



# Diamond Harbour Wastewater Treatment Plant Annual Monitoring Report 07/2014 – 06/2015

Prepared by: City Care Ltd  
Kevin Willers

On behalf of

Christchurch City Council, City Water & Waste Unit

26 August 2014

**Resource Consent Number:** CRC101835  
**File Number:** CO6C/14460  
**Client Name:** Christchurch City Council  
**To:** Discharge contaminants into water.  
**Consent Location:** Pauahinekotou Head, LYTTELTON HARBOUR  
**Status:** Active

07/08/2012 Consent Commenced  
 07/08/2017 Lapse Date  
 03/09/2012 Given Effect to Date  
 31/12/2021 Expiry Date

**Subject to the Following Conditions:**

<b>1</b>	The discharge shall be only treated sewage from the Diamond Harbour Wastewater Treatment Plant, located at the based of Pauahinekotou Head, Diamond Harbour.
	<b>Non-compliance; heavy rain and stormwater flows required the UV system to be partially bypassed on the 04/06/15. A portion of the effluent flow discharged to the harbour was not fully treated during this period.</b>
<b>2</b>	a. Treated sewage effluent shall only be discharged to Lyttelton Harbour/Whakaraupo via an existing outfall approximately 60 metres seaward from Pauahinekotou Head, at or about map reference NZMS 260 M36: 8729-3141. b. The discharge at this location shall cease on 31 December 2021.
	<b>Compliance</b>
<b>3</b>	The volume of effluent discharged shall not exceed 2500 cubic metres per day at a maximum rate of 34 litres per second.
	<b>Unable to confirm compliance; the instantaneous inflow flowrate exceeded the consented limit of 34l/s 737 times during the twelve month period, primarily due to extreme rain events and the pumped nature of the incoming flows. The peak flows through the treatment plant will be buffered through the large treatment tanks in the treatment plant prior to UV disinfection and discharge into the harbour. At present there is no flow meter on the discharge pipework. The maximum discharge of 2500 m<sup>3</sup> per day was not exceeded (Attachment 1.1).</b>
<b>4</b>	The consent holder shall measure flows from the Diamond Harbour Sewage Treatment Plant, on a continuous basis, to a degree of accuracy of plus or minus ten percent, and shall maintain a record of total daily flows. This record shall be made available to the Canterbury Regional Council on request.
	<b>Compliance</b>
<b>5</b>	The median concentration of the five-day biological oxygen demand in the effluent discharged shall not exceed 30 grams per cubic metre from the date of commencement of this consent.
	<b>Compliance; median maximum BOD<sub>5</sub> = 4.7 mg/L</b>
<b>6</b>	The median concentration of the suspended solids in the effluent discharged shall not exceed 30 grams per cubic metre from the date of commencement of this consent.
	<b>Compliance; median maximum TSS = 16.0 mg/L</b>
<b>7</b>	a. The median concentration of faecal coliforms shall not exceed 700 colony forming units (CFU) per 100 millilitres of effluent. b. The median concentration of enterococci shall not exceed 1,750 MPN per 100 millilitres of effluent.
	<b>Complies; median maximums FC = 75 CFU/100 mL and ENT = 76 MPN/100 mL</b>
<b>8</b>	For the purposes of determining whether the consent holder is complying with Conditions (5), (6) and (7): a. The effluent shall be sampled at any point after treatment and prior to discharge, and analysed for the concentration of the five-day biological oxygen demand, suspended solids, faecal coliforms and enterococci. b. The effluent shall be sampled at the following frequency: i. At least monthly samples shall be taken from 1 March to 30 November; and ii. At least weekly samples, on separate days selected at random, shall be taken during December, January and February. c. For the purposes of Conditions (5), (6) and (7), whenever a new sample result is available for each determinand, it shall be grouped with the previous four results obtained under Conditions (8)(a) and (b) or Condition (9), and the median result recorded. d. The time of day samples are taken shall be recorded.
	<b>Compliance</b>
<b>9</b>	If any sample measured has a faecal coliform count greater than 700 faecal coliforms per 100 millilitres of effluent or an

	enterococci count or more than 1,750 MPN per 100 millilitres of effluent, the consent holder shall take a further sample of treated effluent within two days of obtaining that result and shall test for faecal coliform and enterococci concentrations.
	<b>Compliance; sampling undertaken on two occasions</b>
10	If the median concentration of faecal coliforms or enterococci, as calculated in accordance with Condition 8(c), exceeds 700 faecal coliforms per 100 millilitres or 1,750 enterococci per 100 millilitres of effluent, the consent holder shall within ten working days of the exceedance, write to the Canterbury Regional Council outlining the measures the consent holder proposes to undertake to address the concentration exceedances, and the timeframe within which this will occur.
	<b>Compliance; no exceedances occurred for either parameter</b>
11	Prior to discharge, the effluent shall be sampled and analysed not less than once per month for the following: <ul style="list-style-type: none"> <li>a. Dissolved reactive phosphorous (grams per cubic metre);</li> <li>b. Ammoniacal nitrogen (grams per cubic metre);</li> <li>c. Total oxidized nitrogen (grams per cubic metre); and</li> <li>d. Total nitrogen (grams per cubic metre).</li> </ul>
	<b>Compliance</b>
12	Prior to discharge, the effluent shall be sampled at least annually during January and analysed for the following: <ul style="list-style-type: none"> <li>a. Arsenic (milligrams per cubic metre);</li> <li>b. Cadmium (milligrams per cubic metre);</li> <li>c. Chromium (milligrams per cubic metre);</li> <li>d. Copper (milligrams per cubic metre);</li> <li>e. Lead (milligrams per cubic metre);</li> <li>f. Nickel (milligrams per cubic metre); and</li> <li>g. Zinc (milligrams per cubic metre).</li> </ul>
	<b>Compliance</b>
13	<ul style="list-style-type: none"> <li>a. The water of the receiving environment shall be sampled in January, March, May, June, September, November and December, at each of the following locations: <ul style="list-style-type: none"> <li>i. 50 metres due north of the outfall;</li> <li>ii. 50 metres due south of the outfall;</li> <li>iii. 50 metres due east of the outfall;</li> <li>iv. 50 metres due west of the outfall; and</li> <li>v. surface water quality monitoring site SQ35187 (which is located at or about NZMS 260: M36:8636-3190, east of Quail Island/Otamahua).</li> <li>vi. surface water quality monitoring site at Church Bay, which is located at or about NZMS 260 M36:872-305.</li> </ul> </li> <li>b. Each sample shall be analysed for the concentration of faecal coliforms, enterococci, total suspended solids, chlorophyll-a, ammoniacal nitrogen, total oxidized nitrogen total nitrogen and dissolved reactive phosphorus. The time the samples are taken shall be recorded.</li> <li>c. Samples shall be taken at approximately 0.5 metres below the surface of the water.</li> <li>d. Samples shall not be taken on consecutive days.</li> <li>e. Samples shall be taken within one hour of low water.</li> </ul>
	<b>Compliance</b>
14	If any of the samples collected from around the mixing zone in accordance with Condition (13) contain concentrations of total nitrogen greater than 1.0 mgN/l or ammoniacal nitrogen greater than 0.91 mgN/l, the consent holder shall undertake an investigation of the operation of the Wastewater Treatment Plant and shall re-sample the discharge for ammoniacal nitrogen, total oxidized nitrogen, total nitrogen and dissolved reactive phosphorus, within 48 hours of receiving the results of the initial survey. The consent holder shall report the findings of the investigation to Canterbury Regional Council within one week of receipt of the results of the re-sample.
	<b>Compliance</b>
15	The monitoring required under Condition (13) shall be undertaken on the same day as the monitoring required under Condition (8). In the event that the monitoring required under Conditions (13) and (8) cannot be undertaken on the same days, the reason shall be recorded and submitted to the Canterbury Regional Council.
	<b>Compliance</b>
16	The sediment survey as carried out by Golders Associates (Report Number: 0978205527 – January 2010) for the application shall be repeated in 2015 in the month of November. The samples shall be analysed for total organic carbon, copper, lead and zinc and shall be collected from the following locations: <ul style="list-style-type: none"> <li>a. At distances 25 metres perpendicular to the outfall; and</li> <li>b. At 50 metres and 150 metres along a transect in the same trajectory as the outfall pipe.</li> </ul> These locations are illustrated on Plan CRC101835A which forms part of this consent.
	<b>CCC to follow up</b>
17	The laboratory carrying out the analyses for the purposes of Conditions (5), (6), (7), (9), (11), (12) and (13) of this consent shall be 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.
	<b>Compliance</b>

<b>18</b>	The consent holder shall submit to the Canterbury Regional Council: <ul style="list-style-type: none"> <li>a. The results of any monitoring required each month under the conditions of this consent, by the 10<sup>th</sup> working day of the following month.</li> <li>b. The results of any sampling undertaken under Condition (9) that have a faecal coliform count greater than 700 faecal coliforms per 100 millilitres of effluent, or an enterococci count greater than 1,750 enterococci MPN per 100 millilitres of effluent, within three working days of receipt of any results.</li> </ul>
<b>Compliance</b>	
<b>19</b>	The consent holder shall submit to the Canterbury Regional Council within three months of the commencement of this consent, a Management Plan. This shall include: <ul style="list-style-type: none"> <li>a. An Operation and Maintenance Manual, which contains the key operation and maintenance tasks of the operator, normal operations, emergency operations and safety precautions. The emergency operations and safety precautions shall set out: <ul style="list-style-type: none"> <li>i. The contingency measures to be taken at the pumping stations in the Diamond Harbour Wastewater Treatment Plant catchment and at the Treatment Plant in order to avoid the release of effluent to the environment during periods of any mechanical or electrical failure or power cut; and</li> <li>ii. the measures to be taken at the pumping stations in the Diamond Harbour catchment and at the Treatment Plant in the event of an emergency discharge or overflow.</li> </ul> </li> <li>b. The Management Practices to ensure compliance with conditions of the Resource Consent.</li> <li>c. The Maintenance Contractor's monitoring programme and reporting provisions, including a specific requirement that monitoring is undertaken in accordance with Conditions (8), (9), (10), (11), (12), (13) (14), (15) and (16) of this consent.</li> </ul>
<b>Compliance; Management Plan submitted on 05/11/2012</b>	
<b>20</b>	<ul style="list-style-type: none"> <li>a. The consent holder shall submit a report to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, and upload the report on the consent holder's website by 31 August of each year summarizing the monitoring data collected and providing an interpretation of the results of the monitoring.</li> <li>b. The consent holder shall supply a copy of the report referred to in condition 20(a) to all the following organisations/groups/people: <ul style="list-style-type: none"> <li>a. Cass Bay Residents Association</li> <li>b. Church Bay Neighborhood Association</li> <li>c. Diamond Harbour Community Association Incorporated</li> <li>d. Paula Smith C/o 1 Purau Avenue, RD 2, Diamond Harbour</li> <li>e. Te Hapu o Ngati Wheke (Rapaki) Runanga</li> <li>f. Te Runanga o Koukourarata</li> <li>g. Te Runanga o Ngai Tahu</li> <li>h. Governors Bay Community Association.</li> </ul> </li> <li>c. The consent holder shall display all effluent and receiving environment monitoring data collected on the consent holder's website. This data shall be updated on a monthly basis.</li> </ul>
<b>Compliance via this report; CCC to distribute</b>	
<b>21</b>	<ul style="list-style-type: none"> <li>a. Within 60 days of the commencement date of this resource consent, the consent holder shall prepare an implementation plan which includes, but is not limited to the following matters: <ul style="list-style-type: none"> <li>a. No later than 30 June 2015 all preliminary design details have been completed;</li> <li>b. No later than 30 September 2015, all necessary resource consents have been applied for</li> <li>c. No later than 30 June 2017 detailed design work completed;</li> <li>d. No later than 31 December 2021 all works have been commissioned, and after a period of testing the treatment plant is decommissioned.</li> </ul> </li> <li>b. The consent holder shall provide an annual report to the Canterbury Regional Council in July each year, outlining progress on the Implementation Plan for the removal of the sewage discharge from Lyttelton Harbour/Whakaraupo. A copy of this annual report will also be forwarded to all organisations/groups represented on the Lyttelton Harbour/Whakaraupo Wastewater Working Party and also all parties listed in condition 20(b).</li> <li>c. The consent holder shall hold a public meeting once a year to discuss the monitoring data collected in the previous year and also to provide an update on progress relating to the cessation of the discharge at map reference NZMS 260 M36:838-815 on 31 December 2018, and the removal of the sewage discharge from Lyttelton Harbour/Whakaraupo.</li> </ul>
<b>CCC to follow up</b>	
<b>22</b>	The Canterbury Regional Council may, once per year, on any of the last five working days of June or November each year, serve notice of its intention to review the conditions of this consent for the purposes of: <ul style="list-style-type: none"> <li>a. Dealing with any adverse effects which may arise from the exercise of this consent and which it is appropriate to deal with later; or</li> <li>b. Requiring adoption of the best practicable option to remove or reduce any adverse effect on the environment; or</li> <li>c. Complying with the requirements of a relevant rule in an operative regional plan; or</li> <li>d. Amending the frequency of monitoring and the parameters monitored.</li> </ul>
<b>ECAN to request</b>	
<b>23</b>	The consent holder shall surrender resource consent CRC031546 within 60 working days of the commencement of this consent.
<b>Compliance</b>	

### **Treatment Plant Effluent Monitoring**

Daily flows for the Diamond Harbour Wastewater Treatment Plant (WwTP) were generally well under the 2,500 m<sup>3</sup>/d limit with 95% of all flows <600 m<sup>3</sup>/d (Attachment 1.3). Heavy rain in June 2015 resulted in a plant flow of 2064 m<sup>3</sup>/d, well within the consented limit.

The instantaneous inflow rate was greater than 34 L/s 737 times, although the discharge rate is currently not accurately measured. The majority of the exceedances were during the two large rainfall events in June 2015. Other smaller rain events and possible superposition of various processes occurring simultaneously overloaded the network at other times. These events were usually short-lived and uncharacteristic of the normal flow regime. Overall, flowrate compliance was greater compared to last year's 173 exceedances due to more extreme rain events and likely greater infiltration of stormwater. As discussed above the discharge rate would be buffered and therefore the inflow rate is not a suitable measure of the discharge rate.

The plant operated with full compliance for effluent water quality relating to BOD<sub>5</sub>, TSS, faecal coliforms (FC), and Enterococci (ENT) (Table 1). Maximum medians of 4.7 mg/L BOD<sub>5</sub> and 16.0 mg/L TSS were well below the 30-mg/L limits, and FC of 75 CFU/100 mL and ENT of 76 MPN/100 mL were excellent compared to 700 CFU/100 mL and 1,750 MPN/100 mL consented.

### **Receiving Environment Monitoring**

The receiving environment was monitored around the outfall and at two control sites (Quail Island and Church Bay) (Attachment 2.2). Human health related parameters of FC and ENT were usually at or below the respective detection limits. Trigger levels of 1 mg/L for TN and 0.91 mg/L for NH<sub>3</sub> were not exceeded at any of the sites with maximum values of 0.3mg/L TN at 50 m due west of the outfall and 0.024 mg/L NH<sub>3</sub> at Church Bay. Monitoring results did not appear to be significantly different between the outfall sites and the control sites.

**Table 1. Summary of Exceedances and Non-Compliances from July 2014-June 2015.**

<b>Parameter</b>	<b>Exceedances of Trigger Value</b>
Flow <2,500 m <sup>3</sup> /d	0
Discharge Flowrate <34 L/s	Unable to confirm compliance
BOD <sub>5</sub> median <30 mg/L	0
TSS median <30 mg/L	0
FC <700 CFU/100 mL	0
ENT <1,750 MPN/100 mL	0
TN <1 mg/L	0
NH <sub>3</sub> <0.91 mg/L	0

**Table 2. Incoming instantaneous flowrates from July 2014-June 2015.**

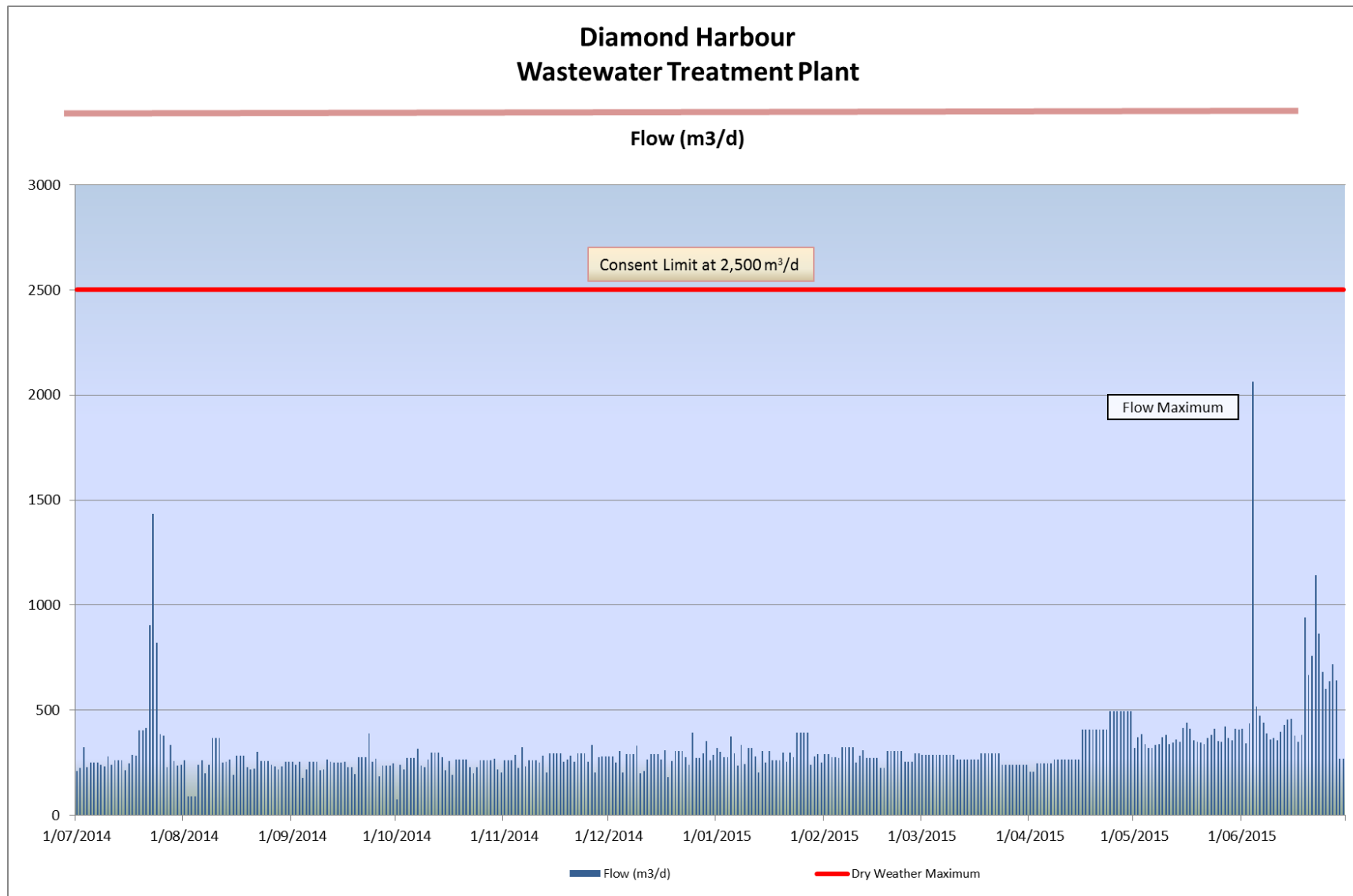
<b>Month</b>	<b>Values &gt; 34 L/s [#]</b>
Jul-14	23
Aug-14	
Sep-14	
Oct-14	
Nov-14	
Dec-14	
Jan-15	3
Feb-15	
Mar-15	8
Apr-15	32
May-15	
Jun-15	671
<b>Total</b>	<b>737</b>

## Attachment 1.1: Flows, Diamond Harbour, Data

Date	Flow [m <sup>3</sup> /d]	Date	Flow [m <sup>3</sup> /d]	Date	Flow [m <sup>3</sup> /d]	Date	Flow [m <sup>3</sup> /d]
1/07/2014	209	1/10/2014	76	1/01/2015	319	1/04/2015	209
2/07/2014	227	2/10/2014	241	2/01/2015	302	2/04/2015	209
3/07/2014	325	3/10/2014	217	3/01/2015	275	3/04/2015	248
4/07/2014	230	4/10/2014	274	4/01/2015	276	4/04/2015	248
5/07/2014	250	5/10/2014	274	5/01/2015	374	5/04/2015	248
6/07/2014	250	6/10/2014	274	6/01/2015	296	6/04/2015	248
7/07/2014	250	7/10/2014	315	7/01/2015	235	7/04/2015	248
8/07/2014	239	8/10/2014	237	8/01/2015	336	8/04/2015	264
9/07/2014	234	9/10/2014	228	9/01/2015	244	9/04/2015	264
10/07/2014	280	10/10/2014	267	10/01/2015	322	10/04/2015	264
11/07/2014	239	11/10/2014	300	11/01/2015	322	11/04/2015	264
12/07/2014	263	12/10/2014	300	12/01/2015	279	12/04/2015	264
13/07/2014	263	13/10/2014	300	13/01/2015	203	13/04/2015	264
14/07/2014	263	14/10/2014	275	14/01/2015	304	14/04/2015	264
15/07/2014	216	15/10/2014	214	15/01/2015	252	15/04/2015	264
16/07/2014	246	16/10/2014	257	16/01/2015	305	16/04/2015	408
17/07/2014	286	17/10/2014	194	17/01/2015	262	17/04/2015	408
18/07/2014	284	18/10/2014	265	18/01/2015	262	18/04/2015	408
19/07/2014	404	19/10/2014	265	19/01/2015	262	19/04/2015	408
20/07/2014	404	20/10/2014	265	20/01/2015	297	20/04/2015	408
21/07/2014	417	21/10/2014	265	21/01/2015	253	21/04/2015	408
22/07/2014	905	22/10/2014	228	22/01/2015	297	22/04/2015	408
23/07/2014	1435	23/10/2014	200	23/01/2015	277	23/04/2015	408
24/07/2014	819	24/10/2014	230	24/01/2015	394	24/04/2015	494
25/07/2014	387	25/10/2014	262	25/01/2015	394	25/04/2015	494
26/07/2014	380	26/10/2014	262	26/01/2015	394	26/04/2015	494
27/07/2014	229	27/10/2014	262	27/01/2015	394	27/04/2015	494
28/07/2014	333	28/10/2014	262	28/01/2015	241	28/04/2015	494
29/07/2014	258	29/10/2014	269	29/01/2015	281	29/04/2015	494
30/07/2014	237	30/10/2014	218	30/01/2015	290	30/04/2015	494
31/07/2014	239	31/10/2014	202	31/01/2015	250	1/05/2015	322
1/08/2014	260	1/11/2014	261	1/02/2015	292	2/05/2015	370
2/08/2014	89	2/11/2014	261	2/02/2015	292	3/05/2015	387
3/08/2014	89	3/11/2014	261	3/02/2015	275	4/05/2015	340
4/08/2014	89	4/11/2014	288	4/02/2015	277	5/05/2015	321
5/08/2014	239	5/11/2014	225	5/02/2015	272	6/05/2015	322
6/08/2014	261	6/11/2014	324	6/02/2015	324	7/05/2015	336
7/08/2014	201	7/11/2014	231	7/02/2015	324	8/05/2015	340
8/08/2014	238	8/11/2014	263	8/02/2015	324	9/05/2015	371
9/08/2014	367	9/11/2014	263	9/02/2015	324	10/05/2015	384
10/08/2014	367	10/11/2014	263	10/02/2015	252	11/05/2015	340
11/08/2014	367	11/11/2014	249	11/02/2015	283	12/05/2015	346
12/08/2014	250	12/11/2014	285	12/02/2015	308	13/05/2015	361
13/08/2014	255	13/11/2014	203	13/02/2015	272	14/05/2015	349
14/08/2014	266	14/11/2014	296	14/02/2015	272	15/05/2015	414
15/08/2014	194	15/11/2014	296	15/02/2015	272	16/05/2015	442
16/08/2014	285	16/11/2014	296	16/02/2015	272	17/05/2015	412
17/08/2014	285	17/11/2014	296	17/02/2015	225	18/05/2015	358
18/08/2014	285	18/11/2014	254	18/02/2015	225	19/05/2015	348
19/08/2014	230	19/11/2014	265	19/02/2015	306	20/05/2015	347
20/08/2014	217	20/11/2014	283	20/02/2015	306	21/05/2015	338
21/08/2014	221	21/11/2014	253	21/02/2015	306	22/05/2015	369
22/08/2014	302	22/11/2014	295	22/02/2015	306	23/05/2015	383
23/08/2014	257	23/11/2014	295	23/02/2015	306	24/05/2015	410
24/08/2014	257	24/11/2014	295	24/02/2015	255	25/05/2015	354
25/08/2014	257	25/11/2014	256	25/02/2015	255	26/05/2015	350
26/08/2014	240	26/11/2014	336	26/02/2015	255	27/05/2015	424
27/08/2014	234	27/11/2014	205	27/02/2015	295	28/05/2015	367
28/08/2014	218	28/11/2014	276	28/02/2015	295	29/05/2015	355
29/08/2014	234	29/11/2014	281	1/03/2015	286	30/05/2015	410
30/08/2014	255	30/11/2014	281	2/03/2015	286	31/05/2015	408
31/08/2014	255	1/12/2014	281	3/03/2015	286	1/06/2015	413
1/09/2014	255	2/12/2014	281	4/03/2015	286	2/06/2015	343
2/09/2014	239	3/12/2014	252	5/03/2015	286	3/06/2015	438
3/09/2014	253	4/12/2014	304	6/03/2015	286	4/06/2015	2064
4/09/2014	178	5/12/2014	204	7/03/2015	286	5/06/2015	518
5/09/2014	219	6/12/2014	291	8/03/2015	286	6/06/2015	472
6/09/2014	255	7/12/2014	291	9/03/2015	286	7/06/2015	442
7/09/2014	255	8/12/2014	291	10/03/2015	286	8/06/2015	390
8/09/2014	255	9/12/2014	330	11/03/2015	265	9/06/2015	359
9/09/2014	213	10/12/2014	198	12/03/2015	265	10/06/2015	368
10/09/2014	217	11/12/2014	212	13/03/2015	265	11/06/2015	357
11/09/2014	264	12/12/2014	264	14/03/2015	265	12/06/2015	396
12/09/2014	256	13/12/2014	292	15/03/2015	265	13/06/2015	429
13/09/2014	252	14/12/2014	292	16/03/2015	265	14/06/2015	455
14/09/2014	252	15/12/2014	292	17/03/2015	265	15/06/2015	459
15/09/2014	252	16/12/2014	265	18/03/2015	295	16/06/2015	380
16/09/2014	255	17/12/2014	308	19/03/2015	295	17/06/2015	351
17/09/2014	229	18/12/2014	180	20/03/2015	295	18/06/2015	384
18/09/2014	229	19/12/2014	259	21/03/2015	295	19/06/2015	940
19/09/2014	197	20/12/2014	306	22/03/2015	295	20/06/2015	668
20/09/2014	277	21/12/2014	306	23/03/2015	295	21/06/2015	757
21/09/2014	277	22/12/2014	306	24/03/2015	241	22/06/2015	1142
22/09/2014	277	23/12/2014	275	25/03/2015	241	23/06/2015	863
23/09/2014	388	24/12/2014	240	26/03/2015	241	24/06/2015	682
24/09/2014	253	25/12/2014	395	27/03/2015	241	25/06/2015	603
25/09/2014	269	26/12/2014	271	28/03/2015	241	26/06/2015	637
26/09/2014	184	27/12/2014	271	29/03/2015	241	27/06/2015	720
27/09/2014	236	28/12/2014	294	30/03/2015	241	28/06/2015	642
28/09/2014	236	29/12/2014	352	31/03/2015	241	29/06/2015	582
29/09/2014	236	30/12/2014	261			30/06/2015	555
30/09/2014	247	31/12/2014	288				

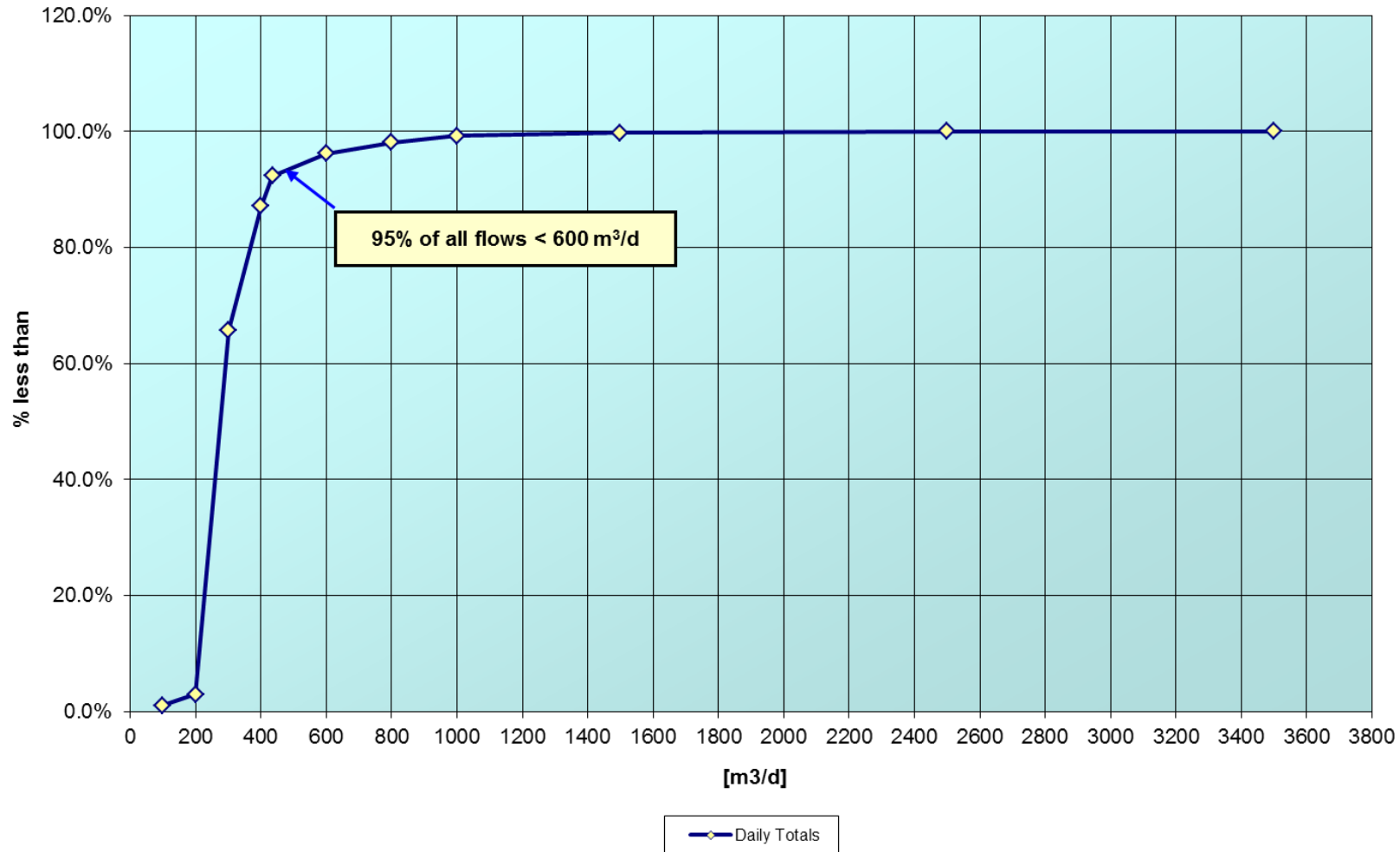


**Attachment 1.2: Flows, Diamond Harbour, Chart**



**Attachment 1.3: Flows, Diamond Harbour, '% less than'**

**Diamond Harbour WWTP flows < x m<sup>3</sup>/d**





**Attachment 2.1: Lab Data, Diamond Harbour Wastewater Treatment Plant**

Plant:		Diamond Harbour Wastewater Treatment, Banks Peninsula											
Asset Owner:		Christchurch City Council											
Laboratory		Christchurch City Council Laboratory, City Water & Waste Unit											
									5-Sample Median				
Date	BOD <sub>5</sub>	DRP	TSS	TN	NH <sub>4</sub> -N	NOx	FC	ENT	BOD <sub>5</sub>	TSS	FC	ENT	
	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	CFU/100ml	MPN/100ml	[mg/l]	[mg/l]	CFU/100ml	MPN/100ml	
16/07/2014	18.0	2.0	40	31.2	23	0.24	5900	4600	3.3	6.5	5.0	5	
20/08/2014	1.1	0.48	4.0	4.3	1.6	1.4	10	10	3.3	6.5	5.0	5	
10/09/2014	2.7	0.91	19	2.5	0.69	0.32	1	10	3.3	8.0	5.0	5	
15/10/2014	2.4	2.7	9.0	3.3	2.7	0.15	10	10	3.3	9.0	5.0	5	
9/12/2014	9.0	1.2	7	4.3	2.8	1.1	10	10	2.6	8.0	10.0	10	
19/12/2014	12.0		27.0				410	290	3.2	9.3	10.0	10	
23/12/2014	4.8		17				23000	24000	4.2	9.3	10.0	10	
30/12/2014	4.5		16				140	52	4.7	12.8	75.0	31	
7/01/2015	1.5	1	3	3.7	2	0.93	10	10	4.7	11.5	75.0	31	
13/01/2015	1.9		7				10	100	4.7	11.5	75.0	76	
21/01/2015	3.6		16				10	10	4.1	16.0	75.0	76	
28/01/2015	2.5		4				10	10	3.1	11.5	10.0	31	
3/02/2015	4.3		10				10	10	3.1	8.5	10.0	10	
10/02/2015	3.4	2.7	36	5.6	1	0.99	20	10	3.0	8.5	10.0	10	
19/02/2015	5.0		9				10	10	3.5	9.5	10.0	10	
25/02/2015	3.6		5				20	250	3.6	9.5	10.0	10	
11/03/2015	2.9	3.5	3	4.6	1.8	0.99	60	20	3.5	7.0	15.0	10	
16/04/2015	1.4	0.18	5	3.5	0.28	2.0	10	10	3.5	7.0	15.0	10	
7/05/2015	2.6	1.9	3	3.2	1.3	1.9	10	10	3.2	5.0	15.0	10	
11/06/2015	1.0	1.4	6	6.3	0.35	4.6	10	10	2.8	5.0	10.0	10	
								<b>Limit</b>	30	30	700	1750	
								<b>Exceedances</b>	0	0	0	0	
	<b>As</b>	<b>Cd</b>	<b>Cr</b>	<b>Cu</b>	<b>Pb</b>	<b>Ni</b>	<b>Zn</b>						
	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]						
6/01/2011	0.0015	0.0002	0.001	0.0020	0.0025	0.0021	0.0250						

Removed < for calculations and halved the value.

## Attachment 2.2: Lab Data, Receiving Environment

	OF - 50m due East	OF 50m due North	OF - 50m due South	OF - 50m due West	Church Bay	OF - 50m due East	OF 50m due North	OF - 50m due South	OF - 50m due West	Church Bay	OF - 50m due East	OF 50m due North	OF - 50m due South	OF - 50m due West	Church Bay	OF - 50m due East	OF 50m due North	OF - 50m due South	OF - 50m due West	Church Bay	
	TN	TN	TN	TN	TN	NH3	NH3	NH3	NH3	NH3	NOX	NOX	NOX	NOX	NOX	DRP	DRP	DRP	DRP	DRP	
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
19/11/2014	0.28	0.26	0.27	0.28	0.29	0.011	0.016	0.017	0.011	0.009	0.01	0.01	0.01	0.01	0.01	0.011	0.0052	0.0094	0.013	0.013	
9/12/2014	0.20	0.2	0.16	0.19	0.21	0.005	0.005	0.005	0.005	0.005	0.01	0.01	0.01	0.01	0.01	0.0078	0.0068	0.0088	0.0067	0.0077	
7/01/2015	0.22	0.22	0.23	0.26	0.28	0.005	0.005	0.005	0.006	0.005	0.01	0.01	0.01	0.011	0.01	0.0086	0.02	0.0084	0.012	0.014	
11/02/2015	0.15	0.13	0.16	0.15	0.15	0.005	0.005	0.005	0.005	0.012	0.01	0.01	0.01	0.01	0.01	0.014	0.024	0.014	0.011	0.011	
11/03/2015	0.16	0.14	0.15	0.16	0.15	0.019	0.014	0.017	0.007	0.005	0.011	0.01	0.01	0.01	0.01	0.017	0.014	0.016	0.015	0.018	
7/05/2015	0.12	0.13	0.21	0.30	0.10	0.005	0.005	0.012	0.013	0.024	0.022	0.023	0.019	0.021	0.018	0.014	0.012	0.013	0.012	0.011	
16/06/2015	0.15	0.16	0.15	0.13	0.14	0.005	0.005	0.005	0.005	0.005	0.049	0.049	0.051	0.05	0.049	0.024	0.014	0.024	0.024	0.023	
average	0.23	0.18	0.19	0.21	0.188	0.008	0.008	0.009	0.007	0.009	0.017	0.017	0.017	0.017	0.017	0.014	0.014	0.013	0.013	0.014	
maximum	0.28	0.26	0.27	0.30	0.290	0.019	0.016	0.017	0.013	0.024	0.049	0.049	0.051	0.050	0.049	0.024	0.024	0.024	0.024	0.023	

	OF - 50m due East	OF 50m due North	OF - 50m due South	OF - 50m due West	Church Bay	OF - 50m due East	OF 50m due North	OF - 50m due South	OF - 50m due West	Church Bay	OF - 50m due East	OF 50m due North	OF - 50m due South	OF - 50m due West	Church Bay	OF - 50m due East	OF 50m due North	OF - 50m due South	OF - 50m due West	Church Bay
	TSS	TSS	TSS	TSS	TSS	Chla	Chla	Chla	Chla	Chla	ENT	ENT	ENT	ENT	ENT	FC	FC	FC	FC	FC
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	MPN/100mL	MPN/100mL	MPN/100mL	MPN/100mL	MPN/100mL	CFU/100mL	CFU/100mL	CFU/100mL	CFU/100mL	CFU/100mL
19/11/2014	53	50	46	48	47	2.7	2.6	2.4	2.3	2.1	10	10	10	10	10	1.0	1.0	1.0	2	1
9/12/2014	44	53	38	30	38	0.1	0.1	0.09	0.12	0.1	10	10	10	10	10	1.0	3	3	5	2.0
7/01/2015	67	67	85	79	46	3.4	3	2.9	3	3.6	10	10	10	10	10	3	1.0	1	1	1.0
11/02/2015	18	20	20	31	47	3.9	3.2	3.9	3.2	3.8	10	10	10	10	10	1	1.0	1.0	1.0	10.0
11/03/2015	24	23	38	20	34	3.7	3.8	3.8	5	4.9	10	30	10	10	10	1.0	1.0	1.0	1	1.0
7/05/2015	35	34	35	38	30	4.3	5.8	4.8	6.7	3.7	10	10	10	10	10	1.0	1.0	1	1.0	1.0
16/06/2015	41	33	35	40	54	1.1	0.6	0.6	0.6	0.8	10	10	10	10	10	1	1.0	2	2	2
average	40	40	42	41	42	2.74	2.7	2.641	2.989	2.714	10.000	12.857	10.000	10.000	10.000	2	1.286	1.429	1.857	2.571
maximum	67	67	85	79	54	4.3	5.8	4.8	6.7	4.9	10	30	10	10	10	3	3	3	5	10

Removed < for calculations and halved the value.