Akaroa
Wastewater Treatment Plant
Annual Monitoring Report
July 2015 – June 2016

Prepared by: City Care Ltd
Kris Kaser

On behalf of:

Christchurch City Council, City Water & Waste Unit

29 August 2016

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.
	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 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).
	Compliant (Attachments 1.1, 1.2 and 2.1); >750m³ recorded on the 21 May 2016 following rainfall depth of 50mm.
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 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
	Non-compliant (Attachment 3.1); Three exceedances in January 2016 (2900, 2900, 37000 FC), and one exceedance in February 2016 (2,900).
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 BOD_5 (Attachment 3.1); maximum medians were 19 mg/l BOD_5 **Non compliance for TSS on 10 occasions with max 36 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.
	Compliant: ECAN was notified.
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.
	Unable to confirm Compliance
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.
	Compliance (Attachment 3.3)
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.
	Compliance
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
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.
	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

Flows into the Akaroa Wastewater Treatment Plant (WWTP) were affected by heavy rain and stormwater on the 21 May 2016. causing a discharge in excess of the 750-m^3/d dry weather maximum. For this event, over 50 mm of rainfall was recorded at the Akaroa EWS weather station (Agent number 36593) and the Wainui WWTP (Attachment 2.1). No exceedance of the 3,000-m^3/d wet weather maximum applied and flows were compliant. Flows through the plant were similar to the previous reporting period (i.e., 79,046 m^3 in 2014-2015 vs 76,973 m^3 in 2015-2016) the 95th percentile for flow recorded at 350 m^3/d (down from 400m^3/d in 2014/2015) (Attachment 1.3).

Plant performance relating to organic parameters BOD_5 was good, with no exceedances above the 30-mg/L median limits for effluent quality, however TSS levels exceeded 30 on 10 occasions (max =36) (Table 1).

Four faecal coliform (FC) exceedances were recorded over the summer period when an increased loading was received at the plant considered to coincide with the high summer seasonal holiday population.

Receiving Environment Monitoring

Some trigger limits were exceeded for human-health related parameters (Attachment 3.2). An average of 5.1% of FC samples were >43 CFU/100mL. All location medians were <14 CFU/100mL FC.

Nutrient data gathered from the receiving environment did not exceed trigger values at any locations for DIN (Attachment 3.3).

Table 1. Summary of Monitoring Non-Compliances from July 2015-June 2016.

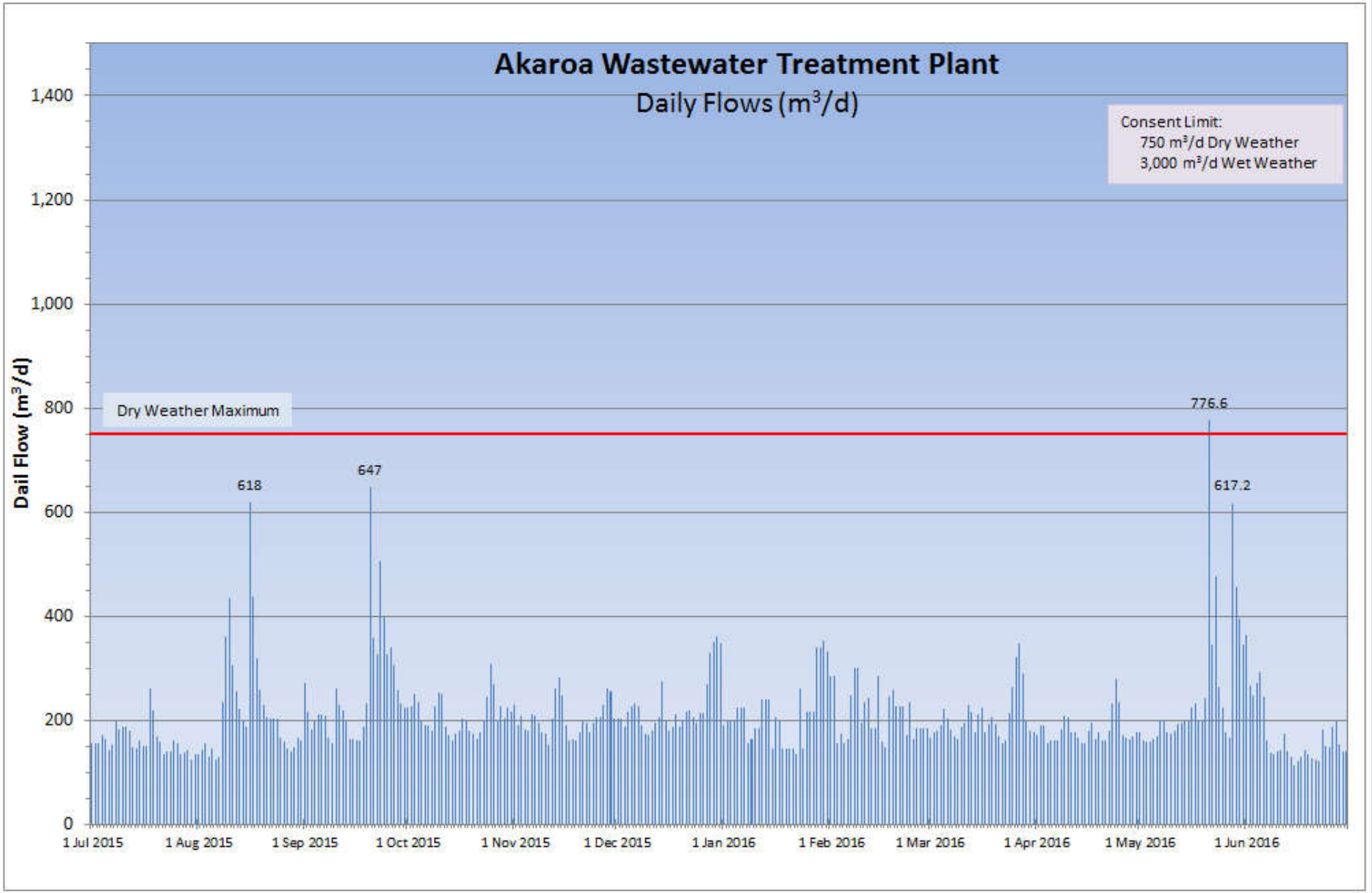
Treatment Plant Effluent			
Parameter	**Single Samples Exceeding Limit**	**Median Limit Exceedances**	**Condition Non-Compliances**
Dry Weather Flow > 750 m3/d	1	-	1
Wet Weather Flow > 3,000 m3/d	0	-	
BOD_5 > 30 mg/L	0	0	0
TSS > 30 mg/L	0	10	
FC > 1,000 CFU/100 mL	4	4	4
Receiving Environment			
Parameter	**Single Samples Exceeding Limit**	**Median Limit or % Exceedances**	**Condition Non-Compliances**
Summer FC > 14 CFU/100 mL	2	0	4
<10% Summer FC > 43 CFU/100 mL	2	0	
DIN > 0.062 mg/L	0	0	0
DRP median > 0.018 mg/L	0	0	
NH3 median > 0.910 mg/L	0	0	

Attachment 1.1: Flows, Akaroa, Data

Plant	Akaroa Wastewater Treatment, Banks Peninsula: Daily Flows for July 2015 - June 2016						
Date	Flow (m^3/d)	Date	Flow (m^3/d)	Date	Flow (m^3/d)	Date	Flow (m^3/d)
1 Jul 2015	157	1 Oct 2015	223	1 Jan 2016	191	1 Apr 2016	172
2 Jul 2015	156	2 Oct 2015	228	2 Jan 2016	201	2 Apr 2016	190
3 Jul 2015	156	3 Oct 2015	250	3 Jan 2016	201	3 Apr 2016	190
4 Jul 2015	172	4 Oct 2015	235	4 Jan 2016	201	4 Apr 2016	156
5 Jul 2015	164	5 Oct 2015	198	5 Jan 2016	225	5 Apr 2016	162
6 Jul 2015	143	6 Oct 2015	190	6 Jan 2016	225	6 Apr 2016	162
7 Jul 2015	153	7 Oct 2015	190	7 Jan 2016	225	7 Apr 2016	162
8 Jul 2015	199	8 Oct 2015	180	8 Jan 2016	156	8 Apr 2016	181
9 Jul 2015	183	9 Oct 2015	226	9 Jan 2016	165	9 Apr 2016	208
10 Jul 2015	186	10 Oct 2015	253	10 Jan 2016	184	10 Apr 2016	207
11 Jul 2015	188	11 Oct 2015	252	11 Jan 2016	184	11 Apr 2016	177
12 Jul 2015	179	12 Oct 2015	188	12 Jan 2016	240	12 Apr 2016	177
13 Jul 2015	148	13 Oct 2015	173	13 Jan 2016	240	13 Apr 2016	166
14 Jul 2015	145	14 Oct 2015	163	14 Jan 2016	240	14 Apr 2016	157
15 Jul 2015	160	15 Oct 2015	175	15 Jan 2016	145	15 Apr 2016	155
16 Jul 2015	151	16 Oct 2015	181	16 Jan 2016	205	16 Apr 2016	179
17 Jul 2015	151	17 Oct 2015	204	17 Jan 2016	197	17 Apr 2016	196
18 Jul 2015	262	18 Oct 2015	200	18 Jan 2016	145	18 Apr 2016	165
19 Jul 2015	218	19 Oct 2015	178	19 Jan 2016	145	19 Apr 2016	176
20 Jul 2015	170	20 Oct 2015	175	20 Jan 2016	145	20 Apr 2016	161
21 Jul 2015	159	21 Oct 2015	164	21 Jan 2016	145	21 Apr 2016	161
22 Jul 2015	135	22 Oct 2015	177	22 Jan 2016	135	22 Apr 2016	180
23 Jul 2015	140	23 Oct 2015	197	23 Jan 2016	260	23 Apr 2016	231
24 Jul 2015	141	24 Oct 2015	245	24 Jan 2016	146	24 Apr 2016	279
25 Jul 2015	161	25 Oct 2015	309	25 Jan 2016	217	25 Apr 2016	234
26 Jul 2015	155	26 Oct 2015	270	26 Jan 2016	217	26 Apr 2016	171
27 Jul 2015	135	27 Oct 2015	197	27 Jan 2016	217	27 Apr 2016	166
28 Jul 2015	137	28 Oct 2015	227	28 Jan 2016	340	28 Apr 2016	164
29 Jul 2015	143	29 Oct 2015	204	29 Jan 2016	340	29 Apr 2016	170
30 Jul 2015	123	30 Oct 2015	225	30 Jan 2016	354	30 Apr 2016	178
31 Jul 2015	136	31 Oct 2015	217	31 Jan 2016	332	1 May 2016	177.1
1 Aug 2015	136	1 Nov 2015	231	1 Feb 2016	284	2 May 2016	162.4
2 Aug 2015	143	2 Nov 2015	191	2 Feb 2016	284	3 May 2016	157.8
3 Aug 2015	157	3 Nov 2015	209	3 Feb 2016	155	4 May 2016	157.6
4 Aug 2015	130	4 Nov 2015	181	4 Feb 2016	175	5 May 2016	163
5 Aug 2015	145	5 Nov 2015	180	5 Feb 2016	155	6 May 2016	169.1
6 Aug 2015	125	6 Nov 2015	212	6 Feb 2016	164	7 May 2016	197.7
7 Aug 2015	131	7 Nov 2015	210	7 Feb 2016	247	8 May 2016	199.7
8 Aug 2015	234	8 Nov 2015	197	8 Feb 2016	301	9 May 2016	176.2
9 Aug 2015	361	9 Nov 2015	176	9 Feb 2016	301	10 May 2016	174.5
10 Aug 2015	435	10 Nov 2015	175	10 Feb 2016	196	11 May 2016	178.7
11 Aug 2015	307	11 Nov 2015	155	11 Feb 2016	236	12 May 2016	192.5
12 Aug 2015	255	12 Nov 2015	204	12 Feb 2016	244	13 May 2016	194.4
13 Aug 2015	222	13 Nov 2015	262	13 Feb 2016	185	14 May 2016	200.5
14 Aug 2015	198	14 Nov 2015	283	14 Feb 2016	185	15 May 2016	197.5
15 Aug 2015	189	15 Nov 2015	248	15 Feb 2016	286	16 May 2016	225.1
16 Aug 2015	618	16 Nov 2015	191	16 Feb 2016	159	17 May 2016	231
17 Aug 2015	437	17 Nov 2015	160	17 Feb 2016	148	18 May 2016	196.9
18 Aug 2015	319	18 Nov 2015	164	18 Feb 2016	246	19 May 2016	197.6

Date	Flow (m^3/d)	Date	Flow (m^3/d)	Date	Flow (m^3/d)	Date	Flow (m^3/d)
19 Aug 2015	260	19 Nov 2015	160	19 Feb 2016	258	20 May 2016	241.5
20 Aug 2015	231	20 Nov 2015	177	20 Feb 2016	228	21 May 2016	**776.6**
21 Aug 2015	205	21 Nov 2015	200	21 Feb 2016	228	22 May 2016	346.6
22 Aug 2015	204	22 Nov 2015	197	22 Feb 2016	228	23 May 2016	476
23 Aug 2015	203	23 Nov 2015	177	23 Feb 2016	171	24 May 2016	263.9
24 Aug 2015	204	24 Nov 2015	196	24 Feb 2016	235	25 May 2016	225.1
25 Aug 2015	165	25 Nov 2015	207	25 Feb 2016	165	26 May 2016	175.8
26 Aug 2015	158	26 Nov 2015	207	26 Feb 2016	184	27 May 2016	167.4
27 Aug 2015	146	27 Nov 2015	229	27 Feb 2016	184	28 May 2016	617.2
28 Aug 2015	139	28 Nov 2015	261	28 Feb 2016	184	29 May 2016	455.5
29 Aug 2015	148	29 Nov 2015	256	29 Feb 2016	184	30 May 2016	394.6
30 Aug 2015	168	30 Nov 2015	203	1 Mar 2016	167	31 May 2016	344.3
31 Aug 2015	162	1 Dec 2015	203	2 Mar 2016	176	1 Jun 2016	364.8
1 Sep 2015	273	2 Dec 2015	203	3 Mar 2016	179	2 Jun 2016	267.4
2 Sep 2015	217	3 Dec 2015	187	4 Mar 2016	189	3 Jun 2016	248.7
3 Sep 2015	183	4 Dec 2015	217	5 Mar 2016	221	4 Jun 2016	271.5
4 Sep 2015	198	5 Dec 2015	226	6 Mar 2016	204	5 Jun 2016	291.5
5 Sep 2015	211	6 Dec 2015	233	7 Mar 2016	182	6 Jun 2016	246.7
6 Sep 2015	212	7 Dec 2015	228	8 Mar 2016	170	7 Jun 2016	162.4
7 Sep 2015	208	8 Dec 2015	191	9 Mar 2016	163	8 Jun 2016	137.8
8 Sep 2015	166	9 Dec 2015	175	10 Mar 2016	187	9 Jun 2016	134.8
9 Sep 2015	157	10 Dec 2015	172	11 Mar 2016	196	10 Jun 2016	139.4
10 Sep 2015	262	11 Dec 2015	179	12 Mar 2016	229	11 Jun 2016	142.2
11 Sep 2015	230	12 Dec 2015	196	13 Mar 2016	217	12 Jun 2016	174.5
12 Sep 2015	218	13 Dec 2015	207	14 Mar 2016	178	13 Jun 2016	140.7
13 Sep 2015	199	14 Dec 2015	274	15 Mar 2016	211	14 Jun 2016	129.5
14 Sep 2015	163	15 Dec 2015	199	16 Mar 2016	225	15 Jun 2016	113.4
15 Sep 2015	163	16 Dec 2015	179	17 Mar 2016	177	16 Jun 2016	121.4
16 Sep 2015	162	17 Dec 2015	187	18 Mar 2016	192	17 Jun 2016	128.9
17 Sep 2015	160	18 Dec 2015	210	19 Mar 2016	206	18 Jun 2016	141.8
18 Sep 2015	187	19 Dec 2015	186	20 Mar 2016	194	19 Jun 2016	133.8
19 Sep 2015	232	20 Dec 2015	200	21 Mar 2016	170	20 Jun 2016	127.7
20 Sep 2015	647	21 Dec 2015	216	22 Mar 2016	155	21 Jun 2016	124.6
21 Sep 2015	359	22 Dec 2015	219	23 Mar 2016	161	22 Jun 2016	123
22 Sep 2015	328	23 Dec 2015	206	24 Mar 2016	213	23 Jun 2016	181.6
23 Sep 2015	506	24 Dec 2015	196	25 Mar 2016	265	24 Jun 2016	152
24 Sep 2015	401	25 Dec 2015	215	26 Mar 2016	321	25 Jun 2016	146.9
25 Sep 2015	328	26 Dec 2015	214	27 Mar 2016	348	26 Jun 2016	187.5
26 Sep 2015	340	27 Dec 2015	270	28 Mar 2016	289	27 Jun 2016	198.7
27 Sep 2015	306	28 Dec 2015	329	29 Mar 2016	197	28 Jun 2016	153.6
28 Sep 2015	259	29 Dec 2015	351	30 Mar 2016	180	29 Jun 2016	140.1
29 Sep 2015	232	30 Dec 2015	361	31 Mar 2016	177	30 Jun 2016	139.7
30 Sep 2015	225	31 Dec 2015	347				

Attachment 1.2: Flows, Akaroa, Chart



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

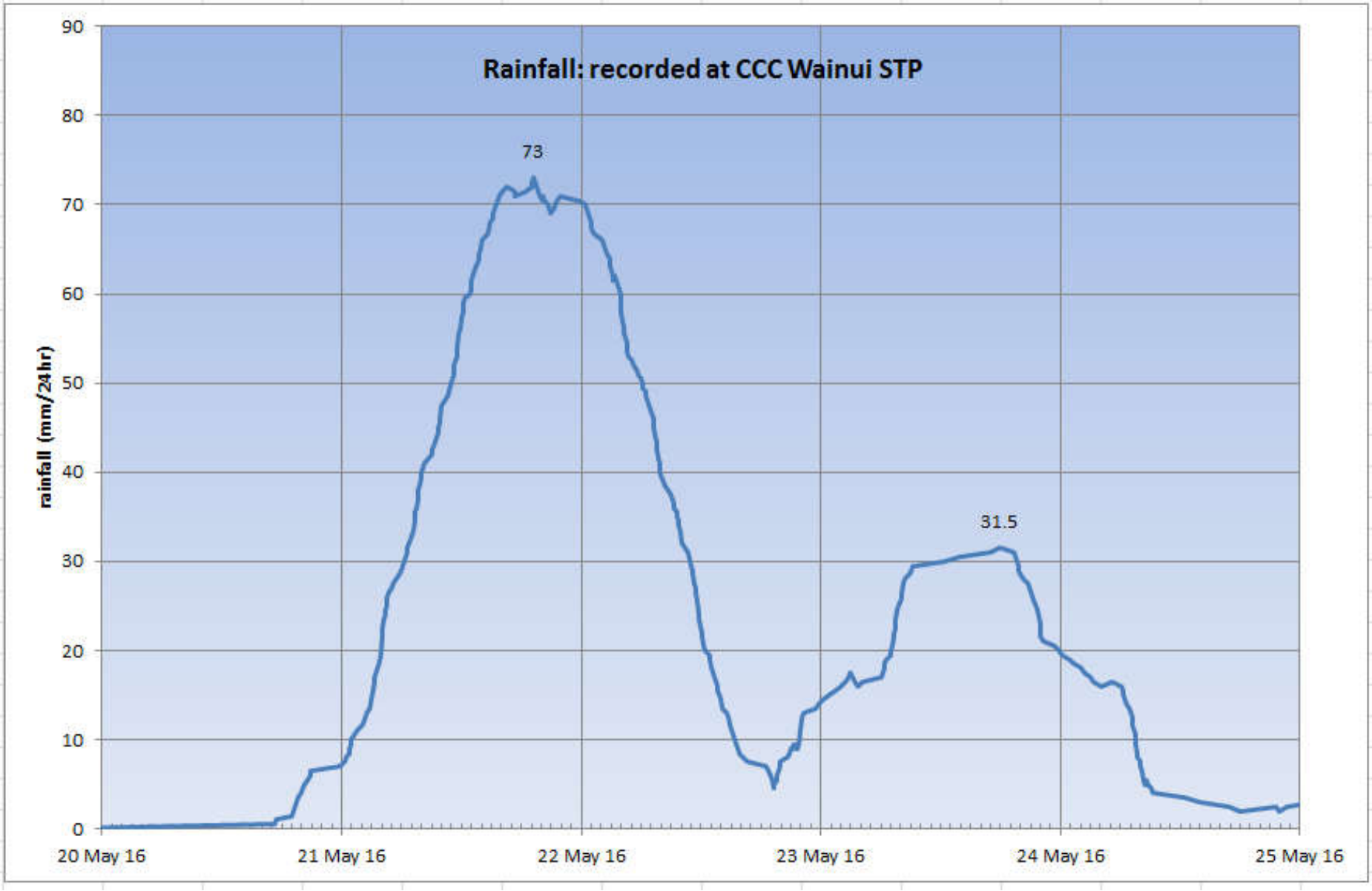
Attachment 2.1: Rainfall data

Station information:							
Name	Agent Number	Network Number	Latitude (dec.deg)	Longitude (dec.deg)	Height (m)	Posn_Pre(	Observing Authority
Akaroa Ews	36593	H32895	-43.809	172.966	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)**	**Amount(mm)**
36593	20160518:0900	4.2
36593	20160519:0900	4.8
36593	20160520:0900	-
36593	20160521:0900	50.4
36593	20160522:0900	41.8
36593	20160523:0900	23.0
36593	20160524:0900	7.6

Attachment 2.2: Rainfall data, Wainui



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**

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]	5-Sample Median BOD_5 [mg/l]	5-Sample Median TSS [mg/l]	5-Sample Median FC CFU/100ml
8 Jul 2015	5.8	10.0	10	10	9.2	19.0	2.8	3.6	28.0	4.0	10.0	23	10
4 Aug 2015	3.7	8.9	10	10	11.0	25.0	3.3	4.0	22.0	3.6	9.5	25	10
1 Sep 2015	2.9	7.4	10	10	12.0	11.0	2.8	3.6	31.0	4.3	8.9	28	10
7 Oct 2015	13.0	7.2	10	10	14.4	10.0	3.2	4.0	15.0	14.0	8.2	25	10
4 Nov 2015	22.0	9.3	10	10	18.5	15.0	3.2	3.8	20.0	24.0	8.9	22	10
2 Dec 2015	24.0	11.0	120	190	15.0	10.0	3.2	5.2	21.0	36.0	8.9	21	10
9 Dec 2015	20.0	8.4	63	100	17.0	12.0	4.6	6.9	13	35.0	8.4	20	10
16 Dec 2015	17.0	7.6	10	10	15.0	11.0	3.3	4.4	19	31.0	8.4	19	10
23 Dec 2015	19.0	14.0	30	110	18.0	7.2	3.6	5.1	25.0	30.0	9.3	20	100
30 Dec 2015	39.0	19.0	20,000	99,000	17.0	3.4	5.2	7.6	35.0	55.0	11.0	21	110
6 Jan 2016	29.0	60.0	2,900	37,000	16.0	4.3	4.3	7.6	35.0	45.0	14.0	25	110
13 Jan 2016	24.0	12.0	6,300	2,900	18.0	7.3	4.9	6.7	33.0	35.0	14.0	33	2,900
20 Jan 2016	17.0	4.1	41	800	18.0	7.5	4.2	6.8	34.0	29.0	14.0	34	2,900
27 Jan 2016	19.0	45.0	24,000	60,000	17.0	0.1	3.6	7.7	77.0	29.0	19.0	35	37,000
3 Feb 2016	8.9	6.5	10	10	18.0	19.0	4.5	9.0	29	28.0	12.0	34	2,900
10 Feb 2016	18.0	8.3	160	320	19.0	12.0	4.6	5.7	36	20.0	8.3	34	800
17 Feb 2016	12.0	6.4	20	10	20.0	16.0	2.5	5.8	37.0	29.0	6.5	36	320
23 Feb 2016	9.0	4.8	10	10	17.2	17.0	1.5	4.4	22.0	28.0	6.5	36	10
14 Mar 2016	9.8	5.6	10	10	19.0	22.0	3.5	3.9	31.0		6.4	31	10
11 Apr 2016	8.9	4.6	10	10	18.0	28.0	3.1	5.4	35.0		5.6	35	10
10 May 2016	1.7	2.4	10	10	16.0	23.0	1.6	2.3	14.0		4.8	31	10
21 Jun 2016	1.5	2.5	10	10	12.0	23.0	1.1	2.4	3.0		4.6	22	10
										Limit	30	30	1,000
										Exceedances	0	**10**	**4**
										Max	19.0	36.0	37,000

	As [mg/l]	Cd [mg/l]	Cr [mg/l]	Cu [mg/l]	Pb [mg/l]	Ni [mg/l]	Zn [mg/l]
6 Jan 2016		<0.00020	<0.001	0.013	<0.0015		0.045

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

Akaroa STP	STP	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
	Sample Time	ENT MPN/100ml	ENT MPN/100ml	ENT MPN/100ml	FC CFU/100ml	FC CFU/100ml	FC CFU/100ml	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
8 Jul 2015	13:15				<1	<1	<1	13:25	0:10	13:30	0:10	13:20	0:05
4 Aug 2015	10:00				<1	<1	<1	10:45	0:45	10:05	0:20	10:10	0:10
1 Sep 2015	10:00				<1	<1	<1	10:20	0:20	10:10	0:20	10:15	0:15
7 Oct 2015	6:30				1	1	1	6:25	0:05	6:15	0:15	6:20	0:10
4 Nov 2015	5:30				3	1	<1	5:40	0:10	5:50	0:10	5:45	0:05
2 Dec 2015	10:00	<10	<1	<10	<1	<10	<1	9:30	0:30	9:30	0:30	9:30	0:30
9 Dec 2015	9:45	<10	<10	<10	<1	<1	<1	9:45		9:45		9:45	
16 Dec 2015	9:00	<10	<10	<10	<1	<1	2	9:00		9:00		9:00	
23 Dec 2015	7:30	<10	<10	<10	6	<1	47	7:30		7:30		7:30	
30 Dec 2015	8:30	<10	<10	<10	<1	<1	<1	8:40	0:10	8:40	0:10	8:40	0:10
6 Jan 2016	10:00	<10	<10	<10	<1	<1	<1	10:00		10:00		10:00	
13 Jan 2016	8:45	<10	<10	10	<1	<1	79	8:45		8:45		8:45	
20 Jan 2016	8:30	<10	<10	<10	9	<1	<1	8:30		8:30		8:30	
27 Jan 2016	8:50	<10	<10	10	<1	2	1	8:50		8:50		8:50	
3 Feb 2016	7:30	<10	<10	<10	7	<1	<1	7:50	0:10	7:50	0:20	7:50	0:20
10 Feb 2016	8:45	<10	<10	<10	<1	4	2	8:45		8:45		8:45	
17 Feb 2016	8:15	<10	<10	<10	1	0	1	8:15		8:15		8:15	
23 Feb 2016	15:00	<10	<10	<10	<1	<1	<1	15:00		15:00		15:00	
14 Mar 2016	7:50				<2	2	2	8:20	0:30	8:10	0:30	8:00	0:10
11 Apr 2016	9:30				<2	<2	2	9:00	0:30	8:50	0:40	8:55	0:35
10 May 2016	10:00				<1	<1	1	9:50	0:10	9:30	0:30	9:40	0:20
21 Jun 2016	8:35				2	1	2	8:55	0:20	8:45	0:20	8:50	0:15
5 sample median of Summer samples >14					0	0	0						
# summer samples > 43					0	0	2						
% summer samples > 43					0.0%	0.0%	15.4%						
# total samples > 43		0	0	0	0	0	2						
% total samples > 43		0.0%	0.0%	0.0%	0.0%	0.0%	9.1%						
# all summer samples > 43							*2*						
% all summer samples > 43							*5.1*						

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

Date	250 metres due North							250 metres due West							250 metres due South						
	Temp °C	TN mg/L	NOx mg/L	NH3 mg/L	DIN 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	Temp °C	TN mg/L	NOx mg/L	NH3 mg/L	DIN mg/L	TP mg/L	DRP mg/L
TRIGGER				0.910	0.062		0.018				0.910	0.062		0.018				0.910	0.062		0.018
2-Dec-2015	15.0	0.140	0.010	0.009	0.019	0.002	0.009	15.0	0.014	0.010	0.009	0.019	0.036	0.013	15.0	0.140	0.010	0.007	0.017	0.014	0.0078
30-Dec-2015	15.0	0.190	0.010	0.014	0.024	0.020	0.014	15.0	0.110	0.010	0.005	0.015	0.018	0.009	15.0	0.170	0.011	0.021	0.032	0.028	0.0140
27-Jan-2016	17.0	0.077	0.010	0.005	0.015	0.028	0.009	17.0	0.072	0.010	0.005	0.015	0.027	0.0098	17.0	0.073	0.010	0.005	0.015	0.025	0.0086
10-Feb-2016	17.0	0.016	0.010	0.005	0.015	0.015	0.008	17.0	0.180	0.010	0.005	0.015	0.008	0.011	17.0	0.190	0.010	0.005	0.015	0.017	0.0096

	Plant Effluent				
	TN	NOx	NH3	TP	DRP
	mg/L	mg/L	mg/L	mg/L	mg/L
2-Dec-2015	36.0	10.0	24.0	5.2	3.2
30-Dec-2015	55.0	3.4	39.0	7.6	5.2
27-Jan-2016	29.0		19.0	7.7	3.6
10-Feb-2016	20.0	12.0	18.0	5.7	4.6