



**CHRISTCHURCH**

CITY COUNCIL • YOUR PEOPLE • YOUR CITY

# **Christchurch Wastewater Treatment Plant**

## **Quarterly Monitoring Report**

**May 2013 – July 2013**

CHRISTCHURCH WASTEWATER TREATMENT PLANT • SHUTTLE DRIVE OFF PAGES ROAD  
PO BOX 73041 • CHRISTCHURCH • NEW ZEALAND • TEL 64-3-941-5701 • FAX 64-3-941-5729

File: Monitoring Report May - Jul 2013.doc

Contact: Lee Liaw

# Summary

This report summarises the results of parameters monitored by the Christchurch Wastewater Treatment Plant (CWTP) over the period May 2013 to July 2013 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 consent, all the samples were collected during the monitoring period and most monitored parameters achieved the required standards.

The storm event that occurred 17/06 – 22/06 caused a range of consent exceedances.

- Faecal coliform count for ocean outfall intake
- Tuatua samples
- Beach samples

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.

Shellfish were sampled just after the storm event and 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.

A project is underway to replace earthquake damaged pond structures by building a new influent structure in Pond 1; this is expected to be completed by late 2013.

# Christchurch Wastewater Treatment Plant Contents

## Quarterly Monitoring Report

May 2013 to July 2013

<b>SUMMARY .....</b>	<b>2</b>
<b>1   OUTFALL DISCHARGE .....</b>	<b>4</b>
1.1 <i>Resource Consent Conditions .....</i>	4
1.2 <i>Comments on Compliance .....</i>	4
1.3 <i>Resource Consent Standard Conditions .....</i>	6
1.4 <i>Comments on Compliance.....</i>	6
1.5 <i>Dissolved BOD<sub>5</sub> Compliance .....</i>	7
1.6 <i>Total Suspended Solids Compliance .....</i>	8
1.7 <i>Ammonia Nitrogen Compliance.....</i>	9
1.8 <i>Enterococci Monitoring .....</i>	10
1.9 <i>Faecal Coliform Compliance .....</i>	11
<b>2   RECEIVING ENVIRONMENT MONITORING IN PEGASUS BAY .....</b>	<b>12</b>
2.1 <i>Water Quality Resource Consent Conditions .....</i>	12
2.2 <i>Comments on Compliance.....</i>	12
2.3 <i>Beach Water Quality Analysis Results.....</i>	13
2.4 <i>Other Receiving Environment Analysis.....</i>	15
2.5 <i>Comments on Compliance.....</i>	15

# 1 Outfall Discharge

## 1.1 Resource Consent Conditions

Consent CRC051724 allows CWTP to discharge up to 518,000 cubic metres per day of treated wastewater from the CWTP Oxidation Ponds at a maximum rate of six cubic metres per second into the Pegasus Bay coastal marine area. Compliance conditions regarding the physical discharge to the estuary are summarised in Table 1.1.1. Daily records of maximum outfall discharge flow rates and volumes are attached as an appendix to this report, and shown in summary in Figures 1.2.1 and 1.2.2.

**Table 1.1.1** Pond Discharge Consent Compliance for Monitoring Period May 2013 – Jul 2013 CRC051724

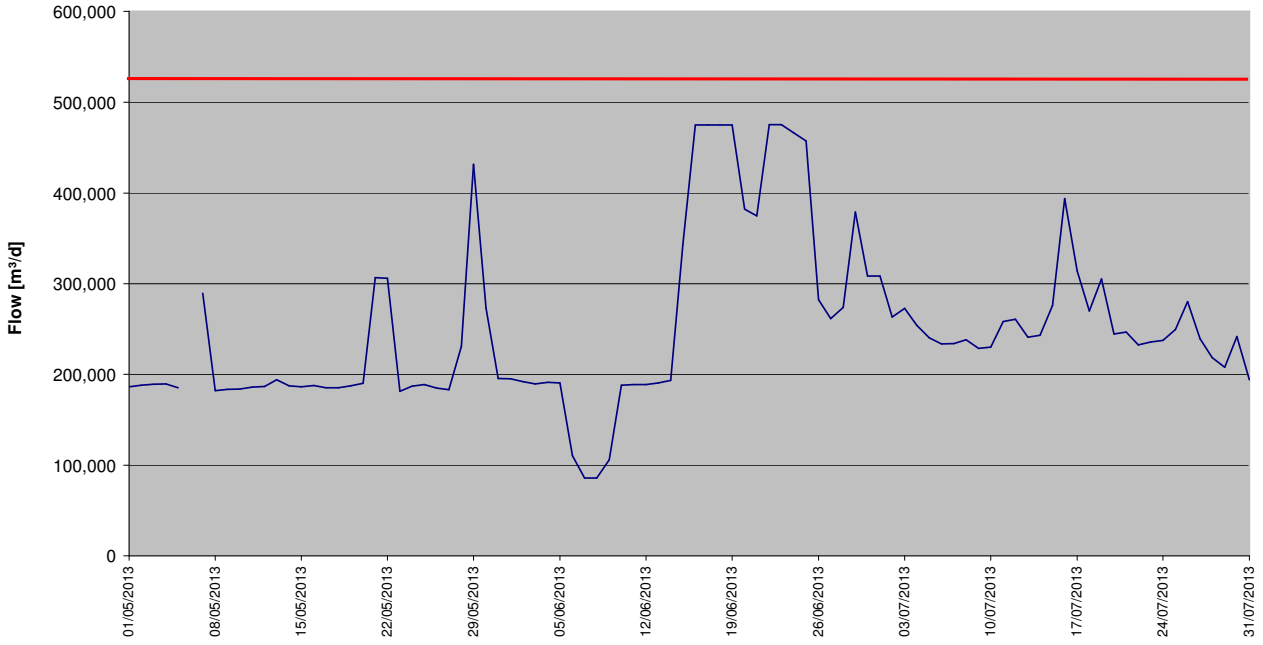
Consent Condition	Parameter	Compliance Condition	Compliance			
			May 13	Jun 13	Jul 13	Overall
2	Discharge Content	Discharge is only wastewater from the CWTP ponds	☺	☺	☺	☺
3	Discharge Volume	Recorded	☹	☺	☺	☹
4	Discharge Rate	Recorded	☹	☺	☺	☹
9	Outfall Maintenance	Routine maintenance completed and recorded	☺	☺	☺	☺
10	Outfall Condition	Visual inspection of outfall	n/a	n/a	n/a	n/a
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 Compliance

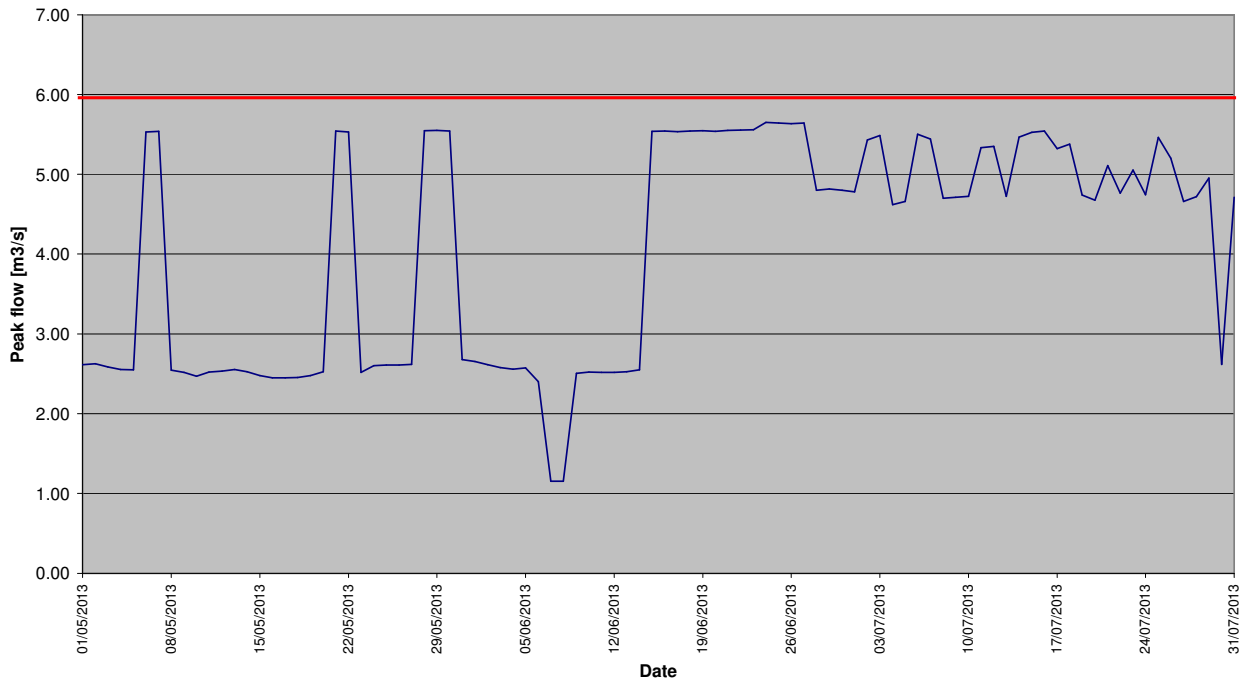
Flowrate and pressure data were recorded as per consent requirements. An issue with the radio network 06/05/13 resulted in the loss of flow and pressure data.

**CWTP Ocean Outfall Daily Flow Totals**



**Figure 1.2.1 - Daily Outfall Flow Totals**

**Pond 6 Peak Discharge Flow Rate (m3/s)**



**Figure 1.2.2 - Daily Peak Outfall Flows**

### 1.3 Resource Consent Standard Conditions

Conditions 15 and 16 of consent CRC051724 set out concentration standards for a selection of parameters monitored in compliance with condition 13. No more than 16 samples in each rolling 26 week period should exceed the standard value for contaminants listed under condition 15a, and if more than seven from eight consecutive samples should exceed the standard value ECan must be notified within 48 hours. No more than six from eight consecutive samples should exceed the standard value for contaminants listed under condition 16a, and no more than two from eight consecutive samples should exceed the higher value. If more than seven from eight exceed the standard value, or three from eight exceed the higher value, ECan must be notified within 48 hours. Compliance conditions regarding adherence to these standard values are summarised in Table 1.3.1. Analysis results are supplied to Environment Canterbury at quarterly intervals. Contaminant monitoring results for consent CRC051724 are discussed further in Sections 1.4 – 1.9.

**Table 1.3.1** Contaminant Limits Consent Compliance May– Jul 2013 CRC051724

Consent Condition	Parameter	Compliance Condition	Compliance			
			May 13	Jun 13	Jul 13	Overall
15a	Dissolved BOD <sub>5</sub>	Concentration does not exceed 20 g/m <sup>3</sup>	☺	☺	☺	☺
	Total Suspended Solids	Concentration does not exceed 50 g/m <sup>3</sup>	☺	☺	☺	☺
	Ammoniacal Nitrogen	Concentration does not exceed 40 g/m <sup>3</sup>	☺	☺	☺	☺
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 Compliance

There were a single exceedance of the higher faecal coliform limit, and another of the standard limit in June. Both exceedances were due to the prolonged heavy rainfall event in June.

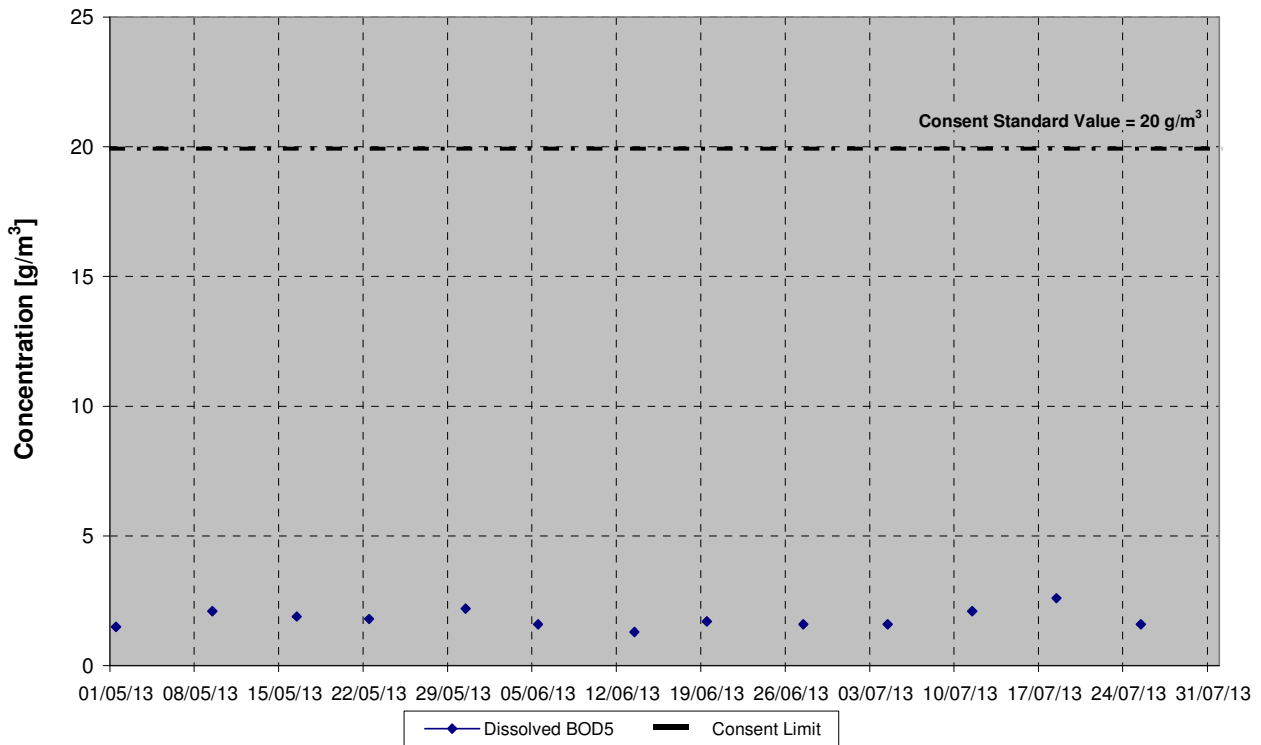
### 1.5 Dissolved BOD<sub>5</sub> Compliance

The median dissolved BOD<sub>5</sub> concentration for the period May – July 2013 was 1.7g/m<sup>3</sup>. This is lower than the median concentrations in the previous quarter and lower than the same quarter in 2012. There were no exceedances of the standard value (20 g/m<sup>3</sup>) in the current monitoring quarter.

**Table 1.5.1** Pond Discharge Dissolved BOD<sub>5</sub>

Median Value [g/m <sup>3</sup> ] Current Monitoring Quarter (May 2013 – Jul 2013)	1.7	Number of Exceedances Current Monitoring Quarter (May 2013 – Jul 2013)	0
Median Value [g/m <sup>3</sup> ] Previous Monitoring Quarter (Feb 2013 – Apr 2013)	2.5	Number of Exceedances Previous Monitoring Quarter (Feb 2013 – Apr 2013)	1
Median Value [g/m <sup>3</sup> ] Same Monitoring Quarter of Previous Year (May 2012 – Jul 2012)	2.2	Number of Exceedances Same Monitoring Quarter of Previous Year (May 2012 – Jul 2012)	0

**1.5.2** Pond Discharge Dissolved BOD<sub>5</sub>



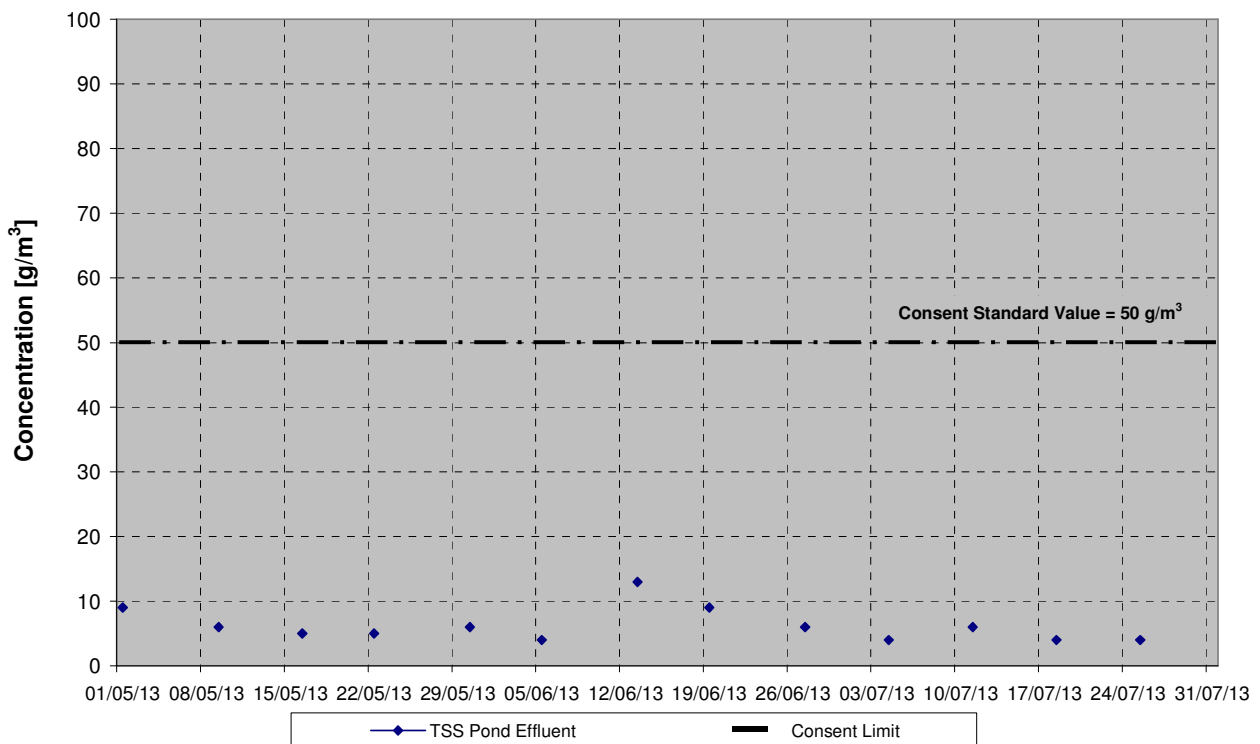
## 1.6 Total Suspended Solids Compliance

The median total suspended solids concentration for the period May – July 2013 was 6g/m<sup>3</sup>. This is lower than both the previous quarter and the same quarter in 2012. There were no exceedances of the standard value (50 g/m<sup>3</sup>).

**Table 1.6.1** Pond Discharge Total Suspended Solids

Median Value [g/m <sup>3</sup> ] Current Monitoring Quarter (May 2013 – Jul 2013)	6	Number of Exceedances Current Monitoring Quarter (May 2013 – Jul 2013)	0
Median Value [g/m <sup>3</sup> ] Previous Monitoring Quarter (Feb 2013 – Apr 2013)	36	Number of Exceedances Previous Monitoring Quarter (Feb 2013 – Apr 2013)	1
Median Value [g/m <sup>3</sup> ] Same Monitoring Quarter of Previous Year (May 2012 – Jul 2012)	12	Number of Exceedances Same Monitoring Quarter of Previous Year (May 2012 – Jul 2012)	0

**1.6.2** Pond Discharge Total Suspended Solids





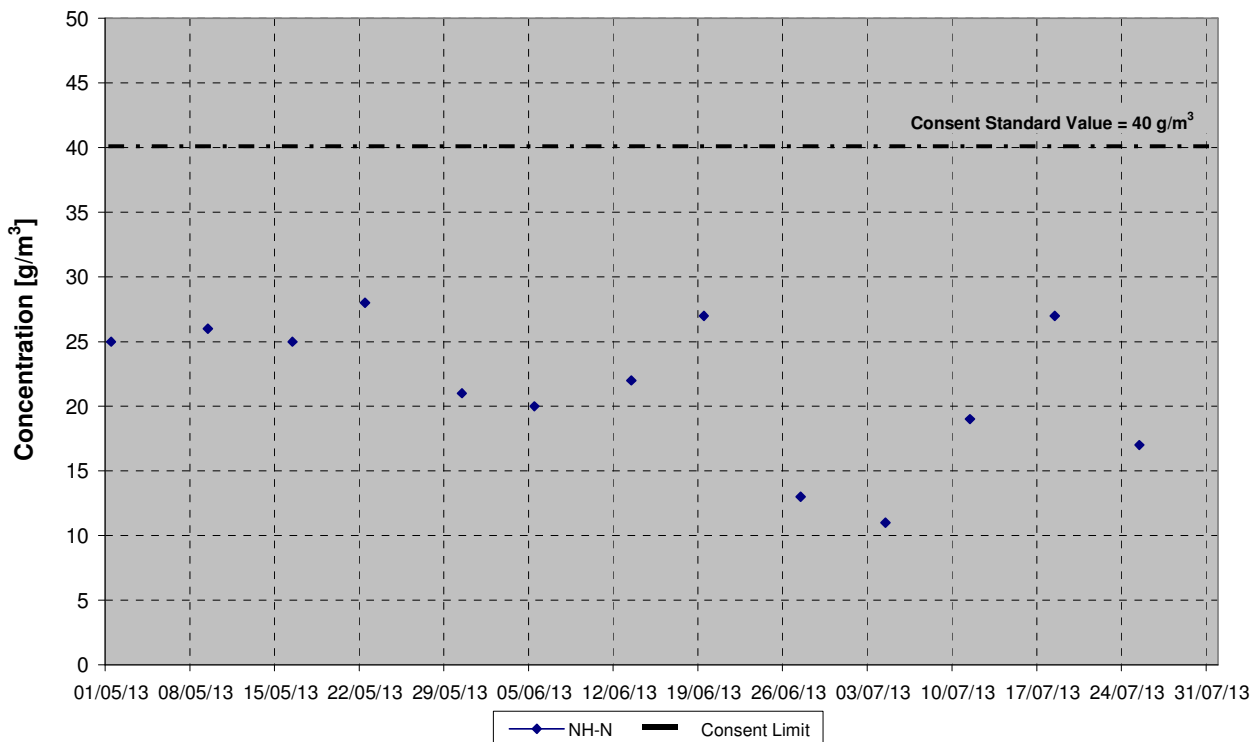
## 1.7 Ammonia Nitrogen Compliance

The median total ammonia nitrogen concentration for the period May – July 2013 was 22 g/m<sup>3</sup>. This was marginally lower than both the previous quarter and same quarter in last year. There were no exceedances of the 40 g/m<sup>3</sup> limit.

**Table 1.7.1** Pond Discharge Ammoniacal Nitrogen

Median Value [g/m <sup>3</sup> ] Current Monitoring Quarter (May 2013 – Jul 2013)	22	Number of Exceedances Current Monitoring Quarter (May 2013 – Jul 2013)	0
Median Value [g/m <sup>3</sup> ] Previous Monitoring Quarter (Feb 2013 – Apr 2013)	23	Number of Exceedances Previous Monitoring Quarter (Feb 2013 – Apr 2013)	0
Median Value [g/m <sup>3</sup> ] Same Monitoring Quarter of Previous Year (May 2012 – Jul 2012)	24	Number of Exceedances Same Monitoring Quarter of Previous Year (May 2012 – Jul 2012)	0

**1.7.1** Pond Discharge Ammoniacal Nitrogen



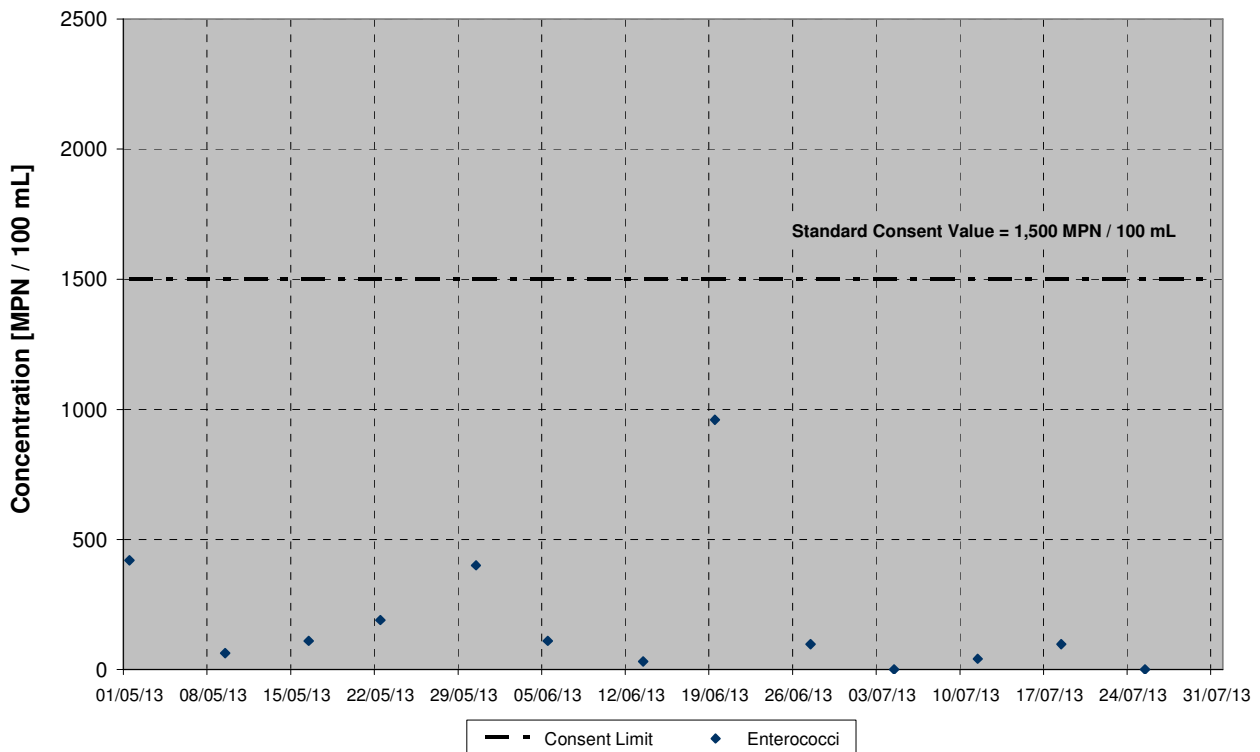
## 1.8 Enterococci Monitoring

The median enterococci concentration in the May – July 2013 reporting period was 110 MPN/100mL. This was higher than previous quarter and the same quarter in 2012. There were no exceedances of the 1,500 MPN/100ml limit during the reporting quarter.

**Table 1.8.1** Pond Discharge Enterococci

Median Value [g/m <sup>3</sup> ] Current Monitoring Quarter (May 2013 – Jul 2013)	110	Number of Exceedances Current Monitoring Quarter (May 2013 – Jul 2013)	0
Median Value [g/m <sup>3</sup> ] Previous Monitoring Quarter (Feb 2013 – Apr 2013)	104	Number of Exceedances Previous Monitoring Quarter (Feb 2013 – Apr 2013)	0
Median Value [g/m <sup>3</sup> ] Same Monitoring Quarter of Previous Year (May 2012 – Jul 2012)	51	Number of Exceedances Same Monitoring Quarter of Previous Year (May 2012 – Jul 2012)	0

**1.8.1** Pond Discharge Enterococci



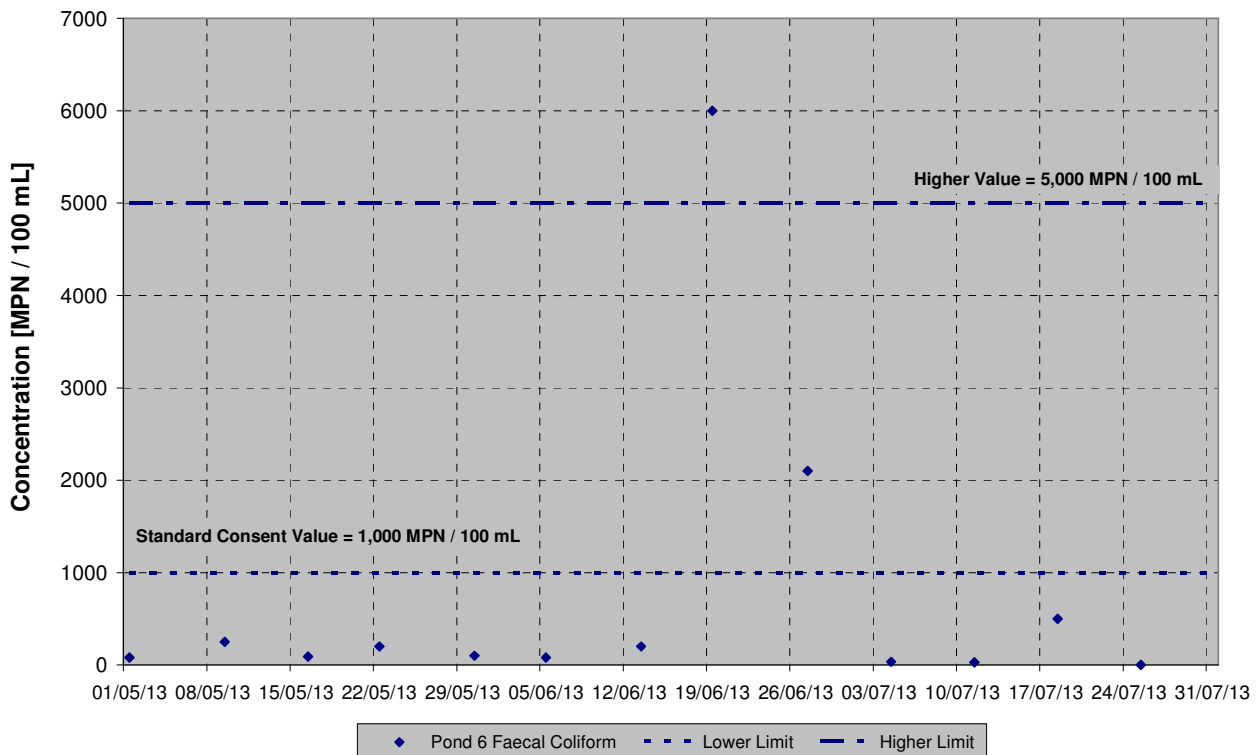
## 1.9 Faecal Coliform Compliance

The median concentration for the reporting period was 150 MPN/100 mL, which is lower than the median for the previous quarter, and lower than the same quarter in 2012. There was a single exceedance of the higher value and another exceedance of the standard value.

**Table 1.9.1** Pond Discharge Faecal Coliforms

Median Value [g/m <sup>3</sup> ] Current Monitoring Quarter (May 2013 – Jul 2013)	150	Number of Exceedances Current Monitoring Quarter (May 2013 – Jul 2013)	2
Median Value [g/m <sup>3</sup> ] Previous Monitoring Quarter (Feb 2013 – Apr 2013)	185	Number of Exceedances Previous Monitoring Quarter (Feb 2013 – Apr 2013)	0
Median Value [g/m <sup>3</sup> ] Same Monitoring Quarter of Previous Year (May 2012 – Jul 2012)	305	Number of Exceedances Same Monitoring Quarter of Previous Year (May 2012 – Jul 2012)	3

### 1.9.1 Pond Discharge Faecal Coliforms



## 2 Receiving Environment Monitoring in Pegasus Bay

### 2.1 Water Quality Resource Consent Conditions

All samples were collected and analysed as required by consent condition 18. Samples for condition 18 are collected from South New Brighton Beach at Jellicoe Street, Sumner Beach at the surf club, and New Brighton at the Surf Club.

Table 2.1.1 Receiving Environment Water Quality Consent Compliance May 2013 – Jul 2013

Consent Condition	Parameter	Compliance Condition	Compliance
			May 13 – Jul 13
18	Faecal Coliforms	Sampled and Analysed	☺
	Enterococci	Sampled and Analysed	☺
22a	Temperature	2 yearly – done this quarter	n/a
	DO	2 yearly – done this quarter	n/a
	Salinity	2 yearly – done this quarter	n/a
	Total Suspended Solids	2 yearly – done this quarter	n/a
	Nitrogen Oxides	2 yearly – done this quarter	n/a
	Ammoniacal Nitrogen	2 yearly – done this quarter	n/a
	Dissolved Reactive Phosphorus	2 yearly – done this quarter	n/a
	Chlorophyll-a	2 yearly – done this quarter	n/a
	Trace Metals (arsenic, cadmium, copper, chromium, lead, nickel and zinc)	2 yearly – done this quarter	n/a
	Faecal Coliforms	2 yearly – done this quarter	n/a
Enterococci	2 yearly – done this quarter	n/a	
Phytoplankton Species	2 yearly – done this quarter	n/a	

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

### 2.2 Comments on Compliance

All results for the Pegasus Bay area were within consent for May – July 2013.

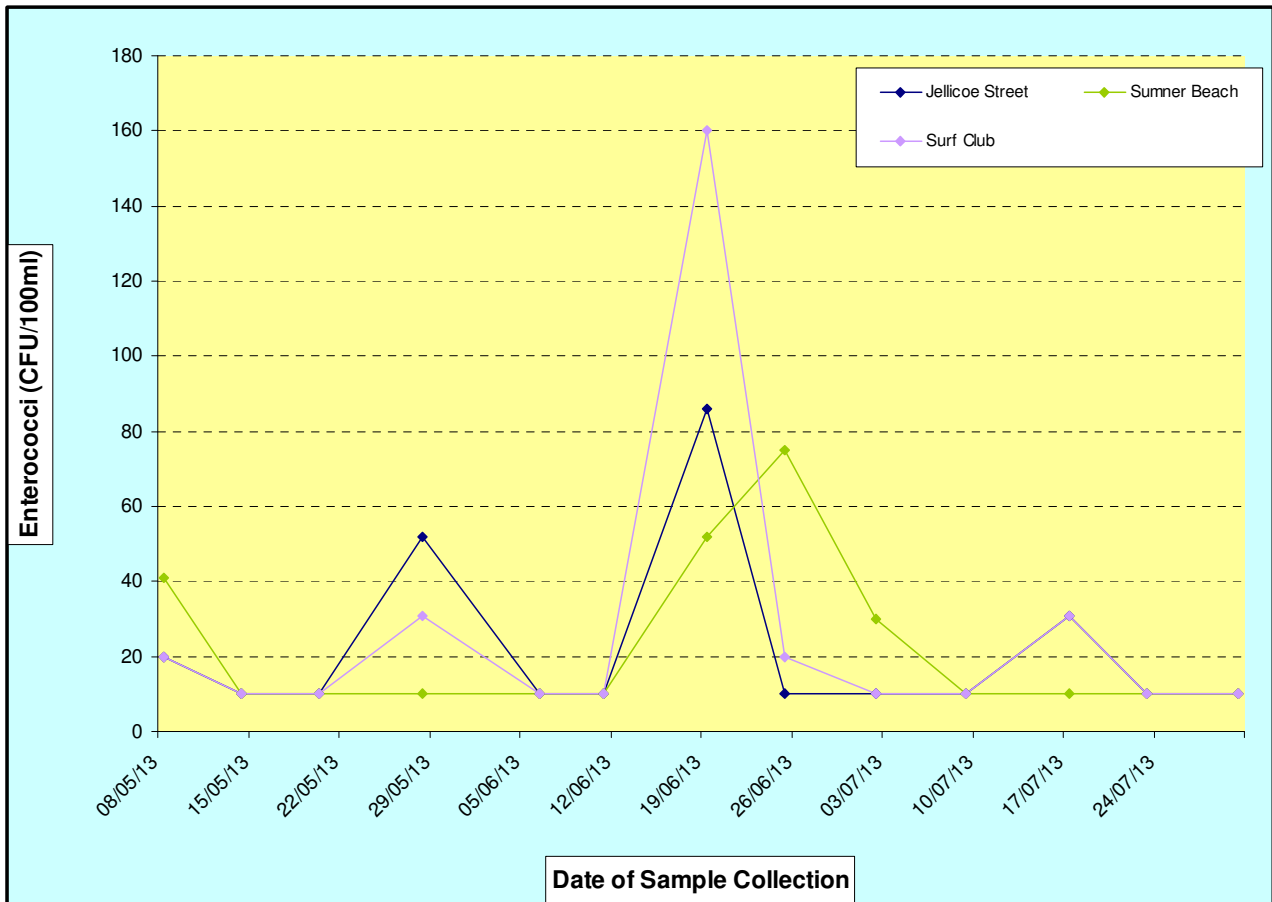
The Feb – Apr quarterly consent report contained a report showing the presence of Pseudo nitzschia algae in the ocean water samples taken around the diffuser mixing zone. At the request of Environment Canterbury, CWTP took several algae population surveys (10/06/13) around the outfall diffuser, at a nearby on-shore location, and at the outfall pump station inlet. All repeat samples had low or negligible levels of P. nitzschia algae. Results were emailed to ECan 26/06/13.

The high rainfall event in June 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 readings. Samples taken 25/06 showed that bacterial levels had dropped within consent limits. The high samples were due overloading of the pumping network.

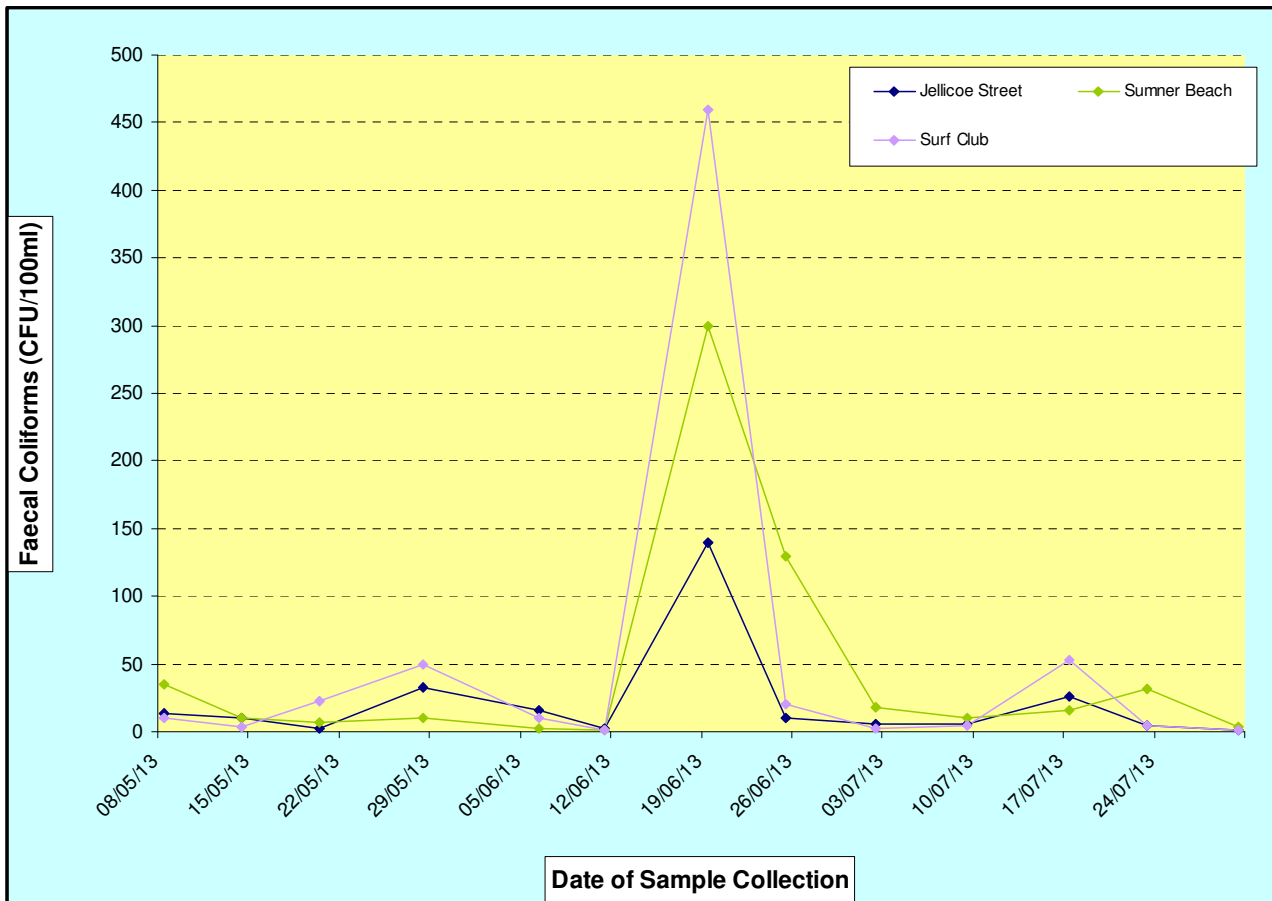
### Beach Water Quality Analysis Results

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

#### 2.2.1 Enterococci Levels at beaches adjacent to the Outfall



### 2.2.2 Faecal Coliform Levels at beaches adjacent to the Outfall



### 2.3 Other Receiving Environment Analysis

Consent conditions 23, 25, 26 and 27 call for monitoring of the marine environment around the outfall at various frequencies, some of which fall in the May – July 2013 monitoring period. These requirements are summarised in Table 2.4.1, and the results are attached as an appendix to this report. Sampling for Conditions 23 – 26 are due 2017.

**Table 2.3.1** Receiving Environment Monitoring Consent Compliance May 2013 – Jul 2013

Consent Condition	Parameter	Frequency	Compliance Condition	Compliance
				May 13 – Jul 13
23	Marine Sediments	5-yearly	Not monitored This Quarter	—
25	Benthic Invertebrates	5-yearly	Not monitored This Quarter	—
26	Epibenthic Fauna	5-yearly	Not monitored This Quarter	—
27	Shellfish	Quarterly	Sampled and Analysed	☹
29	Complaints	As required	Recorded and Reported	☺
31	Report	Quarterly and Annually	Report and information lodged with ECan	☺

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

### 2.4 Comments on Compliance

Repairs to the pond transfer structures under Cuthbert’s Road are underway and is expected to continue until late 2013. There may be some temporary reduction in plant performance, but CWTP will be working with the project managers to mitigate any impact on the Consent.

Shellfish were sampled and analysed. CWTP was informed (01/07/13) that the June samples exceeded the e. coli limit for the beaches at the Sumner Surf club, New Brighton and Jellicoe Street. ECan was advised immediately and signs, warning members of the public to avoid shellfish collection, were placed around the sampling area. Follow-up samples were taken by EOS Ecology at the earliest possible opportunity (24/07/13) and showed e.coli readings were below the 2.3 MPN/ml limit; warning signs were subsequently removed.

The shellfish samples were taken soon after the June storm event (18/06-22/06), and the high e.coli figures likely to be due to the large number of pump station overflows and capacity problems with the network during this time.

No complaints regarding the ocean outfall have been received this quarter. This report and supporting documentation will be submitted to Environment Canterbury.