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Christchurch Wastewater Treatment Plant

Annual Monitoring Report

July 2013 - June 2014

CHRISTCHURCH WASTEWATER TREATMENT PLANT • SHUTTLE DRIVE OFF PAGES ROAD

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File: CRC051724 Annual Report For Ocean Outfall 2013-2014.DOC

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Summary

This report summarises the results of parameters monitored by the Christchurch Wastewater Treatment Plant (CWTP) over the period July 2013 – June 2014 in accordance with consent CRC051724. Consent CRC051724 allows the discharge of treated wastewater from the CWTP Oxidation Ponds into the Pegasus Bay Coastal Marine Area via an ocean outfall.

Of the comprehensive sampling programme required by the consents, all samples were collected during the monitoring period and most monitored parameters achieved the required standards. CWTP's replacement outlet structure from the plant to Pond 1 is operational, but will not be fully completed until October 2014.

There were exceedances in the e. coli levels of tuatua sampled just after the storm event and reported to CWTP 01/07/13. ECan was notified, and Citycare was instructed to erect signs warning against shellfish harvesting on the same day. Additional samples by EOS Ecology were received 26/07/13, and showed bacterial levels to be back within consent. There was another exceedance in June 2014 and we are still undergoing repeat sampling as of this report. Exceedances were traced to network overflows.

A 1 in 100 year storm occurred on the 4th and 5th of March. This resulted in a very high flow into the plant, and a number of citywide overflows. Overflows for the Northern and Southern toe drains were recorded and combined with Citycare's overflow reports sent to ECan. This was followed by another storm of lesser intensity in mid-April, causing problems for the plant and wider network.

Christchurch Wastewater Treatment Plant Contents

Annual Monitoring Report

Jul 2013 – Jun 2014

1 Outfall Discharge

1.1 Resource Consent Conditions

Table 1.1.1 Pond Discharge Consent Compliance for Monitoring Period July 2013 – June 2014 CRC051724

Consent Condition	Parameter	Compliance Condition	Compliance												
			Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Overall
2	Discharge Content	Discharge is only wastewater from the CWTP ponds	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺
3	Discharge Volume	Recorded	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺
4	Discharge Rate	Recorded	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺
9	Outfall Maintenance	Routine maintenance completed and recorded	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺
10	Outfall Condition	Visual inspection of outfall	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	☺
12	Pumping Pressure for a given flow	Monitored	☺	☺	☺	☺	☺	😐	☺	☺	☺	☺	☺	☺	☺

Key: ☺ Full Compliance 😐 Minor, Isolated or Risk of Non-Compliance ☹ Major or Consistent Non-Compliance

1.2 Comments on Resource Consent Conditions

The Ocean Outfall Pumping Station has operated within expected parameters and is comparable with last year's performance. The discharge flows and pressures were recorded as noted in the quarterly reports.

Figure 1.2.1 - Daily Outfall Flow Totals Jul 2013 – Jun 2014

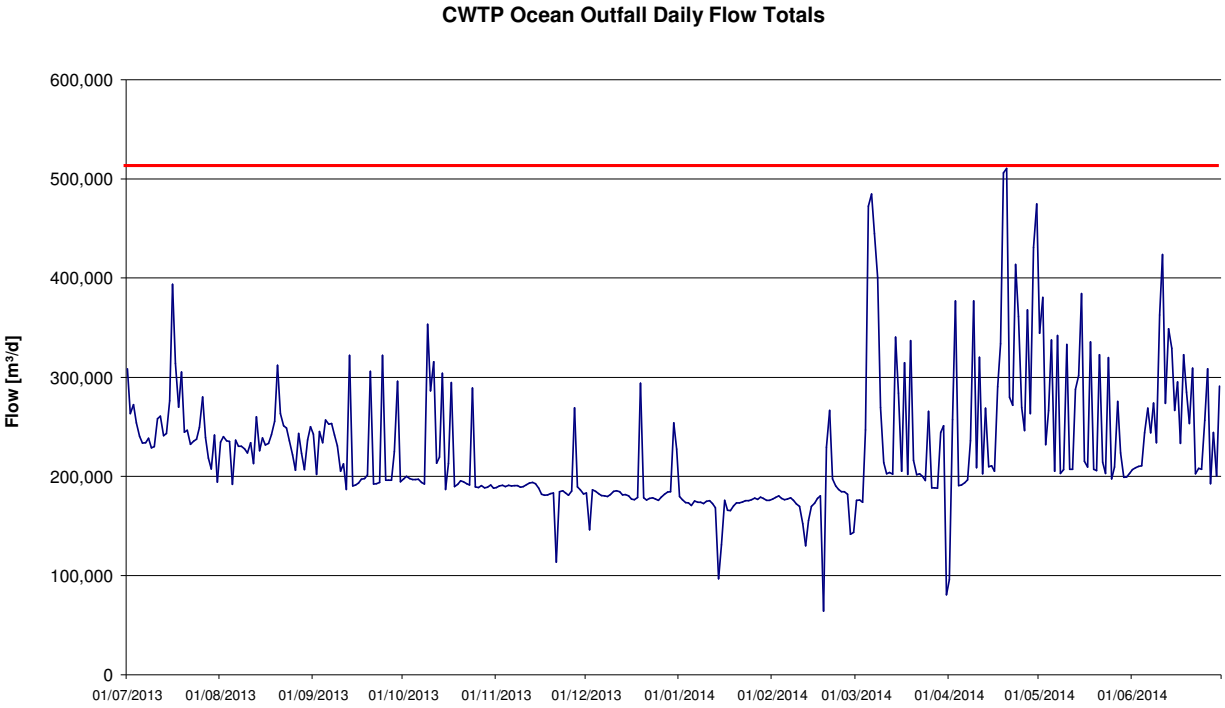
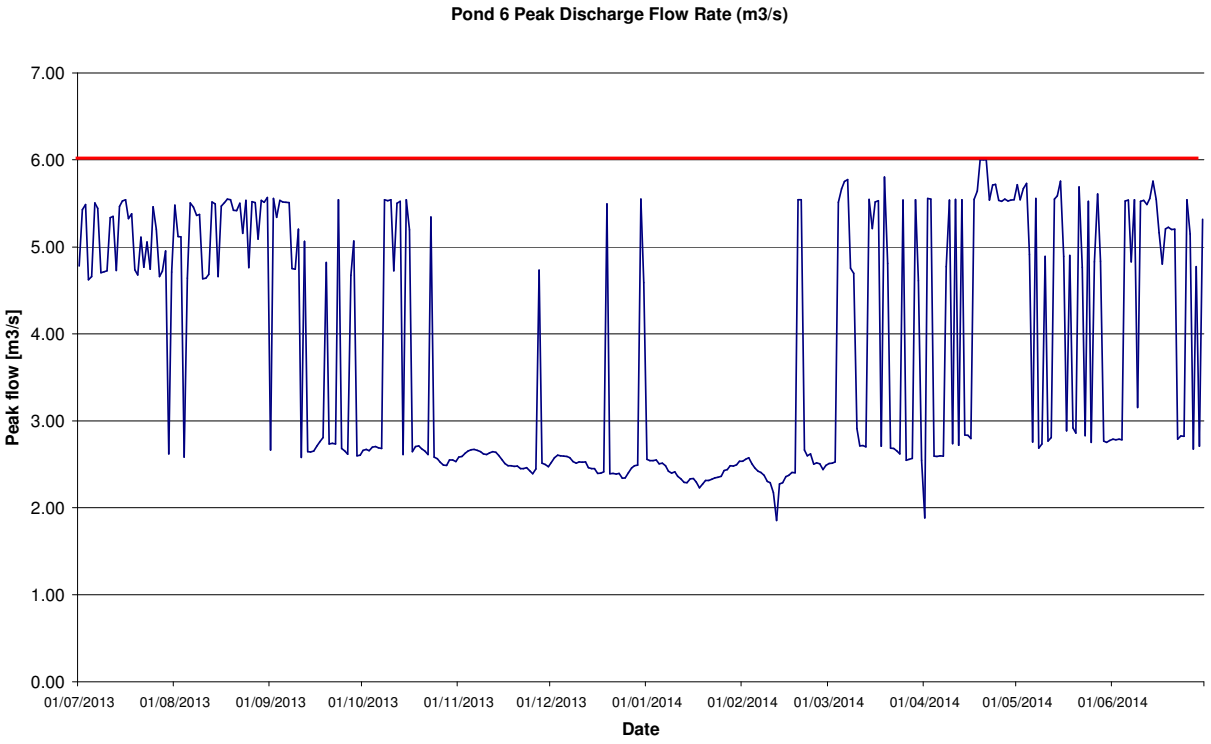


Figure 1.2.2 - Daily Peak Outfall Flows Jul 2013 - Jun 2014



1.3 Resource Consent Standard Conditions

Table 1.3.1 Contaminant Limits Consent Compliance Jul 2013 – Jun 2014 CRC051724

Consent Condition	Parameter	Compliance Condition	Compliance												
			Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Overall
15a	Dissolved BOD_5	Concentration does not exceed 20 g/m^3	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺
	Total Suspended Solids	Concentration does not exceed 50 g/m^3	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺
	Ammoniacal Nitrogen	Concentration does not exceed 40 g/m^3	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺
16a	Faecal Coliforms	Concentration does not exceed 1,000(standard)/5,000(higher) MPN/100mL	☺	☺	☺	☺	☺	☺	☺	☺	😐	😐	☺	☺	😐
	Enterococci	Concentration does not exceed 1,500 MPN/100mL	☺	☺	☺	☺	☺	☺	☺	☺	😐	☺	☺	☺	😐

Key: ☺ Compliance Achieved with no Exceedance of Standard 😐 Compliance Achieved with Occasional Exceedance of Standard ☹ Exceedance of Standard resulting in Non-Compliance

1.4 Comments on Resource Consent Standard Conditions

Most samples were collected, although there was an error in laboratory scheduling that resulted in a three week gap between 19/09 – 10/10 for phosphorous, nitrite/nitrates and TKN (should be done fornightly). High rainfall events resulted in an exceedance of the higher faecal coliform limit during March and an exceedance of the standard limit in April 2014. There were corresponding exceedances of the enterococci limits in March and April.

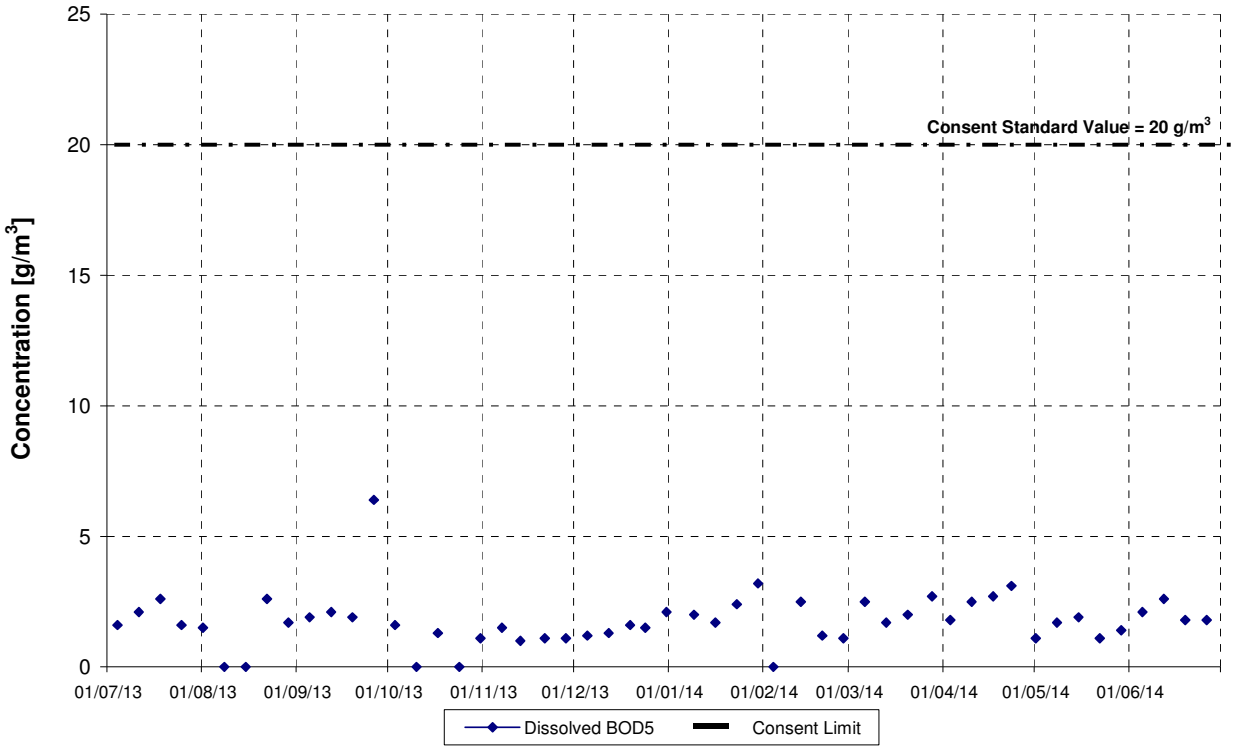
1.5 Dissolved BOD_5 Compliance

Table 1.5.1 Pond Discharge Dissolved BOD_5

Median Value [g/m^3] Current Monitoring Period (July 2013 - June 2014)	1.8	Number of Exceedances Current Monitoring Period (July 2013 - June 2014)	0
Median Value [g/m^3] Previous Monitoring Period (July 2012 - June 2013)	2.0	Number of Exceedances Previous Monitoring Period (July 2012 - June 2013)	1

There were no values exceeding the $20g/m^3$ limit recorded for the current year. The mean value for the current reporting period were similar to the previous period

1.5.2 Pond Discharge Dissolved BOD_5



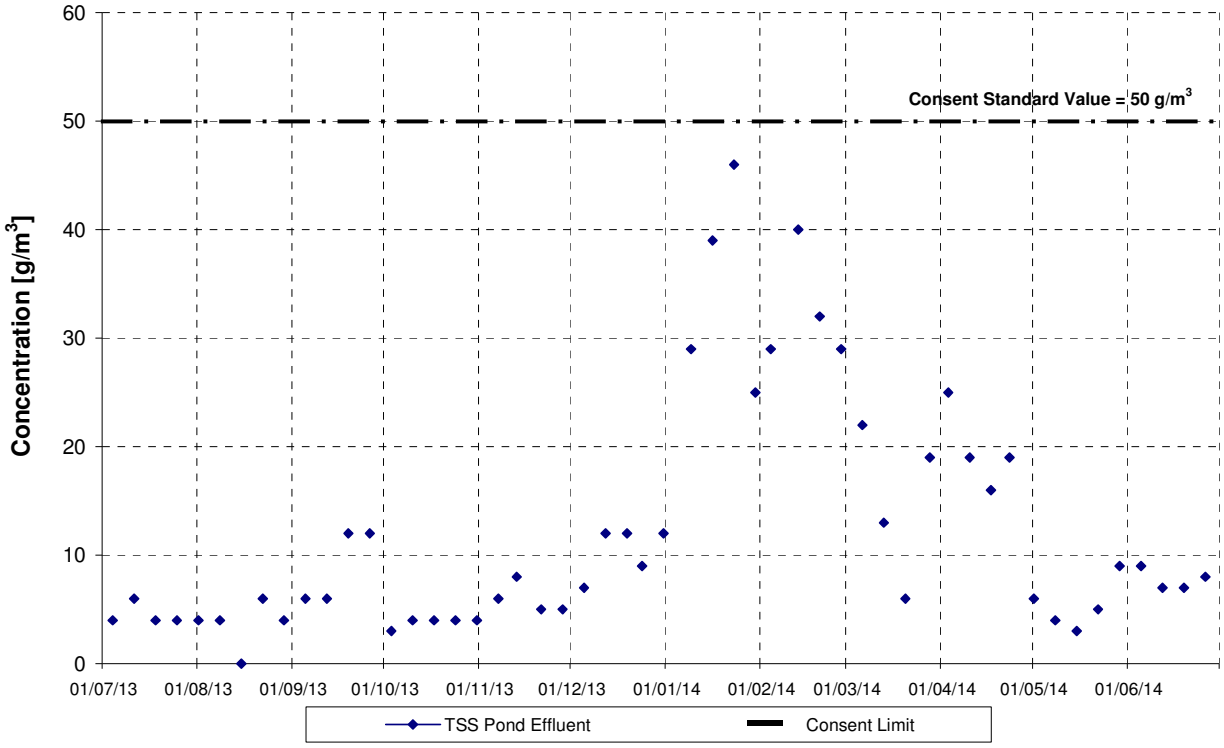
1.6 Total Suspended Solids Compliance

Table 1.6.1 Pond Discharge Total Suspended Solids

Median Value [g/m^3] Current Monitoring Period (July 2013 - June 2014)	7	Number of Exceedances Current Monitoring Period (July 2013 - June 2014)	0
Median Value [g/m^3] Previous Monitoring Period (July 2012 - June 2013)	16	Number of Exceedances Previous Monitoring Period (July 2012 - June 2013)	3

There were no exceedances recorded for the current year. The median value for the current period was lower than the previous reporting period.

1.6.2 Pond Discharge Total Suspended Solids



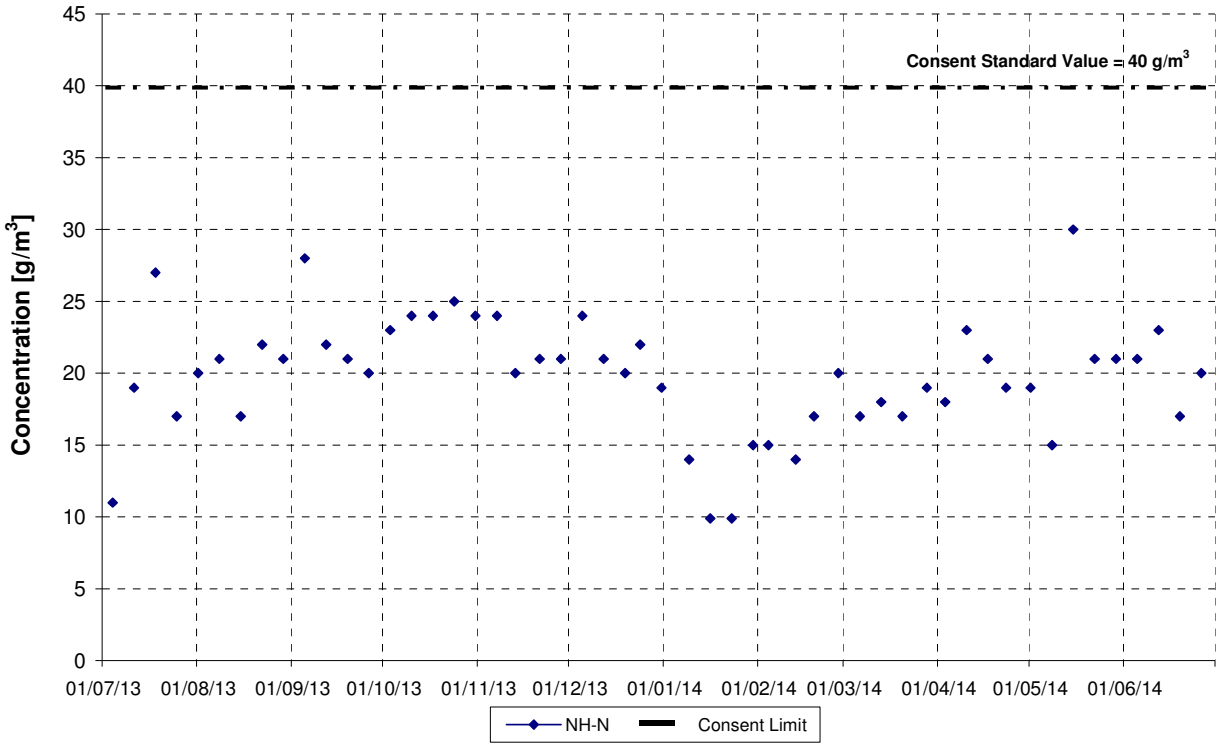
1.7 Ammonia Nitrogen Compliance

Table 1.7.1 Pond Discharge Ammoniacal Nitrogen

Median Value [g/m^3] Current Monitoring Period (July 2013 - June 2014)	20	Number of Exceedances Current Monitoring Period (July 2013 - June 2014)	0
Median Value [g/m^3] Previous Monitoring Period (July 2012 - June 2013)	21	Number of Exceedances Previous Monitoring Period (July 2012 - June 2013)	0

There were no exceedances recorded for current year. The mean value for the current period were similar to the previous reporting period.

1.7.1 Pond Discharge Ammoniacal Nitrogen



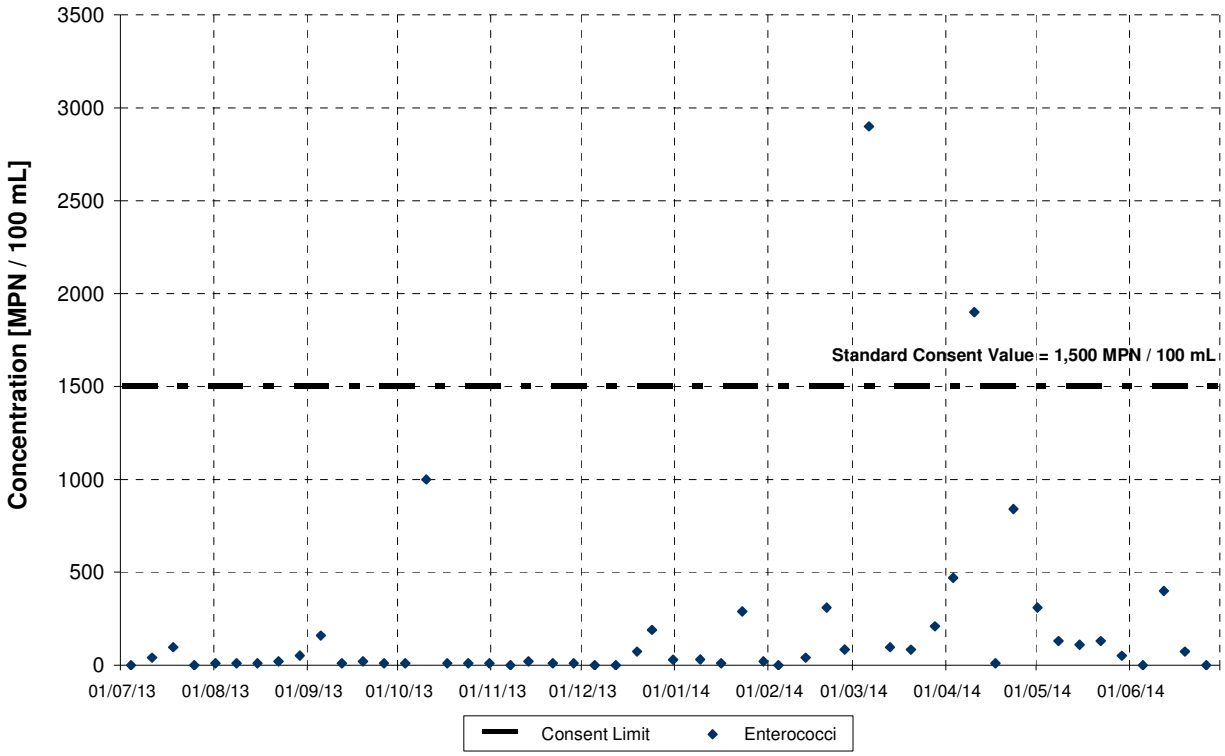
1.8 *Enterococci Monitoring*

Table 1.8.1 Pond Discharge Enterococci

Median Value [MPN/100ml] Current Monitoring Period (July 2013 - June 2014)	90	Number of Exceedances Current Monitoring Period (July 2013 - June 2014)	2
Median Value [MPN/100ml] Previous Monitoring Period (July 2012 - June 2013)	60	Number of Exceedances Previous Monitoring Period (July 2012 - June 2013)	1

There were two exceedances of the consented value in the current year due to high rainfall events in March and April. The mean value was higher than the previous period.

1.8.1 Pond Discharge Enterococci



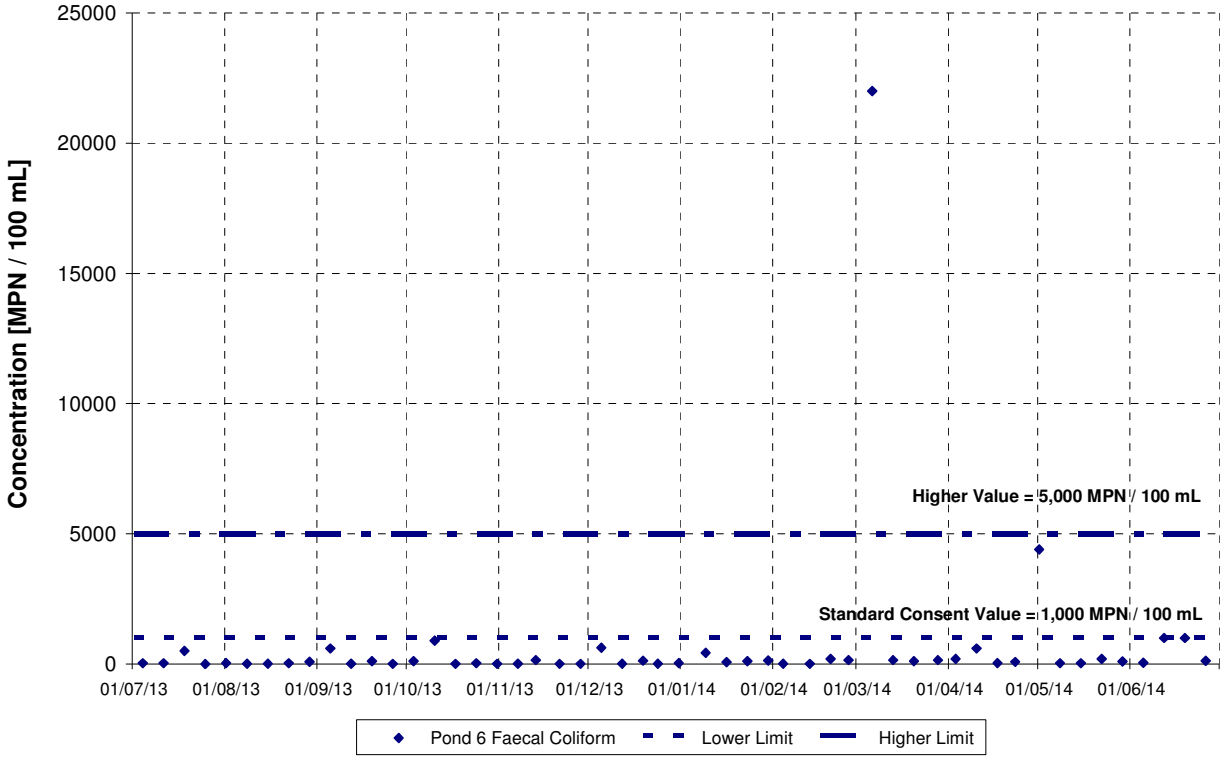
1.9 *Faecal Coliform Compliance*

Table 1.9.1 Pond Discharge Faecal Coliforms

Median Value [MPN/100ml] Current Monitoring Period (July 2013 - June 2014)	90	Number of Exceedances of Lower Limit Current Monitoring Period (July 2013 - June 2014)	2
Median Value [MPN/100ml] Previous Monitoring Period (July 2012 - June 2013)	105	Number of Exceedances of Lower Limit Previous Monitoring Period (July 2012 - June 2013)	5

There were two non-compliance samples due to high rainfall events in March and April 2014. The median for this year is lower than the previous period.

1.9.1 Pond Discharge Faecal Coliforms



1.10 Other Pathogenic, and Other Contaminants

Condition 13e

Giardia cysts, cryptosporidium, salmonella, enterovirus, adenovirus and campylobacter levels have been measured and reported in March 2014.

Condition 13f

Heavy metals (copper, chromium, nickel, zinc, cadmium, lead, arsenic, and mercury) were measured and reported July 2013, January 2014 and June 2014.

Condition 13g

Organochlorine pesticides, organophosphate pesticides, PCBs, and polycyclic aromatic hydrocarbons were measured and reported February 2014.

Condition 17

No scums, foams or other floatable material was observed at the edge of the diffuser mixing zone during the March 2014 survey.

2 Receiving Environment Monitoring in Pegasus Bay

2.1 *Water Quality Resource Consent Conditions*

Table 2.1.1 Receiving Environment Water Quality Consent Compliance July 2013 – August 2014

Consent Condition	Parameter	Compliance Condition	Compliance				
			Jul - Oct 13	Nov –Jan 14	Feb – Apr 14	May - Jun 14	Overall
18	Faecal Coliforms	Sampled and Analysed	☺	😐	☺	☺	😐
	Enterococci	Sampled and Analysed	☺	☺	☺	☺	☺
22a[1]	Temperature	Two yearly	n/a	n/a	n/a	n/a	n/a
	DO	Two yearly	n/a	n/a	n/a	n/a	n/a
	Salinity	Two yearly	n/a	n/a	n/a	n/a	n/a
	Total Suspended Solids	Two yearly	n/a	n/a	n/a	n/a	n/a
	Nitrogen Oxides	Two yearly	n/a	n/a	n/a	n/a	n/a
	Ammoniacal Nitrogen	Two yearly	n/a	n/a	n/a	n/a	n/a
	Dissolved Reactive Phosphorus	Two yearly	n/a	n/a	n/a	n/a	n/a
	Chlorophyll-a	Two yearly	n/a	n/a	n/a	n/a	n/a
	Trace Metals (arsenic, cadmium, copper, chromium, lead, nickel and zinc)	Two yearly	n/a	n/a	n/a	n/a	n/a
	Faecal Coliforms	Two yearly	n/a	n/a	n/a	n/a	n/a
	Enterococci	Two yearly	n/a	n/a	n/a	n/a	n/a
	Phytoplankton Species	Two yearly	n/a	n/a	n/a	n/a	n/a

Key: ☺ Full Compliance 😐 Minor, Isolated or Risk of Non-Compliance ☹ Major or Consistent Non-Compliance

[1] Sampling is scheduled for 2013.

2.2 *Comments on Compliance*

Most results for the Pegasus Bay area were within consent for August – October 2013. An error in sample collection resulted in no samples being taken for the first week of August.

A 24 hour repeat sample by the laboratory sampling team for the high faecal results 21/01/14 was not taken – however the following routine sample was well within the limits.

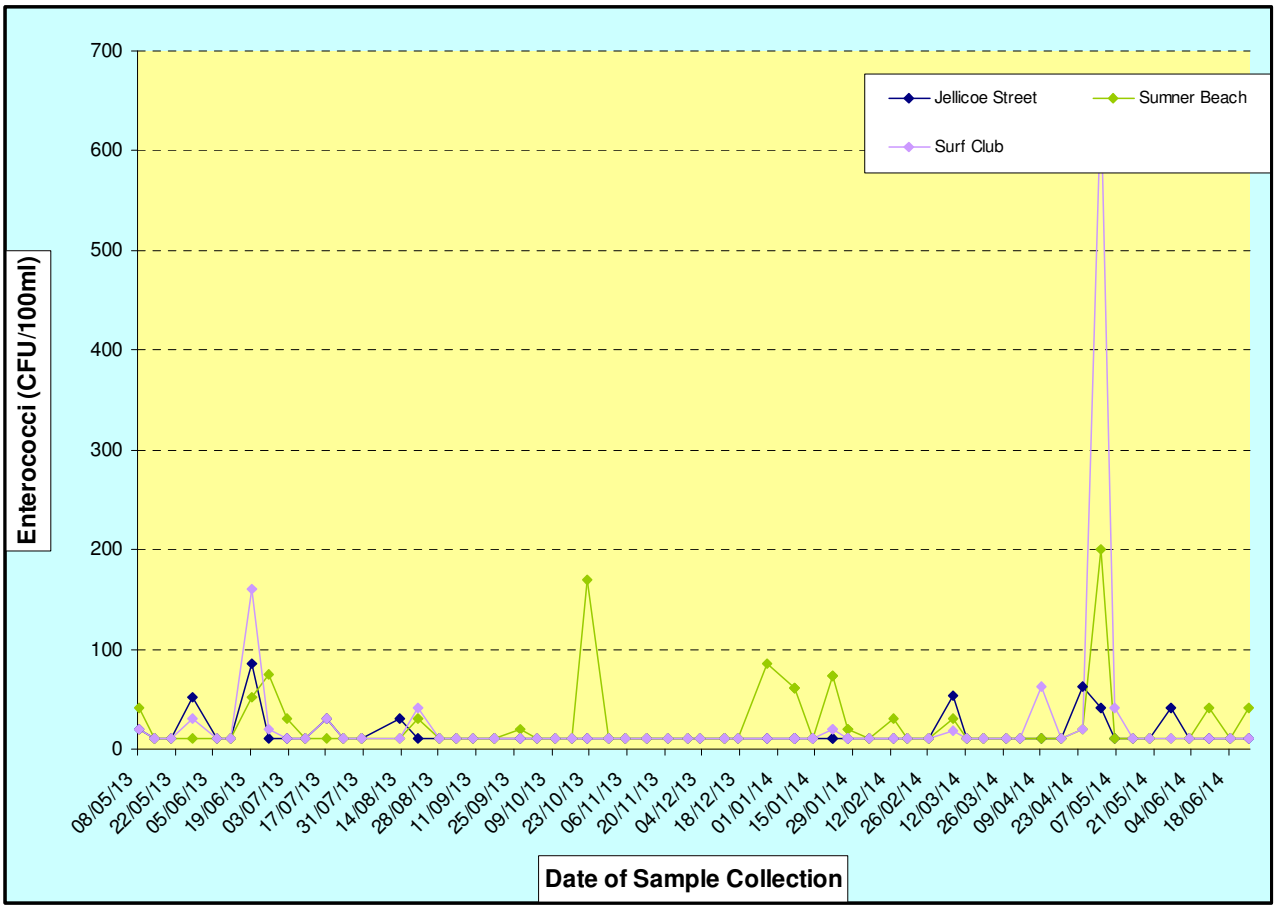
2.3 *Beach Water Quality Analysis Results*

Samples for condition 18 were taken at weekly intervals from the prescribed onshore locations. The results are presented in Figures 2.3.1and 2.3.2. Retest results are contained in the appendices.

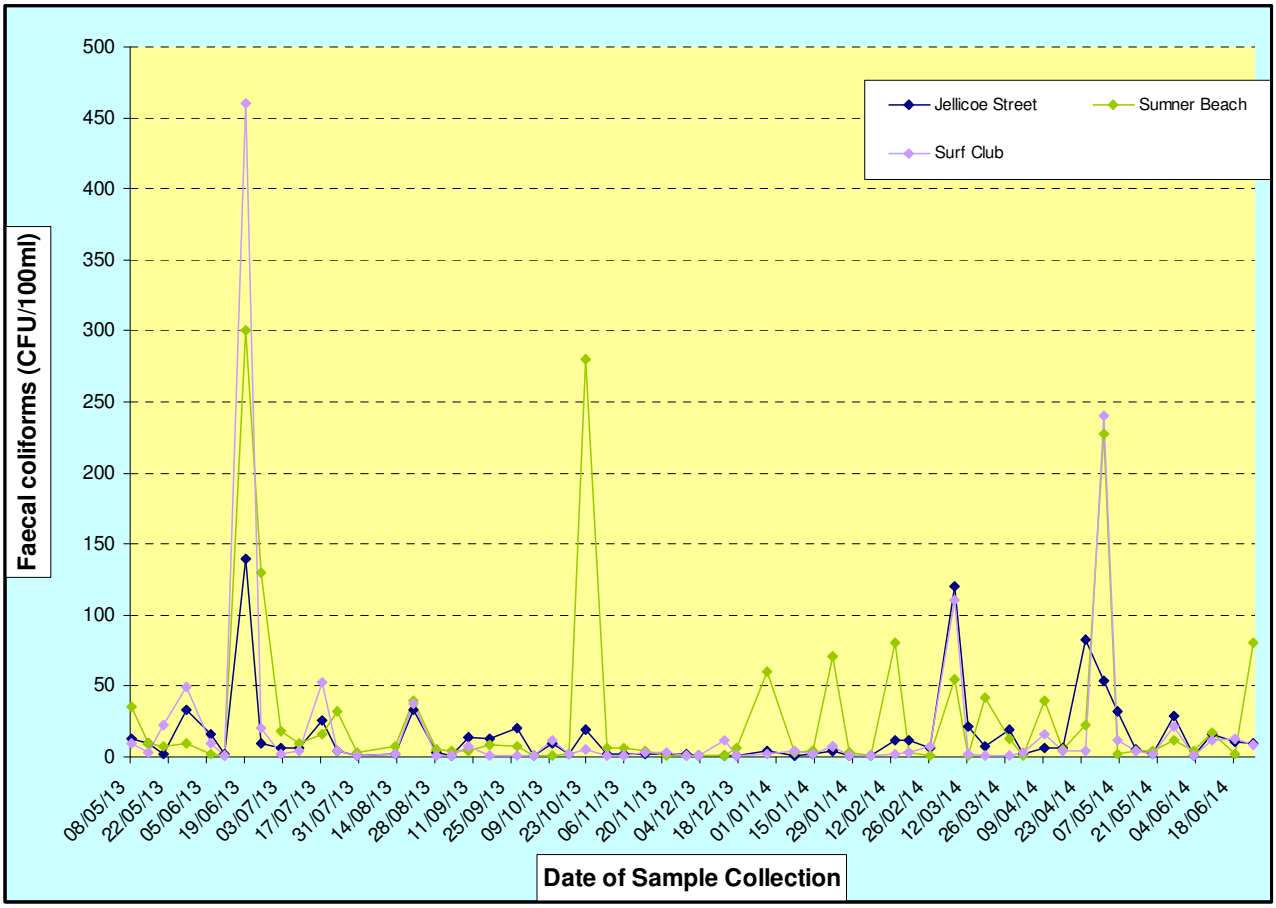
High initial results in August 2012 were due to a high rainfall event, although retests were within the limits.

The high rainfall event in June 2013 resulted in high repeat samples for all three beaches. ECan and the Canterbury Medical Officer of Health was informed 24/06 of high enterococci and f. coliform on all three beach sites. Samples taken 25/06 showed that bacterial levels had dropped within consent limits. The high samples were due to pumping station overflows.

2.3.1 Enterococci Levels at beaches adjacent to the Outfall



2.3.2 Faecal Coliform Levels at beaches adjacent to the Outfall



2.4 Other Receiving Environment Analysis

Consent conditions 23, 25, 26 and 27 call for monitoring of the marine environment around the outfall at various frequencies and were identified in the AEE. These requirements are summarised in Table 2.4.1. The results are attached to the quarterly reports covering the same period.

Table 2.4.1 Receiving Environment Monitoring Consent Compliance Jul 2013 - Jun 2014

Consent Condition	Parameter	Frequency	Compliance Condition	Compliance				
				Jul - Oct 13	Nov –Jan 14	Feb – Apr 14	May - Jun 14	Overall
23	Marine Sediments	5-yearly	Reported	n/a	n/a	n/a	n/a	n/a
25	Benthic Invertebrates	5-yearly	Reported	n/a	n/a	n/a	n/a	n/a
26	Epibenthic Fauna	5-yearly	Reported	n/a	n/a	n/a	n/a	n/a
27	Shellfish/Tuatua	Quarterly	Sampled and Analysed	☺	😐	☺	😐	😐
29	Complaints	As required	Recorded and Reported	☺	☺	☺	☺	☺
31	Report	Annually	Report and information lodged with ECan	☺	n/a	n/a	n/a	☺
32	Report	Quarterly	Report and information lodged with ECan	☺	☺	☺	☺	☺
34	Management Plan	4 Years post commissioning	Report and information lodged with ECan	n/a	n/a	n/a	n/a	n/a

Key: ☺ Full Compliance 😐 Minor, Isolated or Risk of Non-Compliance ☹ Major or Consistent Non-Compliance

2.5 Comments on Other Receiving Environment

Conditions 23 - 26

Sediment, benthic and epibenthic testing is due in 2016.

Condition 27

Shellfish were sampled and analysed. A single exceedance of the tuatua e.coli limit occurred at the Sumner Surf club in April 2013. ECan was advised immediately and signs, warning members of the public to avoid shellfish collection, were placed around the sampling area. A follow-up sample was taken by EOS Ecology a week later showed e.coli readings were below the 2.3 MPN/ml limit. Signs on the beach were subsequently removed. Records did not show any sewer overflows that could have caused the exceedance, but it is possible the contamination source was a stormwater outlet located near The Esplanade (Sumner). All other samples did not exceed the 2.3 MPN/ml e.coli limit.

Shellfish were sampled just after the heavy and prolonged rainfall event in June 2013 and the high bacterial results reported to CWTP 01/07. ECan was notified, and Citycare to instructed to erect signs warning against shellfish harvesting on the same day. Resamples done by EOS Ecology were received 26/07, and showed bacterial levels to be back within consent. The higher shellfish bacterial count was due to the network overflows that occurred during the heavy rainfall event in June.

A meeting with members of the Community Liaison Group was held Wednesday 2nd October.

Shellfish at the Rockinghorse Rd site had to be resampled twice in Dec 2013 due to high e.coli levels. Signs were erected until levels dropped below consent requirements.

There has been an exceedance of the e. coli limit for Tuatua near the Sumner Surf Club during the June 2014 round of testing as a result of high rainfall received mid June. As of this report, the area is still under repeat testing and actions have been taken as per the consent.

Condition 29

There were no complaints from the public regarding the ocean outfall during the reporting period.

Condition 31 and 32

Annual and quarterly reports have been submitted to ECan.

Condition 33

A report on the diffuser field testing is not due until 2016.

Condition 34

The validation of the AEE management plan has been completed, and was emailed to ECan 30/06/14.