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Christchurch Wastewater Treatment Plant

Quarterly Monitoring Report

November 2013 – January 2014

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Summary

This report summarises the results of parameters monitored by the Christchurch Wastewater Treatment Plant (CWTP) over the period November 2013 – January 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 consent, almost samples were collected during the monitoring period and all monitored parameters achieved the required standards. An error by the lab sampling team resulted in a missed 24hour repeat beach sample, although the next routine sample was shown to be within requirements. The annual pesticide and hydrocarbons tests were also missed and will be included in the next quarterly report. The Laboratory team will be employing new practices to improve sampling reliability.

The project to replace earthquake damaged pond structures by building a new influent structure in Pond 1 is in operation, although the original damaged pipe under Cuthberts Rd cannot be capped until the insurance agencies have completed their investigation.

Contractors working on the Southern Toe Drain upgrade project have discovered earthquake damage that has significantly delayed the project. A layer of liquefaction in the culvert has significantly changed the construction of the raised weir, as it required both dewatering and excavation of the site. We also found earthquake damaged to the pump station, requiring dewatering and repairs to the concrete pump well. The weir and concrete works have been completed, and the contents of the toe drain are being pumping into the oxidation ponds.

Christchurch Wastewater Treatment Plant Contents

Quarterly Monitoring Report

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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 November 2013 – January 2014 CRC051724

Consent Condition	Parameter	Compliance Condition	Compliance			
			Nov 13	Dec 13	Jan 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
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. A fault developed in the pressure sensor for the ocean outfall that has since been repaired.

CWTP Ocean Outfall Daily Flow Totals

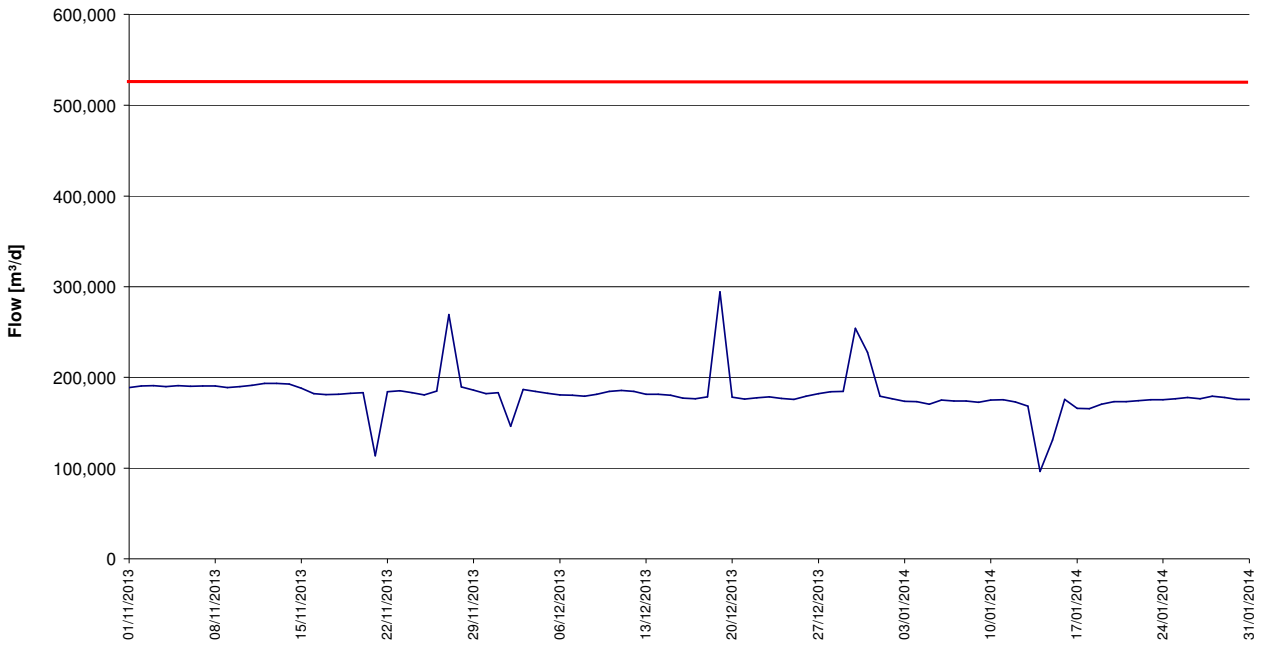


Figure 1.2.1 - Daily Outfall Flow Totals

CWTP Ocean Outfall Peak Discharge Flow Rate (m3/s)

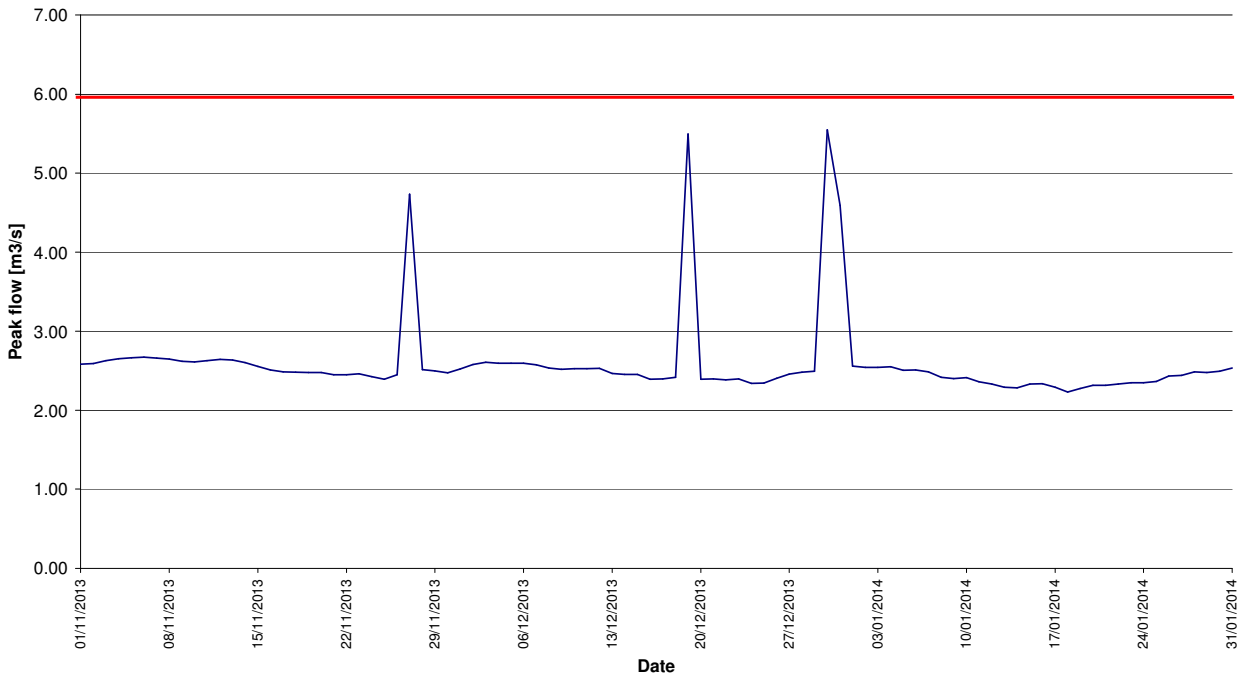


Figure 1.2.2 - Daily Peak Outfall Flows

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 November – January 2014 CRC051724

Consent Condition	Parameter	Compliance Condition	Compliance			
			Nov 13	Dec 13	Jan 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 Compliance

Almost all samples were collected and analysed. An annual sample for pesticide and hydrocarbons (condition 13g) was not taken by the sampling team and will be included in the next quarterly consent report.

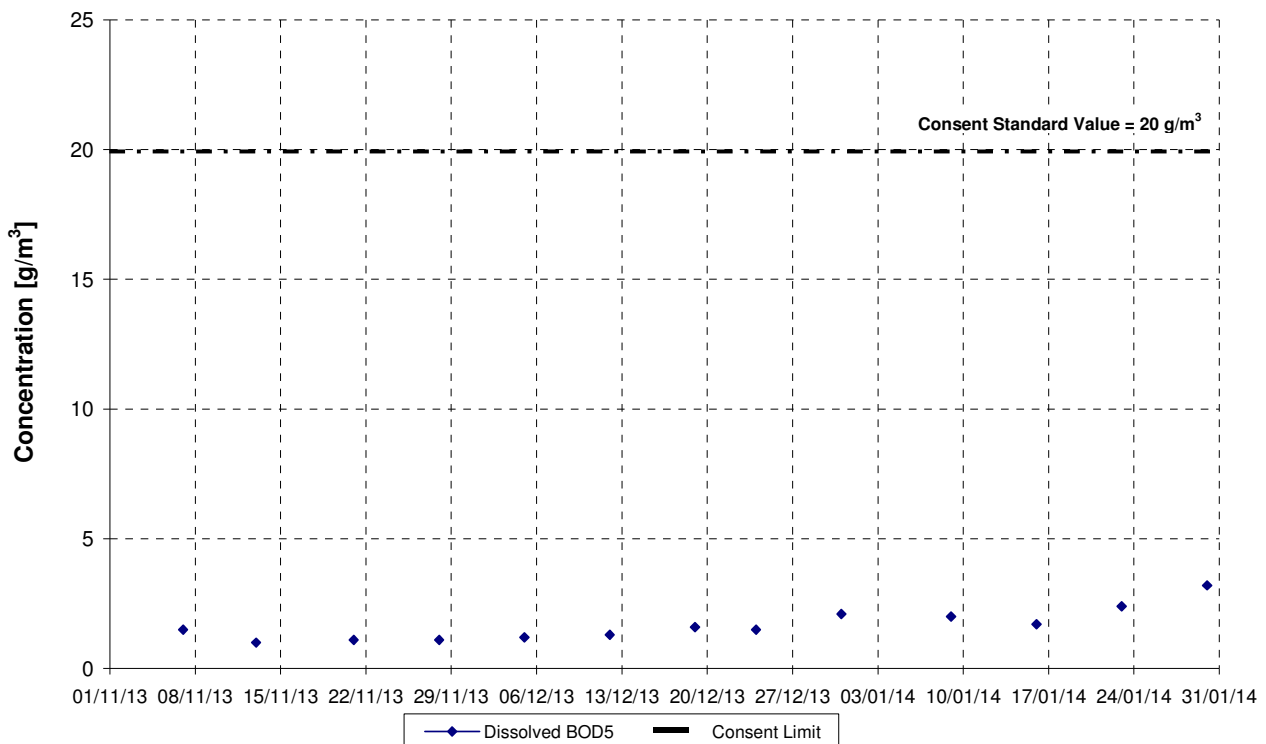
1.5 Dissolved BOD₅ Compliance

The median dissolved BOD₅ concentration for the period November – January 2014 was 1.5g/m³. This is slightly lower than the median concentrations in the previous quarter and similar to the same quarter in 2012-13. There were no exceedances of the standard value (20.0 g/m³) in the current monitoring quarter.

Table 1.5.1 Pond Discharge Dissolved BOD₅

Median Value [g/m ³] Current Monitoring Quarter (Nov 2013 – Jan 2014)	1.5	Number of Exceedances Current Monitoring Quarter (Nov 2013 – Jan 2014)	0
Median Value [g/m ³] Previous Monitoring Quarter (Aug 2013 – Oct 2013)	1.8	Number of Exceedances Previous Monitoring Quarter (Aug 2013 – Oct 2013)	0
Median Value [g/m ³] Same Monitoring Quarter of Previous Year (Nov 2012 – Jan 2013)	1.5	Number of Exceedances Same Monitoring Quarter of Previous Year (Nov 2012 – Jan 2013)	0

1.5.2 Pond Discharge Dissolved BOD₅



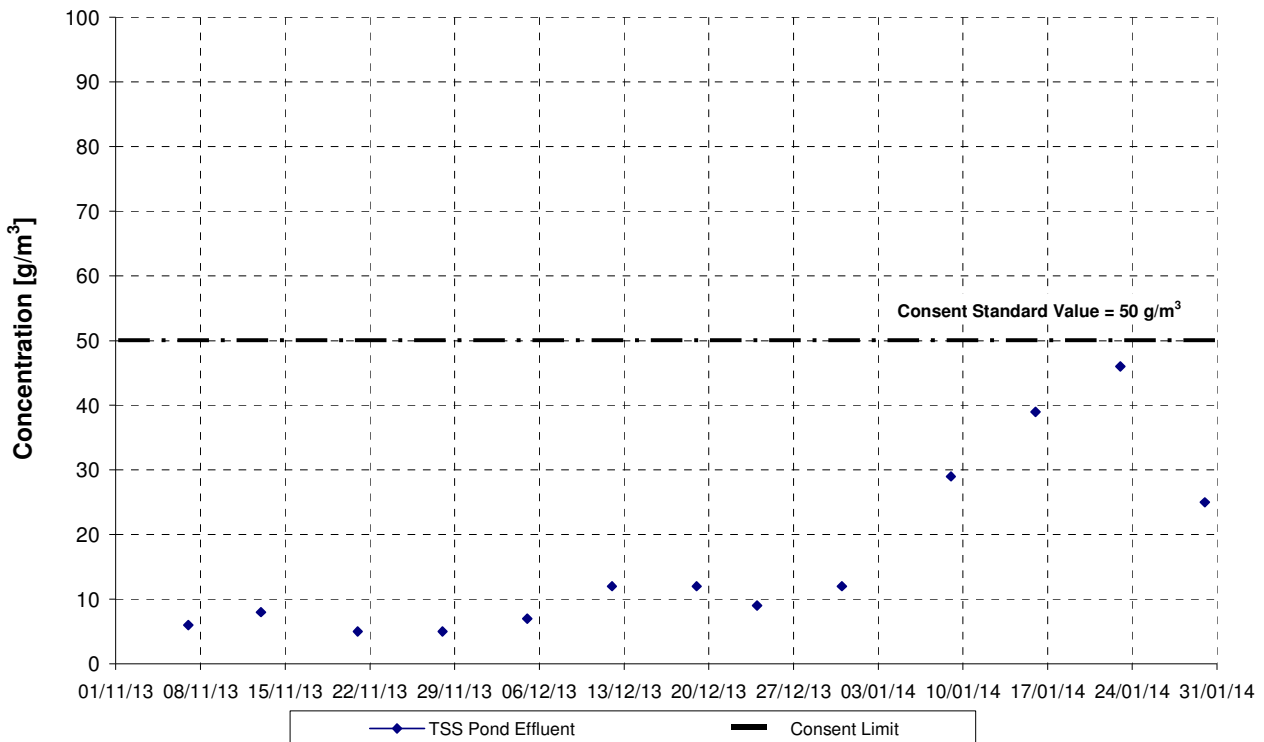
1.6 Total Suspended Solids Compliance

The median total suspended solids concentration for the period November 2013 – January 2014 was 12g/m³. This is higher than both the previous quarter and lower than the same quarter in 2012-13. There were no exceedances of the standard value (50 g/m³).

Table 1.6.1 Pond Discharge Total Suspended Solids

Median Value [g/m ³] Current Monitoring Quarter (Nov 2013 – Jan 2014)	12	Number of Exceedances Current Monitoring Quarter (Nov 2013 – Jan 2014)	0
Median Value [g/m ³] Previous Monitoring Quarter (Aug 2013 – Oct 2013)	4	Number of Exceedances Previous Monitoring Quarter (Aug 2013 – Oct 2013)	0
Median Value [g/m ³] Same Monitoring Quarter of Previous Year (Nov 2012 – Jan 2013)	16	Number of Exceedances Same Monitoring Quarter of Previous Year (Nov 2012 – Jan 2013)	2

1.6.2 Pond Discharge Total Suspended Solids



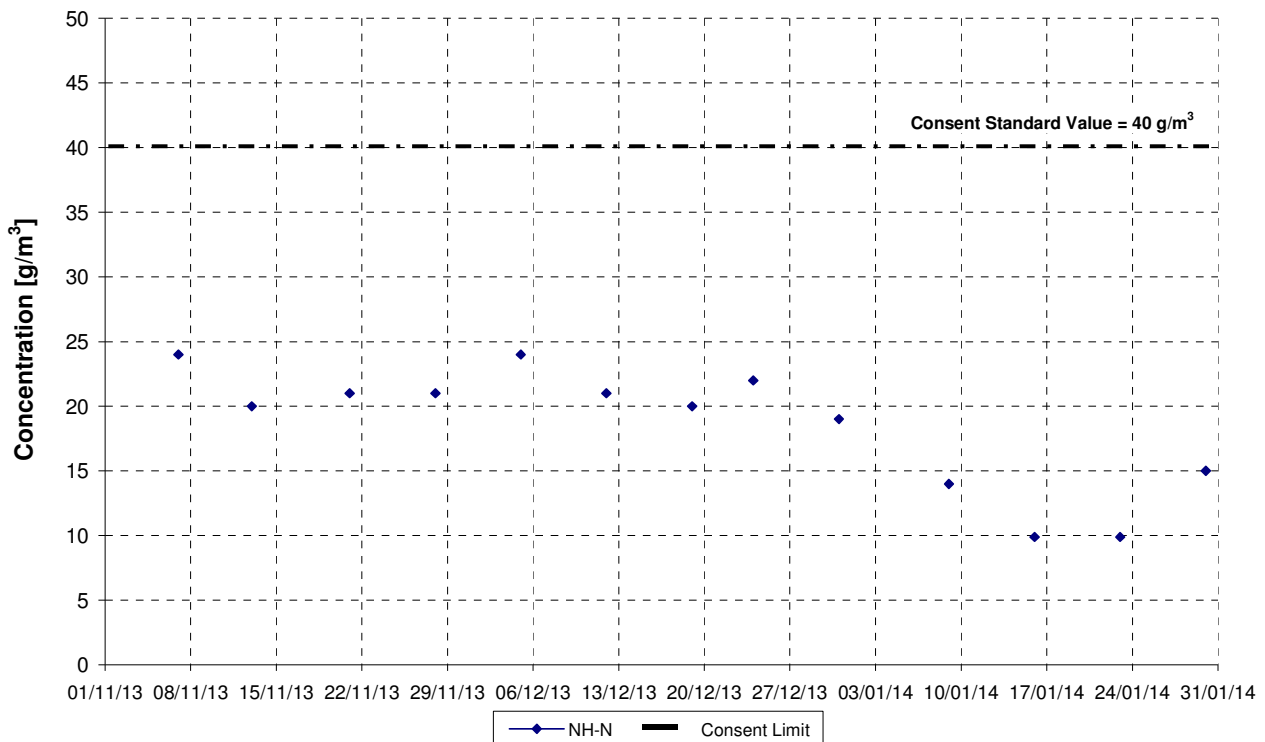
1.7 Ammonia Nitrogen Compliance

The median total ammonia nitrogen concentration for the period November 2013 – January 2014 was 20 g/m³. This was lower than the previous quarter and lower than the same quarter last year. There were no exceedances of the 40 g/m³ limit.

Table 1.7.1 Pond Discharge Ammoniacal Nitrogen

Median Value [g/m ³] Current Monitoring Quarter (Nov 2013 – Jan 2014)	20	Number of Exceedances Current Monitoring Quarter (Nov 2013 – Jan 2014)	0
Median Value [g/m ³] Previous Monitoring Quarter (Aug 2013 – Oct 2013)	22	Number of Exceedances Previous Monitoring Quarter (Aug 2013 – Oct 2013)	0
Median Value [g/m ³] Same Monitoring Quarter of Previous Year (Nov 2012 – Jan 2013)	22	Number of Exceedances Same Monitoring Quarter of Previous Year (Nov 2012 – Jan 2013)	0

1.7.1 Pond Discharge Ammoniacal Nitrogen



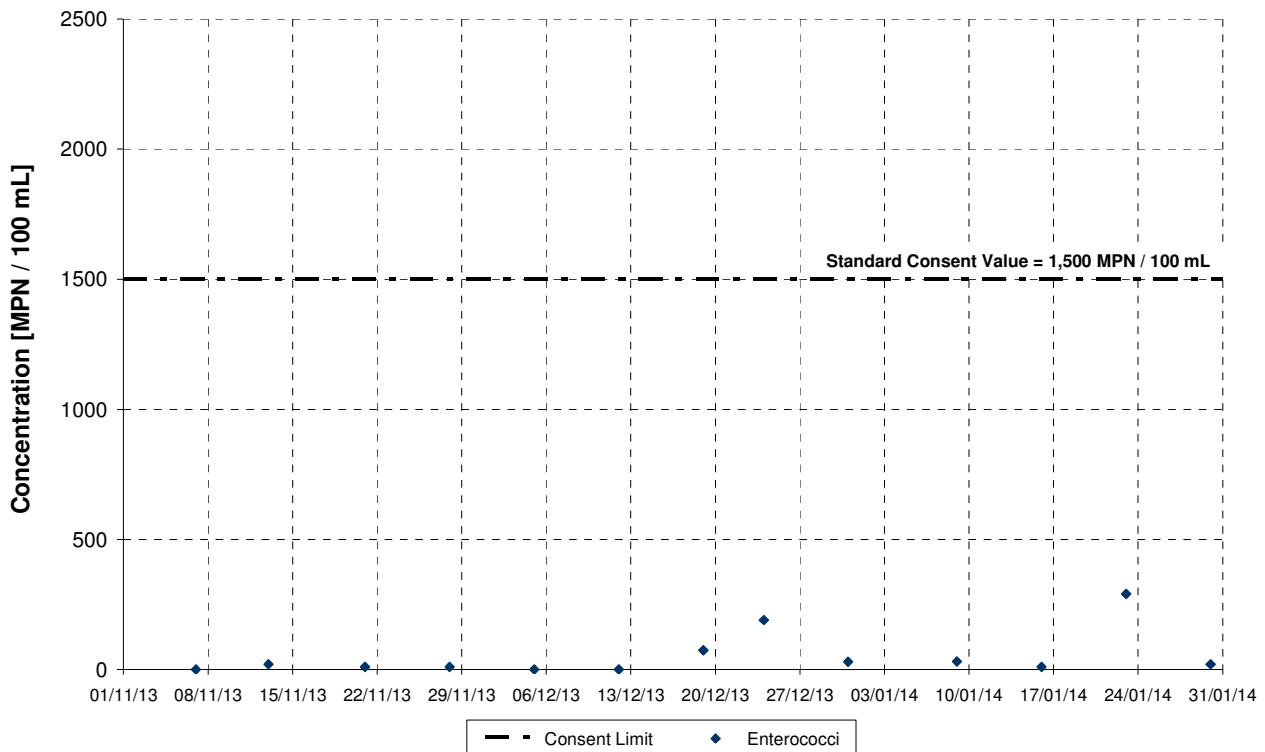
1.8 Enterococci Monitoring

The median enterococci concentration in the November 2013 – January 2014 reporting period was 25 MPN/100mL. This was higher than previous quarter and lower than the same quarter last year. There were no exceedances of the 1,500 MPN/100ml limit during the reporting quarter.

Table 1.8.1 Pond Discharge Enterococci

Median Value [MPN/100mL] Current Monitoring Quarter (Nov 2013 – Jan 2014)	25	Number of Exceedances Current Monitoring Quarter (Nov 2013 – Jan 2014)	0
Median Value [MPN/100mL] Previous Monitoring Quarter (Aug 2013 – Oct 2013)	10	Number of Exceedances Previous Monitoring Quarter (Aug 2013 – Oct 2013)	0
Median Value [MPN/100mL] Same Monitoring Quarter of Previous Year (Nov 2012 – Jan 2013)	41	Number of Exceedances Same Monitoring Quarter of Previous Year (Nov 2012 – Jan 2013)	0

1.8.1 Pond Discharge Enterococci



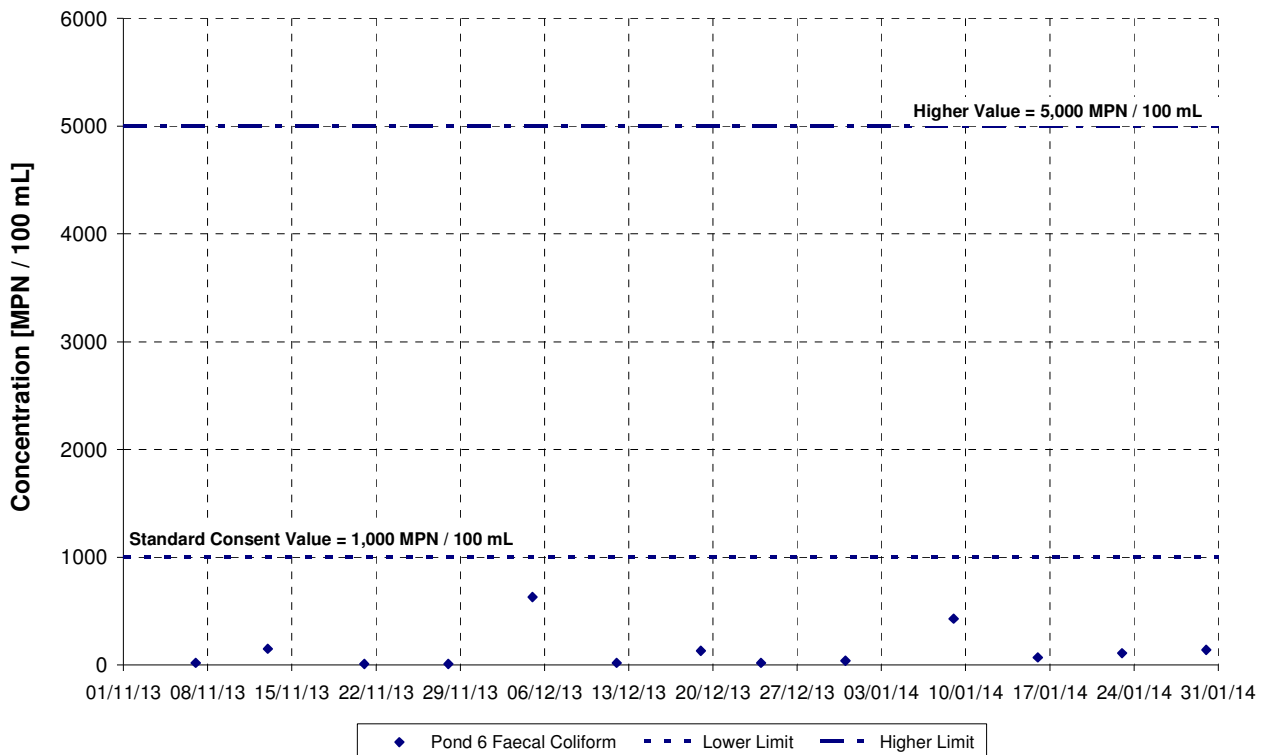
1.9 Faecal Coliform Compliance

The median concentration for the reporting period was 70 MPN/100 mL, which is higher than the median for the previous quarter, and lower than the same quarter in 2012-13. There was no exceedances of the higher or standard values.

Table 1.9.1 Pond Discharge Faecal Coliforms

Median Value [MPN/100mL] Current Monitoring Quarter (Nov 2013 – Jan 2014)	70	Number of Exceedances Current Monitoring Quarter (Nov 2013 – Jan 2014)	0
Median Value [MPN/100mL] Previous Monitoring Quarter (Aug 2013 – Oct 2013)	41	Number of Exceedances Previous Monitoring Quarter (Aug 2013 – Oct 2013)	0
Median Value [MPN/100mL] Same Monitoring Quarter of Previous Year (Nov 2012 – Jan 2013)	140	Number of Exceedances Same Monitoring Quarter of Previous Year (Nov 2012 – Jan 2013)	1

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. Sampling for condition 22a is not due until Feb/Mar 2015.

Table 2.1.1 Receiving Environment Water Quality Consent Compliance November 2013 – January 2014

Consent Condition	Parameter	Compliance Condition	Compliance
			Nov 13 – Jan 14
18	Faecal Coliforms	Sampled and Analysed	☹
	Enterococci	Sampled and Analysed	☺
22a	Temperature	2 yearly	n/a
	DO	2 yearly	n/a
	Salinity	2 yearly	n/a
	Total Suspended Solids	2 yearly	n/a
	Nitrogen Oxides	2 yearly	n/a
	Ammoniacal Nitrogen	2 yearly	n/a
	Dissolved Reactive Phosphorus	2 yearly	n/a
	Chlorophyll-a	2 yearly	n/a
	Trace Metals (arsenic, cadmium, copper, chromium, lead, nickel and zinc)	2 yearly	n/a
	Faecal Coliforms	2 yearly	n/a
	Enterococci	2 yearly	n/a
Phytoplankton Species	2 yearly	n/a	

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

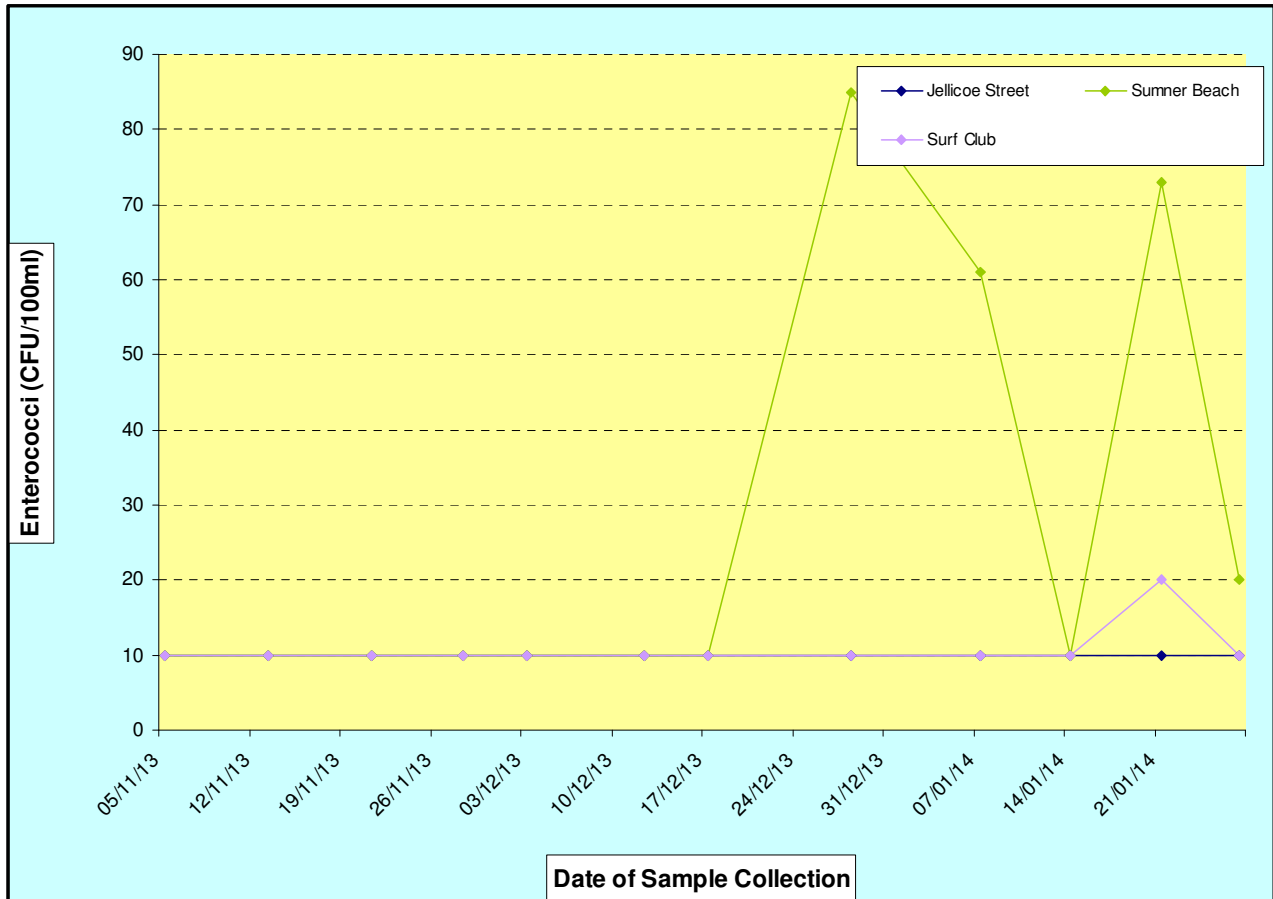
2.2 Comments on Compliance

Almost all results for the Pegasus Bay area were within consent for November 2013 – January 2014.

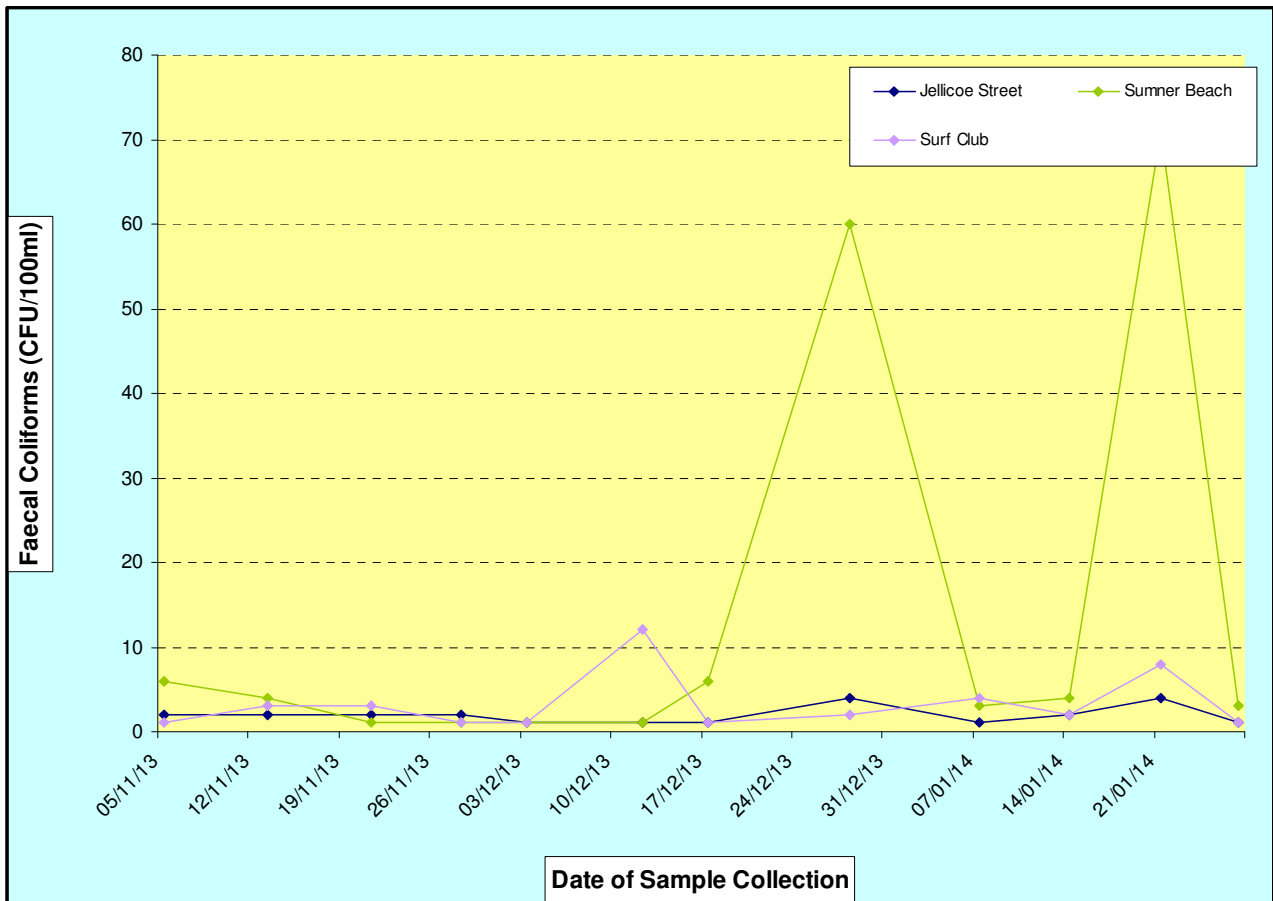
Beach Water Quality Analysis Results

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. 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.

2.2.1 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 November – Jan 2014 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 November 2013 – January 2014

Consent Condition	Parameter	Frequency	Compliance Condition	Compliance
				Nov 13 – Jan 14
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	☺
36	Community Liaison Group	Annually	Held and minuted	☺

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

2.4 Comments on Compliance

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

The new pipeline running Cuthberts Road is operational, although the project will not be complete until the old pipes are fully capped (which will be done after inspection by CCC insurance agencies).

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