Akaroa

Wastewater Treatment Plant

Annual Monitoring Report

07/2013 – 06/2014

Prepared by: City Care Ltd
Hugh Blake-Manson

On behalf of:

Christchurch City Council, City Water & Waste Unit

31 August 2014

Christchurch City Council

city care

Resource Consent Number: CRC133179 (replaces CRC071865.1)
File Number: CO6C/01282
Client Name: Christchurch City Council (City Solutions)
To: To discharge contaminants into the Coastal Waters.
Consent Location: Red House Bay, Beach Road, AKAROA HARBOUR
State: Current

Events:

8/09/2013 Commencement Date
8/09/2020 Consent Expires
8/09/2020 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.
	Partial compliance; partially treated wastewater was discharged in March 2014.
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 750 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).
	Partial compliance (Attachments 1.1 and 2.1, 2.2); Rainfall > 50mm (3 days) in October 2013, four times in March 2014
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: 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 phorphorous (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)
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 (Attachment 3.1); maximum medians were 6.9 mg/L BOD_5 and 17 mg/L TSS
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 exceedence; 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.
	Compliance; ECAN was notified of seven exceedances of the trigger levels. 10.8% of all summer samples > 43 cfu/100ml
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.
	Compliance - ECAN was notified
15	Grab samples of the receiving water shall be collected and analysed for temperature, Total Nitrogen (TN), Dissolved Inorganic Nitrogen (DIN, calculated as NOx + 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 the analysis of receiving water samples collected in accordance with Conditions (15) (a) to (c) indicates trigger values of: a. Dissolved inorganic nitrogen (DIN) (combined total of NOx and ammonia) that exceeds a median of 0.062 milligrams per litre (mg/L); b. Dissolved reactive phosphorus (DRP) that exceeds a median of 0.018 mg/L; and c. Ammonia that exceeds a maximum of 0.910 mg/L: 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.
	Partial compliance (Attachment 3.3) DIN and DRP exceed twice. Plant operation reviewed, no abnormal operation occurring
18	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. 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.
	See comments below
19	All wastewater and receiving environment samples shall: a. Be collected by a suitably qualified or experienced person; and 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.
	Compliance; details of all sample methods and dates/times provided to ECAN monthly; non-accredited TN results for receiving environment samples accepted by ECAN (according to 09/07/2012 email) while CCC lab pursues validation.
20	At the time the wastewater and receiving environment samples are collected, the following parameters shall be recorded; a. time and date of sampling and time delay between wastewater and receiving environment samples collection; b. the precipitation over the three consecutive days prior to sampling; c. the tidal state in the receiving environment at the time of sampling in the receiving environment; and d. wind direction and strength.
	Compliance (Attachment 3.3)
21	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.
	Compliance via this report
22	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: a. Results of the monitoring undertaken in the previous year from 1 July to 30 June; b. An analysis of monitoring results against limits and trigger values specified in Conditions (8), (9), (13) and (17) of this consent; 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). 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; e. Comparison of monitoring results as required in Conditions (6), (11), (12), (15) and (16) with historical data; 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 g. An interpretation of the results in relation to the effects of the discharge on the environment; h. Identification of any measures taken to remedy any exceedences; i. Details of all changes or upgrades to the treatment plant that may affect the quality or volume of treated wastewater discharged; and j. Summary of any inflow and/or infiltration investigations or works undertaken in the reporting period.
	See below
23	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.
	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.
	Compliance
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).
	Compliance
28	The Canterbury Regional Council may, on any of the last five working days of May or November each year, serve notice Consent detail 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

Flows into the Akaroa Wastewater Treatment Plant (WWTP) were heavily impacted by heavy rain and stormwater during this reporting period causing discharge in excess of the 750-m^3/d dry weather maximum seven times. For these events, more than 50 mm of rainfall was received over three consecutive days (Attachment 2.1), No exceedance of the 3,000-m^3/d wet weather maximum applied and flows were compliant. An extreme event of 209.2, 240.6 and 228.8 mm of rainfall in three days also caused the wet weather maximum to be exceeded from 18-20/04/2014. These weather events resulted in approximately the same flow through the WWTP compared to the previous reporting period (i.e., 105,327 m^3 in 2012-2013 vs. 103,064 m^3 in 2013-2014) the 95th percentile for flow recorded at 470 m^3/d (down from to 570m^3/d in 2012/2014) (Attachment 1).

Plant performance relating to organic parameters BOD_5, TSS, was very good with no exceedances above the 30-mg/L median limits for effluent quality (Table 1). Similarly Faecal coliforms (FC) compliance was excellent.

The consent was amended 8/09/2014 with a number of new conditions.

Receiving Environment Monitoring

Some trigger limits were exceeded for human-health related parameters (Attachment 3.2). An average of 10.8% of FC samples were >43 CFU/100mL. All location medians were <14 CFU/100mL FC.

Nutrient data gathered from the receiving environment did not exceeded trigger values at all locations for NOx (Attachment 3.3). This represents an improvement compared to last year when 3 medians were exceeded.

DIN and DRP exceeded trigger values twice each at the same sample date/time. These levels do not appear related to the treatment process. Exceedances and transgressions relating to the receiving environment should not be linked to the WWTP discharge as discussed in Akaroa WWTP's 1) annual monitoring reports for 2012-2013 and 2) summer sampling results for receiving water faecal coliforms. A direct causative relationship cannot be determined from the data likely due to the impact from other sources (e.g., runoff, tourist ships, etc.).

Table 1. Summary of Monitoring Non-Compliances from July 2013-June 2014.

Treatment Plant Effluent			
Parameter	**Single Samples Exceeding Limit**	**Median Limit Exceedances**	**Condition Non-Compliances**
Dry Weather Flow < 750 m3/d	7	-	7
Wet Weather Flow < 3,000 m3/d	0	-	
BOD_5 < 30 mg/L	0	0	0
TSS < 30 mg/L	0	0	
FC < 1,000 CFU/100 mL	0	0	0
Receiving Environment			

Parameter	Single Samples Exceeding Limit	Median Limit or % Exceedances	Condition Non-Compliances
Summer FC < 14 CFU/100 mL	7	0	7
<10% Summer FC > 43 CFU/100 mL	7	3	
DIN < 0.062 mg/L	2	0	2
DRP median < 0.018 mg/L	2	0	
NH3 median < 0.910 mg/L	2	0	

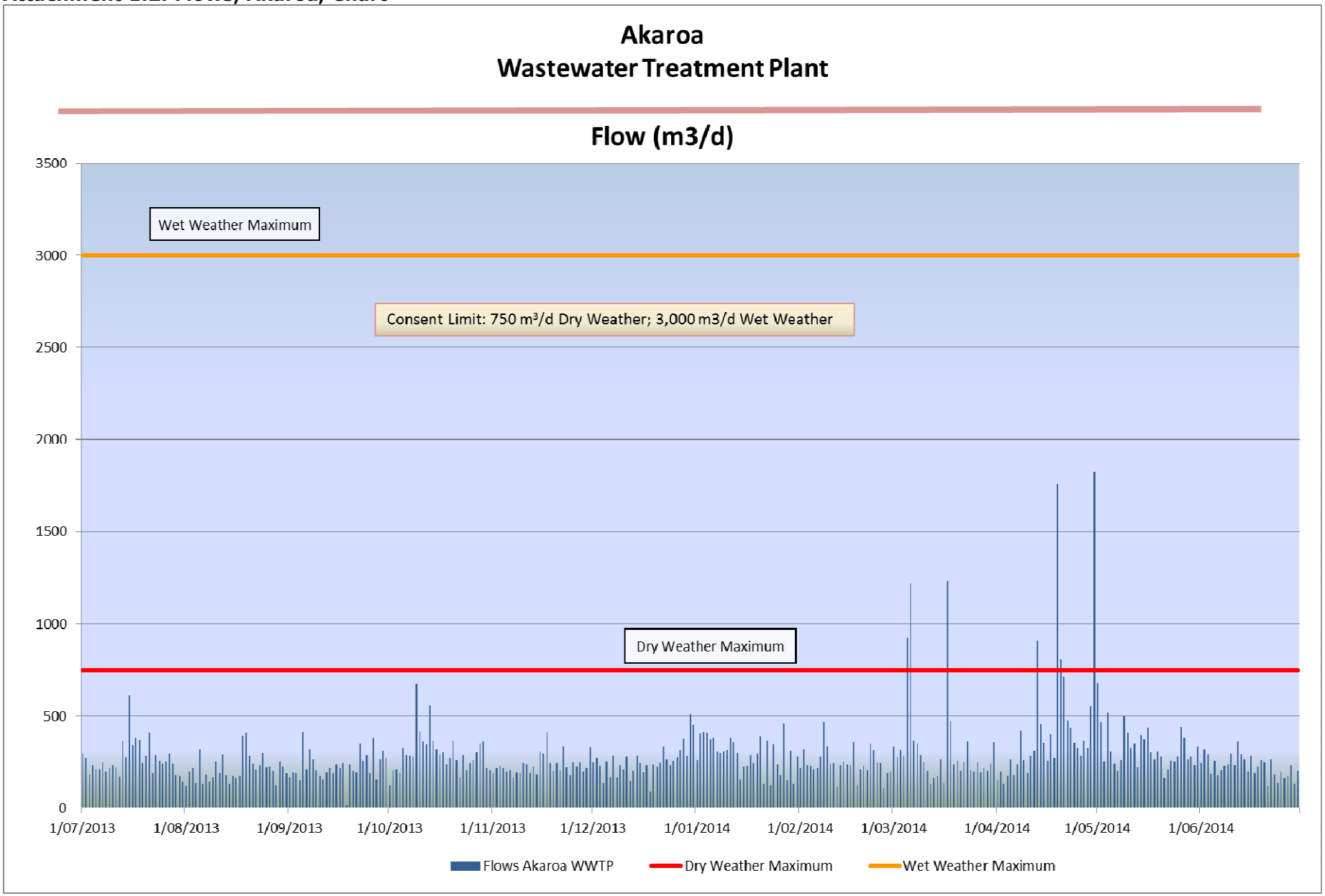
Attachment 1.1: Flows, Akaroa, Data

Asset Owner:	Christchurch City Council
Laboratory	Christchurch City Council Laboratory, City Water & Waste Unit

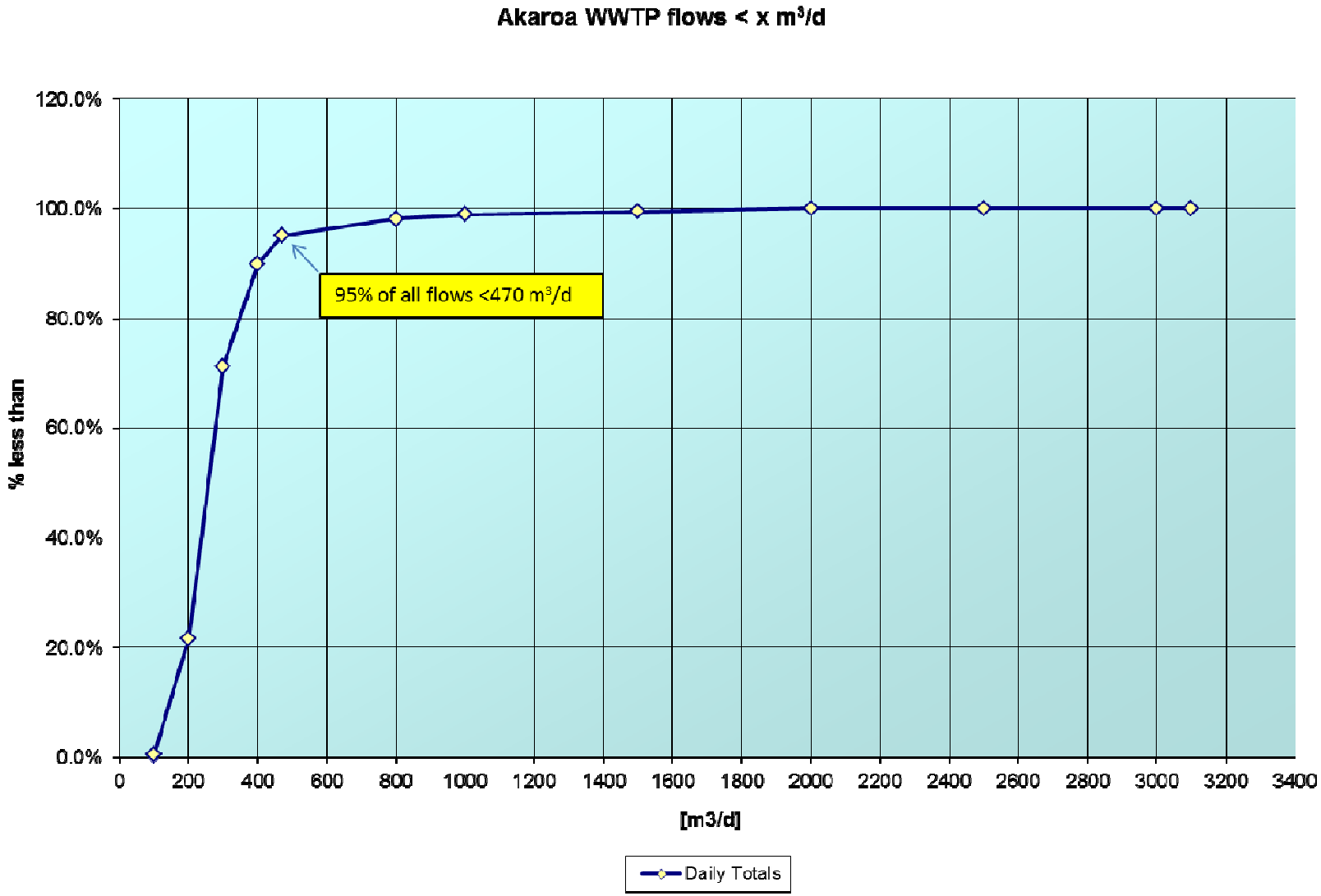
Max:	750	m^3/d	Dry weather	Max:	3000	m^3/d	Wet weather

Date	Flow [m^3/d]	Date	Flow [m^3/d]	Date	Flow [m^3/d]	Date	Flow [m^3/d]
1/07/2013	299	1/10/2013	124	1/01/2014	260	1/04/2014	154
2/07/2013	268	2/10/2013	208	2/01/2014	407	2/04/2014	202
3/07/2013	180	3/10/2013	213	3/01/2014	412	3/04/2014	131
4/07/2013	231	4/10/2013	191	4/01/2014	409	4/04/2014	171
5/07/2013	213	5/10/2013	326	5/01/2014	373	5/04/2014	266
6/07/2013	213	6/10/2013	291	6/01/2014	383	6/04/2014	177
7/07/2013	248	7/10/2013	282	7/01/2014	308	7/04/2014	235
8/07/2013	202	8/10/2013	276	8/01/2014	300	8/04/2014	422
9/07/2013	215	9/10/2013	675	9/01/2014	309	9/04/2014	260
10/07/2013	231	10/10/2013	419	10/01/2014	316	10/04/2014	192
11/07/2013	221	11/10/2013	360	11/01/2014	381	11/04/2014	284
12/07/2013	167	12/10/2013	345	12/01/2014	356	12/04/2014	312
13/07/2013	366	13/10/2013	555	13/01/2014	302	13/04/2014	909
14/07/2013	272	14/10/2013	365	14/01/2014	156	14/04/2014	456
15/07/2013	613	15/10/2013	321	15/01/2014	223	15/04/2014	353
16/07/2013	342	16/10/2013	294	16/01/2014	227	16/04/2014	257
17/07/2013	380	17/10/2013	305	17/01/2014	288	17/04/2014	402
18/07/2013	368	18/10/2013	235	18/01/2014	245	18/04/2014	269
19/07/2013	246	19/10/2013	268	19/01/2014	298	19/04/2014	1759
20/07/2013	282	20/10/2013	367	20/01/2014	390	20/04/2014	810
21/07/2013	411	21/10/2013	261	21/01/2014	133	21/04/2014	713
22/07/2013	194	22/10/2013	163	22/01/2014	367	22/04/2014	480
23/07/2013	288	23/10/2013	289	23/01/2014	123	23/04/2014	432
24/07/2013	256	24/10/2013	209	24/01/2014	347	24/04/2014	353
25/07/2013	239	25/10/2013	243	25/01/2014	236	25/04/2014	327
26/07/2013	254	26/10/2013	259	26/01/2014	175	26/04/2014	283
27/07/2013	296	27/10/2013	305	27/01/2014	458	27/04/2014	364
28/07/2013	240	28/10/2013	349	28/01/2014	151	28/04/2014	326
29/07/2013	178	29/10/2013	361	29/01/2014	313	29/04/2014	551
30/07/2013	172	30/10/2013	218	30/01/2014	133	30/04/2014	1828
31/07/2013	145	31/10/2013	207	31/01/2014	278	1/05/2014	678
1/08/2013	122	1/11/2013	188	1/02/2014	217	2/05/2014	467
2/08/2013	199	2/11/2013	217	2/02/2014	321	3/05/2014	254
3/08/2013	218	3/11/2013	227	3/02/2014	233	4/05/2014	520
4/08/2013	135	4/11/2013	218	4/02/2014	230	5/05/2014	308
5/08/2013	320	5/11/2013	201	5/02/2014	211	6/05/2014	239
6/08/2013	131	6/11/2013	207	6/02/2014	216	7/05/2014	205
7/08/2013	182	7/11/2013	163	7/02/2014	277	8/05/2014	259
8/08/2013	146	8/11/2013	196	8/02/2014	467	9/05/2014	498
9/08/2013	165	9/11/2013	190	9/02/2014	332	10/05/2014	410
10/08/2013	254	10/11/2013	246	10/02/2014	239	11/05/2014	327
11/08/2013	191	11/11/2013	235	11/02/2014	246	12/05/2014	351
12/08/2013	295	12/11/2013	190	12/02/2014	117	13/05/2014	221
13/08/2013	176	13/11/2013	226	13/02/2014	233	14/05/2014	396
14/08/2013	132	14/11/2013	179	14/02/2014	252	15/05/2014	372
15/08/2013	171	15/11/2013	311	15/02/2014	235	16/05/2014	432
16/08/2013	161	16/11/2013	297	16/02/2014	233	17/05/2014	304

Attachment 1.2: Flows, Akaroa, Chart



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



Attachment 2.1: Rainfall data, Akaroa

Station information:

Name	Agent Number	Networ	Latitude (dec.deg)	Longitu	Height (r	Posn_Pr	Observing Authority
Akaroa Ev	36593	H32895	-43.809	173	45	G	Niwa

Note: Position precision types are: "W" = based on whole minutes, "T" = estimated to tenth minute,
G = derived from gridref , "E" = error cases derived from gridref,
H = based on GPS readings (NZGD49), "D" = by definition i.e. grid points.

Rain: Daily

Station	Date(NZST)	Time (NZST)	Amount (mm)	3 day total (mm)	SofG	Deficit (mm)	Runoff (mm)	Period (Hrs)	Freq	Comment
36593	20131007	800	0		-	42.4	0	24	D	
36593	20131008	800	3		-	42.8	0	24	D	
36593	20131009	800	52.2	55.2	-	0	6	24	D	>50mm/3d
36593	20131010	800	0.8	56	-	2.6	0	24	D	>50mm/3d
36593	20131011	800	0	53	-	6.1	0	24	D	>50mm/3d
36593	20131012	800	14.8	15.6	-	0	5.3	24	D	
36593	20140303	800	11.6		-	93.6	0	24	D	
36593	20140304	800	11.6		-	84	0	24	D	
36593	20140305	800	119.2	142.4	-	0	33	24	D	>50mm/3d
36593	20140306	800	20.2	151	-	0	17.6	24	D	>50mm/3d
36593	20140307	800	0	139.4	-	2.6	0	24	D	>50mm/3d
36593	20140308	800	0	20.2	-	5.1	0	24	D	
36593	20140315	800	0		-	23	0	24	D	
36593	20140316	800	43.2		-	0	17.7	24	D	
36593	20140317	800	37.6	80.8	-	0	35	24	D	>50mm/3d
36593	20140318	800	0.6	81.4	-	2	0	24	D	>50mm/3d
36593	20140319	800	0	38.2	-	4.5	0	24	D	
36593	20140416	900	0.2		-	3.5	0	24	D	
36593	20140417	900	11.8		-	0	7.1	24	D	
36593	20140418	900	197.2	209.2	-	0	196	24	D	>50mm/3d
36593	20140419	900	31.6	240.6	-	0	30.4	24	D	>50mm/3d
36593	20140420	900	0	228.8	-	1.2	0	24	D	>50mm/3d
36593	20140421	900	0	31.6	-	2.5	0	24	D	
36593	20140428	900	0		-	8.9	0	24	D	
36593	20140429	900	46.2		-	0	36.1	24	D	
36593	20140430	900	28.2	74.4	-	0	27	24	D	>50mm/3d
36593	20140501	900	0.2	74.6	-	1	0	24	D	>50mm/3d
36593	20140502	900	0	28.4	-	1.9	0	24	D	

Attachment 2.2: Closing of Rainfall Station 36593, Akaroa

Station Details for Agent: 36593

Check Data Availability | Sensor and Site History

Parameter	Indicator
Agent Number	36593
Network Number	H32895
Name	Akaroa Ews
Lat (dec deg, S of equator is neg)	-43.80938
Longitude (dec deg, E of Greenwich is pos e.g. NZ)	172.96574
Position Precision	G
Note: Position precision types are: *"W" = based on whole minutes, "T" = estimated to tenth minute,* *"G" = derived from gridref, "E" = error cases derived from gridref,* *"H" = based on GPS readings (NZGD49), "D" = by definition i.e. grid points.*	
Height above MSL in metres	45m
Grid Reference (NZ Metric Map Series)	N36073109
Start Date	12-Nov-2008
End Date	-
Closed Indicator (Closed = 1)	0
Stty Station Type	C: Clitel
Synoptic Number (World Met. Organisation Number)	-
WRA No	328905
Observing Authority	Niwa

Current Indicators

Note: the following indicators show the current status for open stations.
Closed stations may show no recorded parameters.

Parameter	Indicator	Parameter	Indicator
Rain	X	Evaporation	-
Surface Wind Dirn	X	Surface Wind Speed	X
Max Gust Dirn	-	Max Gust Speed	-
Solar Radiation	-	Sunshine Hours	-
10cm Earth Temp	X	20cm Earth Temp	X
30cm Earth Temp	-	100cm Earth Temp	-
Dry Bulb Temp	X	Wet Bulb Temp	X
Grass Min Temp	X	Weather Phenomonen	-
Max Temp	X	Min Temp	X
Visibility	-	Cloud Amount	-
MSL Pressure	-		
Wind Run	-		
Time Offset (from UTC)	12	dayl_daylight_area	02

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

	Date	NH_4-N	BOD_5	ENT	FC	Temp	NOx	DRP	TP	TSS	TN	**BOD_5**	**TSS**	**FC**
		[mg/l]	[mg/l]	MPN/100ml	CFU/100ml	[deg C]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	CFU/100ml
Jul-13	3/07/2013	0.59	3.1		470	not given	12.0	1.5	2.3	8.0	14.8	6.1	8	470
Aug-13	7/08/2013	1.3	4.6	5	10	11.4	15.0	3.6	3.9	11.0	18.1	6.1	11	210
Sep-13	4/09/2013	1.7	6.3	5	5	11.7	18.0	4.2	4.1	12.0	21.0	6.2	12	180
Oct-13	1/10/2013	2.9	5.0	5	5	14.0	18.0	4.5	4.5	8.0	21.5	6.2	11	10
Nov-13	5/11/2013	15	6.3	10	5	17.0	7.4	5.2	11.0	14.0	24.4	6.3	11	5
Dec-13	5/12/2013	5.7	4.6	10	30	19.3	16.0	4.8	4.8	7.0	22.2	5.7	11	5
	11/12/2013	5.7	4.4	5	5	20.0	18.0	4.4	5.3	6.0	24.3	4.8	8	5
	18/12/2013	5.9	5.6	5	40	19.8	18.0	5.4	5.4	15.0	24.0	4.8	8	5
	27/12/2013	16	8.9	5	190	20.0	15.0	6.1	6.6	15.0	33.1	5.3	14	30
	30/12/2013	16	9.3	5	30	20.0	8.7	4.7	5.2	17.0	26.7	6.0	15	30
Jan-14	8/01/2014	19	6.3	5	10	20.8	6.3	6.5	7.2	16.0	26.3	6.0	15	30
	16/01/2014	15	7.0	5	5	20.0	20.0	7.3	7.8	18.0	35.0	6.3	16	30
	22/01/2014	8.0	6.9	10	5	19.3	22.0	6.0	6.8	17.0	29.8	6.6	17	10
	30/01/2014	5.2	6.8	20	30	19.8	18.0	5.4	6.2	11.0	25.1	6.9	17	10
Feb-14	5/02/2014	5.0	5.3	5	5	20.6	19.0	6.2	6.6	12.0	25.7	6.9	16	5
	13/02/2014	6.3	5.8	10	20	20.0	18.0	5.0	6.3	25.0	25.6	6.9	17	5
	20/02/2014	5.4	4.7	5	5	21.0	25.0	5.8	6.6	9.0	30.7	6.6	12	5
	28/02/2014	4.0	3.0	5	5	20.0	26.0	5.8	6.6	9.0	30.3	6.1	11	5
Mar-14	19/03/2014	1.9	4.8	20	160	18.7	13.0	2.9	3.1	11.0	16.2	5.6	11	5
Apr-14	16/04/2014	0.78	4.4	5	5	16.0	14.0	2.7	2.8	12.0	16.3	5.1	11	5
May-14	7/05/2014	0.7	3.1	5	10	15.0	7.7	2.6	3.1	11.0	10.0	4.8	11	5
Jun-14	3/06/2014	7.2	8.0	20	160	11.5	19.0	4.2	4.7	21.0	27.0	4.8	11	10
											Limit	30	30	1,000
		As	Cr	Cd	Cu	Zn	Ni	Pb			**Exceedances**	0	0	0
		[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]	[µg/l]						
Jan-14	8/01/2014	-	<1	0.43	17.0	70.0	-	2.8						

Removed < for calculations and halved the value.

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

	400m Shoreline North	400m Shoreline South	Shoreline nearest OF	400m Shoreline North	400m Shoreline South	Shoreline nearest OF	400m Shoreline North	400m Shoreline North	400m Shoreline South	400m Shoreline South	Shoreline nearest Outfall	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						
3/07/2013				4	1	4						
7/08/2013				13	9	5						
4/09/2013				1	1	1						
1/10/2013				0.5	0.5	0.5						
5/11/2013				2	0.5	2						
5/12/2013	5	10	5	3	1	0.5	8:10	0:10	8:05	0:15	8:00	0:20
11/12/2013	5	5	5	0.5	0.5	0.5	6:35	0:25	6:50	0:10	6:40	0:20
18/12/2013	110	20	10	290	7	4	7:45	-0:10	8:05	-0:30	7:55	-0:20
27/12/2013	5	5	5	1	0.5	1	8:20	0:10	8:25	0:05	8:15	0:15
30/12/2013	10	20	30	85	86	72	7:03	-0:26	6:57	-0:20	6:55	-0:18
8/01/2014	5	5	5	6	10	6	6:50	-0:18	6:45	-0:13	6:40	-0:08
16/01/2014	5	5	10	5	3	4	6:40	0:05	6:30	0:15	6:35	0:10
22/01/2014	10	5	30	1	6	15	7:19	-0:08	7:28	-0:17	7:22	-0:11
30/01/2014	5	10	5	5	5	5	8:15	-0:15	8:20	-0:20	8:10	-0:10
5/02/2014	5	5	10	1	5	0.5	6:35	0:25	6:45	0:15	6:40	0:20
13/02/2014	5	3700	30	116	180	69	6:55	0:10	6:45	0:20	6:50	0:15
20/02/2014	10	5	10	1	2	2	7:20	0:10	7:00	0:30	7:10	0:20
28/02/2014	30	10	20	4	3	1	7:30	-0:40	7:00	-0:10	7:10	-0:20
19/03/2014				11	12	9						
16/04/2014				14	2	4						
7/05/2014				6	6	16						
3/06/2014				2	0.5	2						
Removed < for calculations and halved the value.												
5 sample median of Summer samples >14				0	0	0						
# summer samples > 43				3	2	2						
% summer samples > 43				23.1%	15.4%	15.4%						
# total samples > 43	3	2	2									
% total samples > 43	13.6%	9.1%	9.1%									
# all summer samples > 43			7									
% all summer samples > 43			10.8									

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

	250 metres due north							250 metres due west							250 metres due south						
	Temp	TN	NOx	NH3	DIN	TP	DRP	Temp	TN	NOx	NH3	DIN	TP	DRP	Temp	TN	NOx	NH3	DIN	TP	DRP
	°C	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	°C	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	°C	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
TRIGGER				0.910	0.062		0.018				0.910	0.062		0.018				0.910	0.062		0.018
5/12/2013	16.9	0.140	0.130	0.003	0.133	0.034	0.041	16.9	0.005	0.005	0.003	0.008	0.010	0.008	16.9	0.005	0.005	0.003	0.008	0.010	0.011
30/12/2013	17.2	0.120	0.060	0.051	0.111	0.023	0.024	17.2	0.032	0.005	0.044	0.049	0.010	0.010	17.2	0.036	0.005	0.005	0.010	0.010	0.009
22/01/2014	15.5	0.120	0.005	0.005	0.010	0.034	0.010	15.5	0.120	0.029	0.012	0.041	0.029	0.012	15.5	0.150	0.005	0.005	0.010	0.037	0.009
20/02/2014	17.6	0.120	0.005	0.023	0.028	0.010	0.007	17.6	0.095	0.005	0.005	0.010	0.010	0.009	17.6	0.110	0.005	0.005	0.010	0.010	0.010

Removed < for calculations and halved the value.

	Plant Effluent				
	TN	NOx	NH3	TP	DRP
	mg/L	mg/L	mg/L	mg/L	mg/L
TRIGGER					
5/12/2013	22.20	16.00	5.70	4.80	4.80
30/12/2013	26.70	8.70	16.00	5.20	4.70
22/01/2014	29.80	22.00	8.00	6.80	6.00
20/02/2014	30.70	25.00	5.40	6.60	5.80

Removed < for calculations and halved the value.