12/2021	800	17/02/2022	481	17/04/2022	935	17/06/2022	601
18/08/2021	427	19/10/2021	301	19/12/2021	610	18/02/2022	493	18/04/2022	849	18/06/2022	633
19/08/2021	372	20/10/2021	317	20/12/2021	558	19/02/2022	516	19/04/2022	685	19/06/2022	655
20/08/2021	513	21/10/2021	301	21/12/2021	525	20/02/2022	485	20/04/2022	637	20/06/2022	670
21/08/2021	372	22/10/2021	397	22/12/2021	437	21/02/2022	430	21/04/2022	686	21/06/2022	545
22/08/2021	343	23/10/2021	598	23/12/2021	434	22/02/2022	416	22/04/2022	744	22/06/2022	554
23/08/2021	342	24/10/2021	708	24/12/2021	430	23/02/2022	350	23/04/2022	780	23/06/2022	565
24/08/2021	310	25/10/2021	605	25/12/2021	427	24/02/2022	294	24/04/2022	866	24/06/2022	710
25/08/2021	323	26/10/2021	402	26/12/2021	625	25/02/2022	388	25/04/2022	796	25/06/2022	815
26/08/2021	304	27/10/2021	373	27/12/2021	721	26/02/2022	551	26/04/2022	652	26/06/2022	736
27/08/2021	368	28/10/2021	352	28/12/2021	736	27/02/2022	479	27/04/2022	594	27/06/2022	639
28/08/2021	352	29/10/2021	413	29/12/2021	732	28/02/2022	414	28/04/2022	537	28/06/2022	779
29/08/2021	345	30/10/2021	461	30/12/2021	794			29/04/2022	566	29/06/2022	636
30/08/2021	299	31/10/2021	458	31/12/2021	797			30/04/2022	581	30/06/2022	556
31/08/2021	280										

Attachment 1.1, Daily Flow Akaroa WWTP

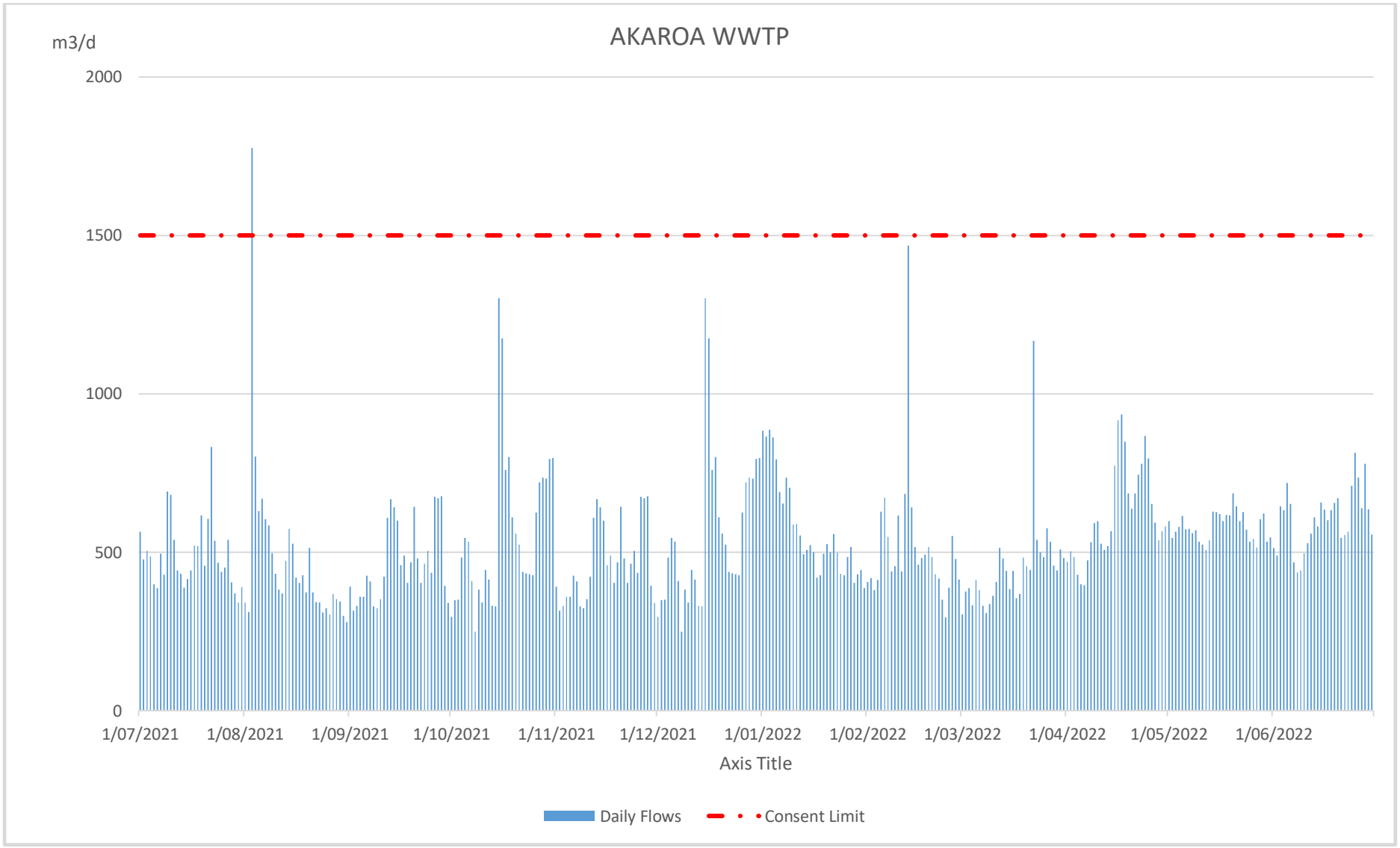
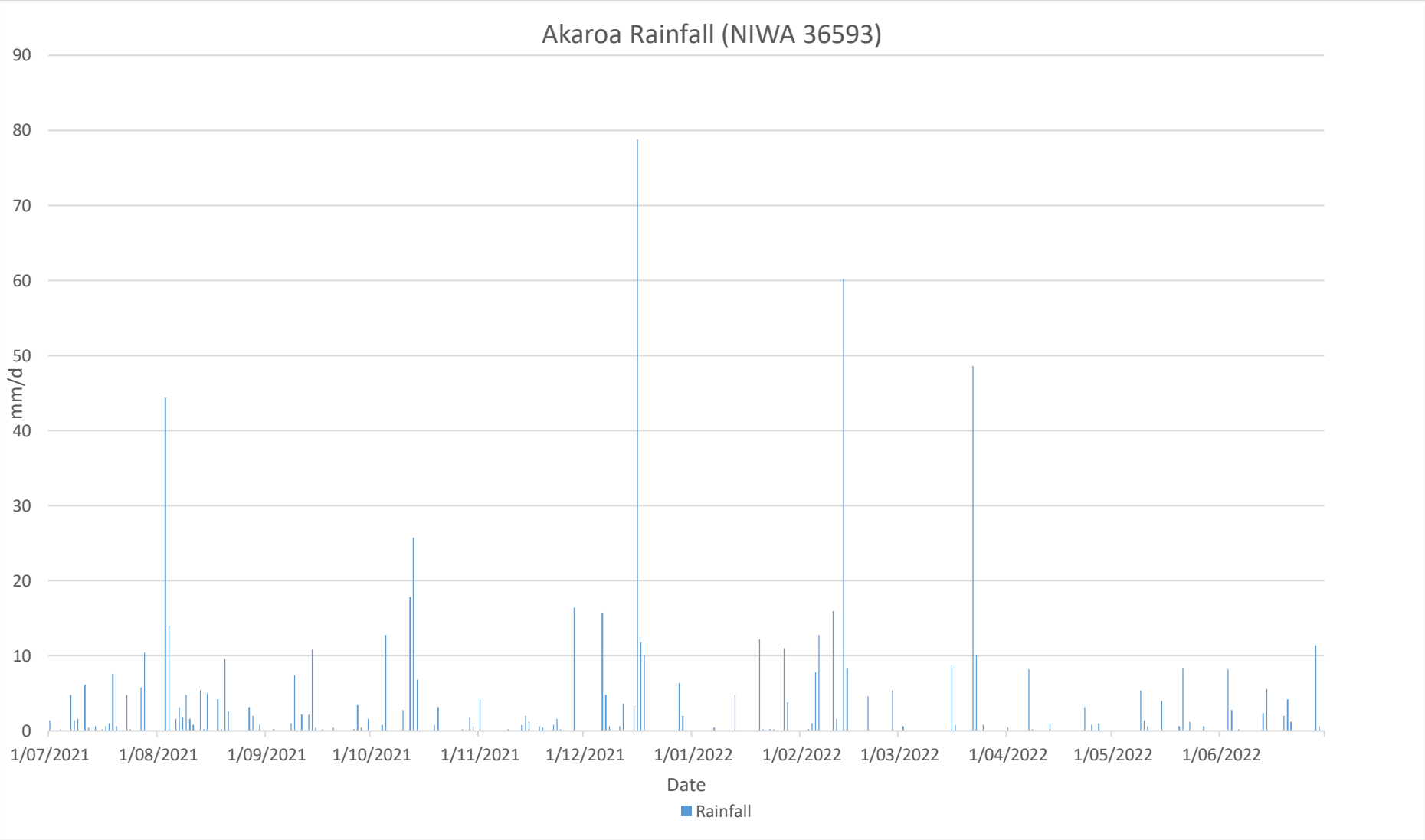
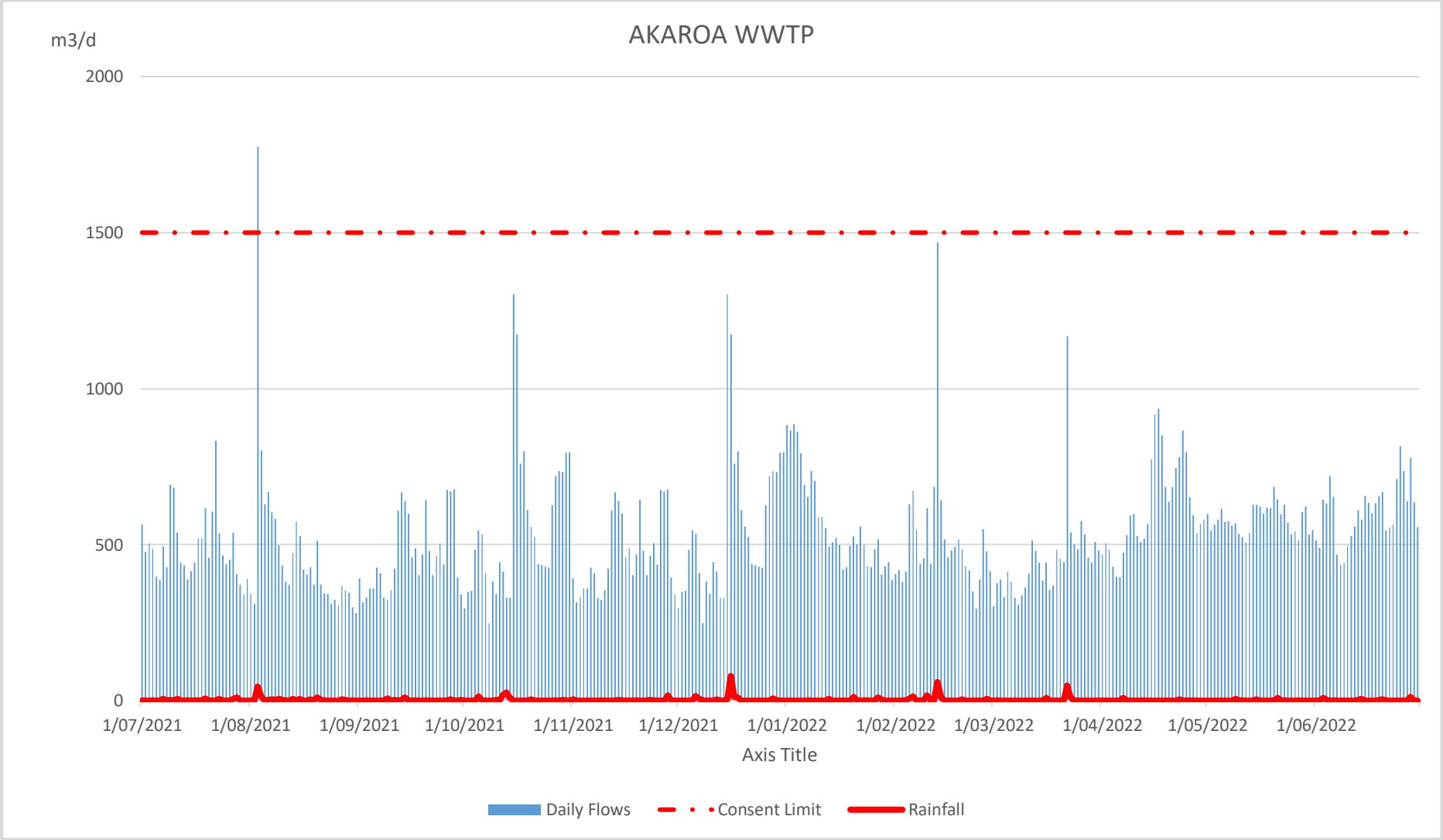


Figure 1Attachment 1.2 Consent Limit



Attachment 1.3 Rainfall NIWA 36593.



Attachment 1.3 Flow and Rain Akaroa WWTP 2021 -2022.

Treated Wastewater Quality

6. 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. **Complies (Attachment 1.5)**

Table 1 - Sample Collection Frequencies

Three times per week from 1 Dec to 28 Feb – on non-consecutive days	Weekly (From 1 Dec to end of Feb)	Monthly (from 1 Mar to 30 Nov)	Annually (duringjan sampling event)
Faecal coliforms		Faecal coliforms	
Enterococci		Enterococci	
	Total suspended solids (TSS)	Total suspended solids (TSS)	
	Total five-day biochemical oxygen demand (TBOD5)	Total five-day biochemical oxygen demand (TBOD5)	
	Dissolved reactive phosphorus (DRP)	Dissolved reactive phosphorus (DRP)	
	Ammonia	Ammonia	
	Nitrogen oxides (NOx)	Nitrogen oxides (NOx)	
	Total phosphorus (TP)	Total phosphorus (TP)	
	Total nitrogen (TN)	Total nitrogen (TN)	
	Temperature	Temperature	
			Lead
			Copper
			Chromium
			Cadium
			Zinc

7. Sampling must be undertaken in accordance with the sampling schedule in Conditions (7) and (12). The sampling schedule shall seek to incorporate sampling during times with variable environmental parameters. This sampling schedule is to be agreed with the Canterbury Regional Council, Regional Leader – Compliance Monitoring within one month of the commencement of this resource consent. **Complies**
8. The median concentration of faecal coliforms in the treated wastewater as calculated from the results of any five consecutive treated wastewater samples shall not exceed 1,000 colony-forming units per 100 millilitres. The median shall be calculated from the results of any five consecutive treated wastewater samples analysed. **Complies (Attachment 1.5)**
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. **Complies (Attachment 1.5)**
10. The median concentration of Total Suspended Solids (TSS) in the treated wastewater do not exceed 30 grams per cubic metre. The median shall be calculated from the results of any five consecutive treated wastewater samples analysed. **Non-Compliance (Attachment 1.5)**

In annex 1.5 Laboratory results, we can see that the consent limits for SST exceeded four times the limit of 30 mg/l, with 38 mg/l being the maximum number; the analysis table is listed below.

Parameter	Description	Root Cause	Countermeasure	Preventive measures	Responsible	Date
TSS	Increased loading to WWTP (Summer)	Population increase during summer holidays	Follow up the behaviour of this parameter to identify times and operation conditions	Establish a plan before summer holidays to control the overloads	CCC, Process Eng.	Asap

Annually in Jan - Condition 6 (Metals)					
Date	**Lead (mg/L)**	**Copper (mg/L)**	**Chromium (mg/L)**	**Cadmium (mg/L)**	**Zinc (mg/L)**
6/01/2021	<0.001	0.0078	<0.001	<0.001	0.057
12/01/2022	<0.001	0.0038	<0.001	<0.001	0.028

Attachment 1.6 Heavy Metals

			Condition 6 - 9 (Samples taken 1 Mar - 30 Nov: Monthly, 1 Dec - end-Feb: Weekly)																
Sample date	Sample time	Sample No.	BOD5 (g/m3) cond. 6	Median* BOD5 (g/m3) cond. 8 & 9	OK? <30g/m3	Suspended solids (g/m3) cond. 6	Median* suspended solids (g/m3) cond. 8 & 9	OK? <30g/m3	Faecal coliforms (CFU/100mL) cond. 6		Median Faecal coliforms (CFU/100mL) cond. 7 & 9	OK? <1000CFU/100m	Enterococci (MPN/100ml)	Dissolved reactive phosphorus (g/m3)	Ammonia (g/m3)	Total nitrogen (g/m3)	Oxides of nitrogen (NOx)	Total Kjeldahl Phosphorus (TKP) (g/m3)	Temp. (°C)
24-Jun-21	8:40	2109266	7.3			18			<10	10		YES	31	0.78	1.2	15.6	13	0.98	11.7
14-Jul-21	9:20	2112156	11			24			<10	10		YES	20	2.3	4.4	22.9	17	2.3	10.1
26-Aug-21	9:30	2113295										YES							
15-Sep-21	9:45	2116763	27			38			130e	130		YES	63	2.3	8.9	21.3	9.3	3	10.2
13-Oct-21	9:00	2118437	17			40			1200e	1200		YES	280	1	8.9	16	5	1.6	12.6
26-Nov-21	13:30	2121376	9.4	11	YES	54	38	NO	80e	80	80	YES	52	1.5	5.8	27.6	21	2.3	
3-Dec-21	8:35	2122616	11	11	YES	24	38	NO	590	590	130	YES	52	1.9	4.1	24.9	19	2.5	17.5
8-Dec-21	17:20	2122639	5.4	11	YES	7	38	NO	<10	10	130	YES	<10	1.7	4.3	21	17	1.8	
15-Dec-21	7:50	2122656	6.2	10.2	YES	14	31	NO	<10	10	105	YES	<10	2.2	3.5	22.7	18	2.2	14
22-Dec-21	11:35	2122667	10	9.7	YES	4.9	19	YES	<10	10	45	YES	20	0.81	2.2	18.6	15	0.99	23
30-Dec-21	15:40	2125251	>26	9.4	YES	40	19	YES	410	410	45	YES	150	2.7	29	36.7	6.7	3.7	
5-Jan-22	14:00	2123936	13	10	YES	14	14	YES	<10	10	10	YES	<10	2.8	17	29.4	5.4	3.4	20.9
12-Jan-22	16:17	2123916	9.9	9.9	YES	20	14	YES	<10	10	10	YES	190	2.9	12	27	13	4	25.6
19-Jan-22	8:24	2123950	11	10	YES	27	17	YES	20e	20	10	YES	20	3	9.1	35	24	4.1	14
26-Jan-22	12:35	2123959	8	10	YES	17	18.5	YES	<10	10	10	YES	<10	1.8	5.3	27.9	21	3	18
1-Feb-22	9:44	2201287	6.7	9.9	YES	14	18.5	YES	400	400	15	YES	160	2.3	5.6	29.9	22	2.8	17
9-Feb-22	9:55	2201298	6.5	8.95	YES	13	15.5	YES	<10	10	10	YES	<10	1.6	5.5	24.7	19	2	
16-Feb-22	9:45	2201303	3.7	7.35	YES	13	15.5	YES	<10	10	10	YES	<10	1.4	1.7	20.1	18	1.6	19
24-Feb-22	15:00	2201308	5.2	6.6	YES	100	15.5	YES	<10	10	10	YES	<10	0.27	2.2	25.3	22	0.84	15
3-Mar-22	10:45	2202015	9.5	6.6	YES	13	13.5	YES	<10	10	10	YES	41	2.1	3.8	27.9	24	2.2	16.4
28-Apr-22	7:35	2202936	8	6.6	YES	15	13.5	YES	<10	10	10	YES	<10	1.4	2.8	19	14	2.2	16
24-May-22	8:45	2204386	9.3	7.25	YES	15	14	YES	<10	10	10	YES	<10	1.1	2.4	15.8	13	1.3	13
9-Jun-22	9:05	2208423	11	8.65	YES	18	15	YES	10e	10	10	YES	10	1.5	3.9	20	15	1.9	13

Attachment 1.5 Lab Results

Receiving Environment Water Quality Sampling for Shellfish Gathering

11. The receiving water shall be sampled and analysed for faecal coliforms and enterococci at the following locations, as shown on the attached Plan CRC204086, which forms part of this resource consent:
    At the point on the shoreline nearest the outfall (edge of the 100 m mixing zone); At the shoreline 400 m south of point (a); and At the shoreline 400 m north of point (a). **Complies (Attachment 1.7).**
12. Receiving water sampling and analysis for faecal coliforms and enterococci concentrations at the locations described in Condition (12) shall occur at least weekly between 1 December and 28 February each year and monthly between 1 March and 30 November each year. **Complies (Attachment 1.7).**
13. In the event that the analysis of receiving water quality samples collected at any site in accordance with Condition (12) and analysed in accordance with Condition (13) indicates 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 must notify the Canterbury Regional Council, Attention: Regional Leader – Compliance Monitoring, within one month of detecting the exceedance.
    Complies (Attachment 1.7)
    Advice Note: *For the purpose of this condition, "at any site" means that the assessment against the tr igger value shall be on an individual site basis.*
14. The notification required under Condition (14) 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.
    Complies (Attachment 1.7)

Receiving environment sampling results

The table below provides results of sampling in the area receiving the discharge from the Akaroa wastewater treatment plant. Surface water samples are taken from three sites: 400m north, 400m south of the outfall and at the shoreline nearest the outfall. These samples are then analysed for the faecal coliforms and enterococci.

Conditions 10-13					Dec-Feb: Weekly	Dec-Feb: Weekly, Mar-Nov: Monthly				
Sample date	Site	Sample time	Time between WW and rec. env. sample	Lab sample no.	Enterococci (MPN/100ml)	Faecal coliforms (CFU/100ml)	Median	< 14/100ml?	% > 43 CFU/100ml of total samples	< 10%?
9/04/2021	Shoreline nearest outfall	10:20	0:15	2105162	NR	1				
	400m S on Shoreline	10:25	0:05	2105161	NR	1	1	YES		
	400m N on shoreline	10:15	0:20	2105160	NR	1	1	YES		
6/05/2021	Shoreline nearest outfall	9:25	0:15	2107254	NR	1				
	400m S on Shoreline	9:30	0:20	2107253	NR	2	1	YES		
	400m N on shoreline	9:20	0:10	2107252	NR	1	1	YES		
24/06/2021	Shoreline nearest outfall	8:30	0:15	2109269	NR	10				
	400m S on Shoreline	8:35	0:20	2109268	NR	10	1	YES		
	400m N on shoreline	8:25	0:10	2109267	NR	10	1	YES		
14/07/2021	Shoreline nearest outfall	9:05	0:15	2112159	NR	1				
	400m S on Shoreline	9:10	0:10	2112158	NR	1	1	YES		
	400m N on shoreline	9:00	0:20	2112157	NR	1	1	YES		
26/08/2021	Shoreline nearest outfall	9:35	0:20	2113298	NR	1				
	400m S on Shoreline	9:30	0:15	2113297	NR	1	1	YES		
	400m N on shoreline	9:25	0:10	2113296	NR	1	1	YES		
15/09/2021	Shoreline nearest outfall	9:35	0:10	2116764	NR	1				
	400m S on Shoreline	9:40	0:05	2116762	NR	1	1	YES		
	400m N on shoreline	9:30	0:15	2116761	NR	1	1	YES		
13/10/2021	Shoreline nearest outfall	9:35	0:10	2118440	NR	*20*				
	400m S on Shoreline	9:40	0:05	2118439	NR	*8*	1	YES		
	400m N on shoreline	9:30	0:15	2118438	NR	400	1	YES		
26/11/2021	Shoreline nearest outfall	13:15	0:15	2121379	NR	1				
	400m S on Shoreline	13:20	0:20	2121378	NR	1	1	YES		
	400m N on shoreline	13:10	0:10	2121377	NR	1	1	YES		
3/12/2021	Shoreline nearest outfall	8:30	0:10	2122619	75	1				
	400m S on Shoreline	8:35	0:05	2122618	10	7	1	YES		
	400m N on shoreline	8:40	0:15	2122617	10	1	1	YES		
8/12/2021	Shoreline nearest outfall	17:28	0:15	2122642	10	4				
	400m S on Shoreline	17:35	0:20	2122641	10	1	1	YES		
	400m N on shoreline	17:30	0:10	2122640	10	1	1	YES		
15/12/2021	Shoreline nearest outfall	7:56	0:15	2122642	10	4				
	400m S on Shoreline	8:08	0:20	2122641	10	1	1	YES		
	400m N on shoreline	8:14	0:10	2122640	10	1	1	YES		
22/12/2021	Shoreline nearest outfall	11:42	0:07	2122670	10	2				
	400m S on Shoreline	11:37	0:02	2122669	10	1	1	YES		
	400m N on shoreline	11:49	0:14	2122668	10	2	1	YES		
30/12/2021	Shoreline nearest outfall	15:36	0:04	2125254	63	122				
	400m S on Shoreline	15:38	0:02	2125253	10	2	1	YES		
	400m N on shoreline	15:02	0:38	2125252	10	6	1	YES		
5/01/2022	Shoreline nearest outfall	13:25	0:35	2123939	10	1				
	400m S on Shoreline	13:30	0:30	2123938	10	1	1	YES		
	400m N on shoreline	13:20	0:40	2123937	10	1	1	YES		
12/01/2022	Shoreline nearest outfall	16:12	0:05	2123919	690	6				
	400m S on Shoreline	16:10	0:07	2123918	280	10	1	YES		
	400m N on shoreline	16:00	0:17	2123917	10	10	2	YES		
19/01/2022	Shoreline nearest outfall									
	400m S on Shoreline	8:14	0:10	2123952	10	1	1	YES		
	400m N on shoreline	8:35	0:31	2123951	120	11	6	YES		
26/01/2022	Shoreline nearest outfall	12:40	0:05	2123962	10	4				
	400m S on Shoreline	12:45	0:10	2123961	10	1	1	YES		
	400m N on shoreline	12:55	0:20	2123960	10	1	6	YES		
1/02/2022	Shoreline nearest outfall	9:47	0:05	2201290	10	9				
	400m S on Shoreline	9:53	0:10	2201289	10	3	1	YES		
	400m N on shoreline	10:00	0:20	2201288	10	1	1	YES		
9/02/2022	Shoreline nearest outfall	10:00	0:05	2201301	10	1				
	400m S on Shoreline	10:10	0:10	2201300	10	1	1	YES		
	400m N on shoreline	10:15	0:20	2201299	10	1	1	YES		
16/02/2022	Shoreline nearest outfall	10:00	0:05	2201301	10	1				
	400m S on Shoreline	10:10	0:10	2201300	10	1	1	YES		
	400m N on shoreline	10:25	0:20	2201299	10	19	1	YES		
24/02/2022	Shoreline nearest outfall	15:10	0:05	2201301	10	1				
	400m S on Shoreline	15:15	0:10	2201300	10	1	1	YES	0%	YES
	400m N on shoreline	15:20	0:20	2201299	10	1	1	YES	0%	YES
3/03/2022	Shoreline nearest outfall	10:20	0:25	2202018	NR	2				
	400m S on Shoreline	10:30	0:15	2202017	NR	1	1	YES		
	400m N on shoreline	10:15	0:30	2202016	NR	1	1	YES		
28/04/2022	Shoreline nearest outfall	7:20	0:15	2202939	NR	1				
	400m S on Shoreline	7:15	0:10	2202938	NR	1	1	YES		
	400m N on shoreline	7:10	0:05	2202937	NR	2	1	YES		
24/05/2022	Shoreline nearest outfall	8:20	0:00	2204387	NR	1				
	400m S on Shoreline	8:25	0:05	2204389	NR	1		YES		
	400m N on shoreline	8:30	0:10	2204388	NR	2		YES		

Attachment 1.7: Receiving environment Sampling Results.

Inflow and Infiltration (I&I)

CCC have been undertaking network renewals and repairs to reduce unwanted inflows and infiltration (I&I) entering the Akaroa wastewater network. This work was carried out in 2019 and further works in 2021 – 2022. These repair plans were identified from a combination of network restriction models, camera inspections and wastewater temperature surveys.

This work addresses several issues:

- Reduced flows to the treatment plant may improve treatment quality and result in:
    - Lower mass flows of carbonaceous nutrients in treated wastewater discharged to Akaroa Harbour.
    - Lower turbidity in treated wastewater in treated wastewater discharged to Akaroa Harbour.

- Reduced I&I will permit the future treated water irrigation scheme to reduce the storage volumes that will be constructed as part of the scheme. Although the scheme is able to accommodate 20,000m³ of storage a reduction on this figure to 12,000m³ or 16,000m³ would be advantageous.

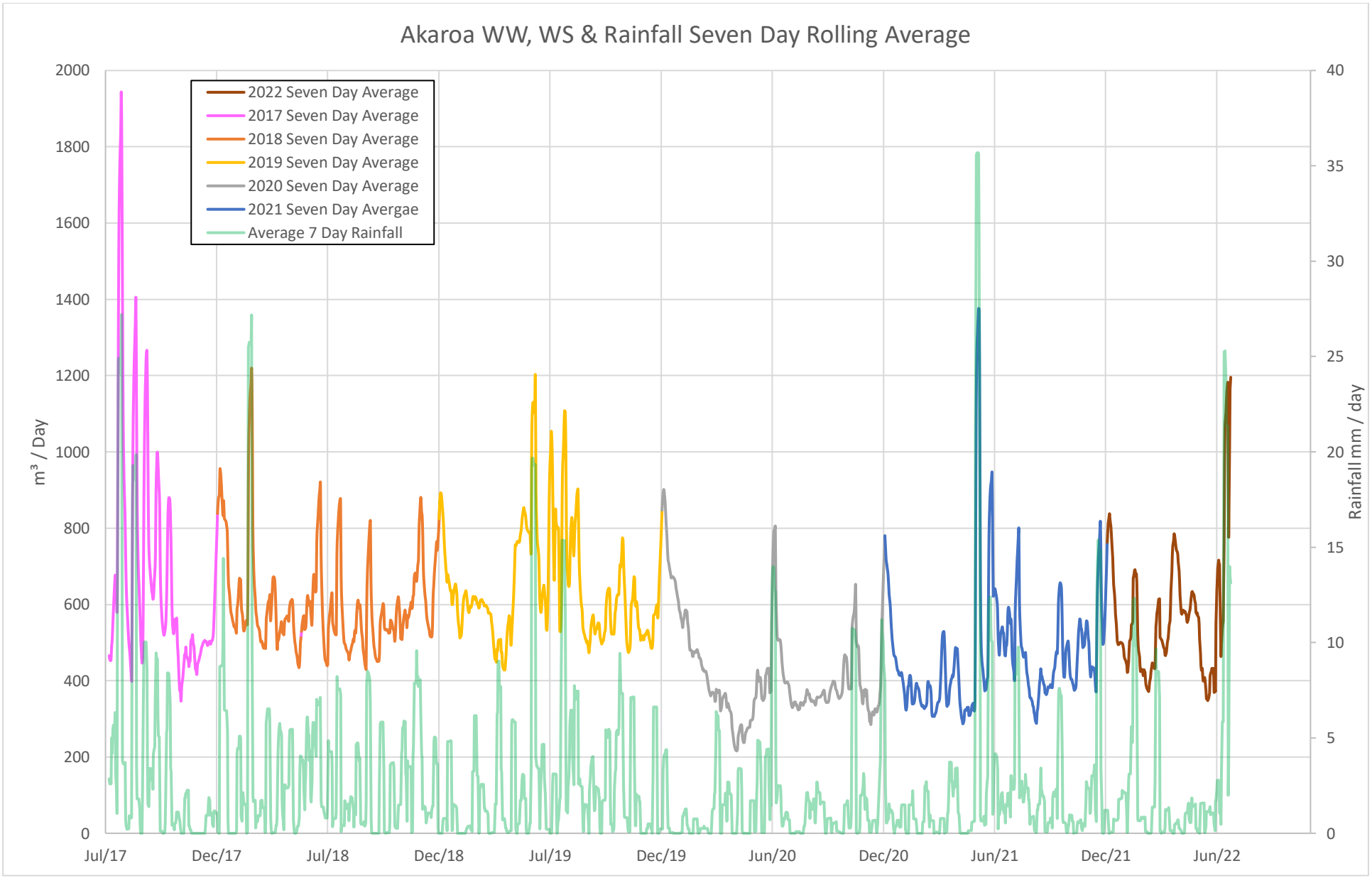
The total value of these works will be approximately $3.9M. The majority of these are complete with the remainder (approximately 20% of the contract value) expected to finish in the 2022 calendar year. Key areas of work are as follows:

Armstrong Crescent	Completed
Aubery Street	Completed
Clare Lane Akaroa	Completed
Rue Grehan	Completed
Hempleman Drive	Completed
Newton Place	Completion by end of 2022
Percy Street	Completion by end of 2022
Noyer / Walnut Place	Completed
Rue Jollie	Completion by end of 2022
Settlers Hill	Completed
Watson Street	Completed
Woodills Road	Completed
Beach Road (Glen Bay)	Completed
Akaroa Northern Flats	Completed
Rue Lavaud	Completed
Miscellaneous Manhole Repairs	Completed

Outcomes:

Early indications are that wet weather wastewater flows have reduced as a result of these works as can be seen in 2021 and 2022.

Dry weather groundwater inflows are more difficult to predict and will require long term monitoring (beyond 12 months) to determine the extent of improvement. The 2020 - 2021 data makes this particularly difficult as the drought of that year and Covid impacts on Akaroa visitor numbers made it an exceptionally low year for treatment plant flows.



Akaroa Consent Monitoring Report CRC204086 – 2021-2022.

Table 1 – Annual Flows and Rainfall

Period	WW Outfall Flowmeter (m^3)	Rainfall (mm)
July 2017 – June 2018	236,697	1366
July 2018 – June 2019	219,911	1034
July 2019 – June 2020	195,541	894
July 2020 – June 2021	156,859	801
July 2021– June 2022	186,779	915