



CHRISTCHURCH

CITY COUNCIL • YOUR PEOPLE • YOUR CITY

Christchurch Wastewater Treatment Plant

Quarterly Monitoring Report

February – April 2021

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 Feb - Apr 2021.docx
Contact: Lee Liaw

Summary

This report summarises the results of parameters monitored by the Christchurch Wastewater Treatment Plant (CWTP) over the period November - January 2021 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 samples were collected during the monitoring period and all monitored parameters achieved the required standards.

Christchurch Wastewater Treatment Plant Contents

Quarterly Monitoring Report

February to April 2021

1	OUTFALL DISCHARGE	4
1.1	<i>Resource Consent Conditions</i>	4
1.2	Comments on Compliance.....	4
1.3	<i>Resource Consent Standard Conditions.....</i>	6
1.4	<i>Comments on Compliance</i>	6
1.5	<i>Dissolved BOD₅ 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
2	RECEIVING ENVIRONMENT MONITORING IN PEGASUS BAY.....	12
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>	14
2.5	<i>Comments on Compliance</i>	14

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 CRC051724

Consent Condition	Parameter	Compliance Condition	Compliance			
			Feb 21	Mar 21	Apr 21	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
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. Visual inspection and maintenance of the diffusers were completed in March this year, as per the email sent to ECan 25/03/21.

CWTP Ocean Outfall Daily Flow Totals

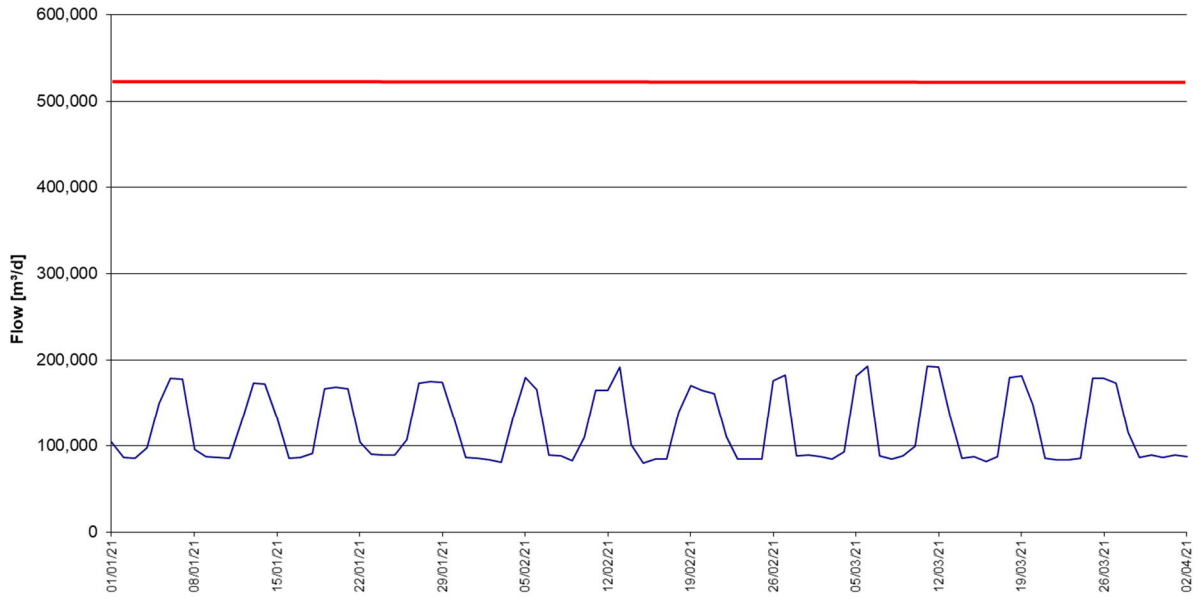


Figure 1.2.1 - Daily Outfall Flow Totals

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

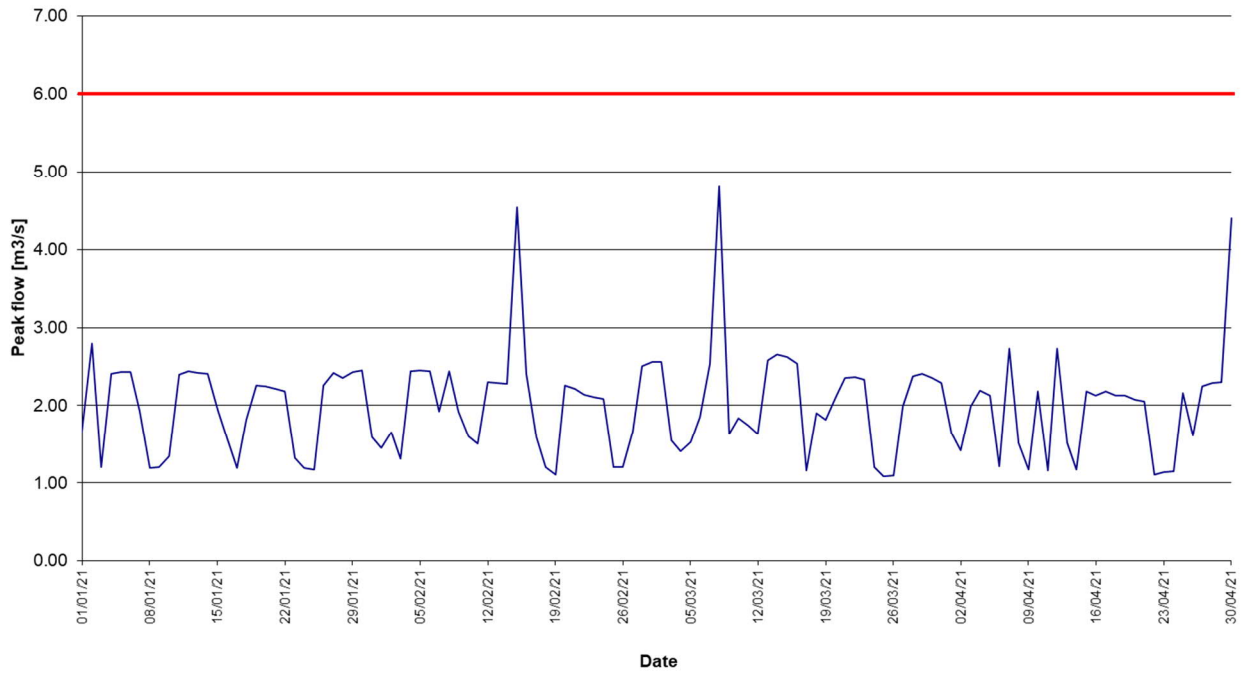


Figure 1.2.2 - Daily Peak Outfall Flows

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 2021 CRC051724

Consent Condition	Parameter	Compliance Condition	Compliance			
			Feb 21	Mar 21	Apr 21	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

All samples were collected and analysed. There were 4 exceedances of the dissolved BOD limit and 6 exceedances of the total suspended solids limit, however this is not a non-compliance with the consent conditions. All exceedances were associated with significant algal growth due to the warm weather and civil works to allow non-chemical midge reduction. The exceedances for TSS were less than seven below the threshold for Condition 15. The exceedances for dissolved BOD were less than seven, below the threshold for condition 15.

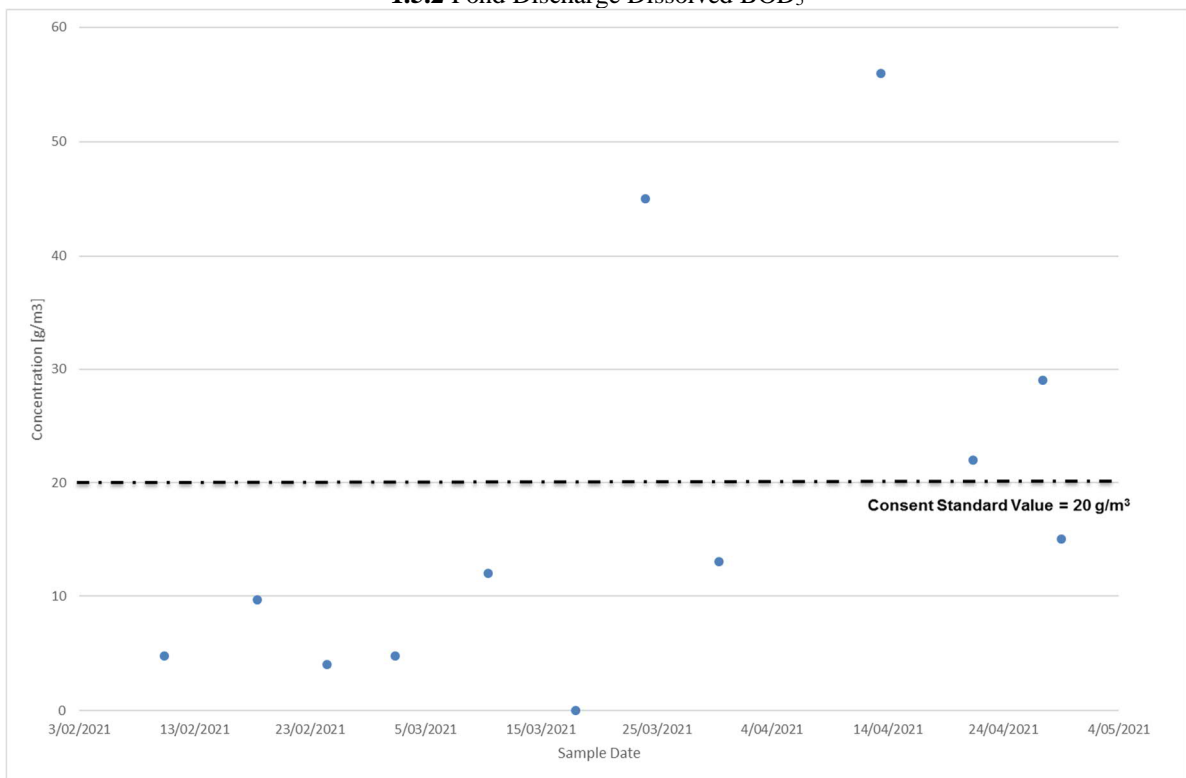
1.5 Dissolved BOD₅ Compliance

The median dissolved BOD₅ concentration for the reporting period was 18.2g/m³. This is higher than the median concentrations in the previous quarter and higher than the same quarter in 2020. There were four 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 (February 2021 – April 2021)	18.2	Number of Exceedances Current Monitoring Quarter (February 2021 – April 2021)	4
Median Value [g/m ³] Previous Monitoring Quarter (November 2020 – January 2021)	2.2	Number of Exceedances Previous Monitoring Quarter (November 2020 – January 2021)	0
Median Value [g/m ³] Same Monitoring Quarter of Previous Year (February 2020 – April 2020)	5.6	Number of Exceedances Same Monitoring Quarter of Previous Year (February 2020 – April 2020)	0

1.5.2 Pond Discharge Dissolved BOD₅



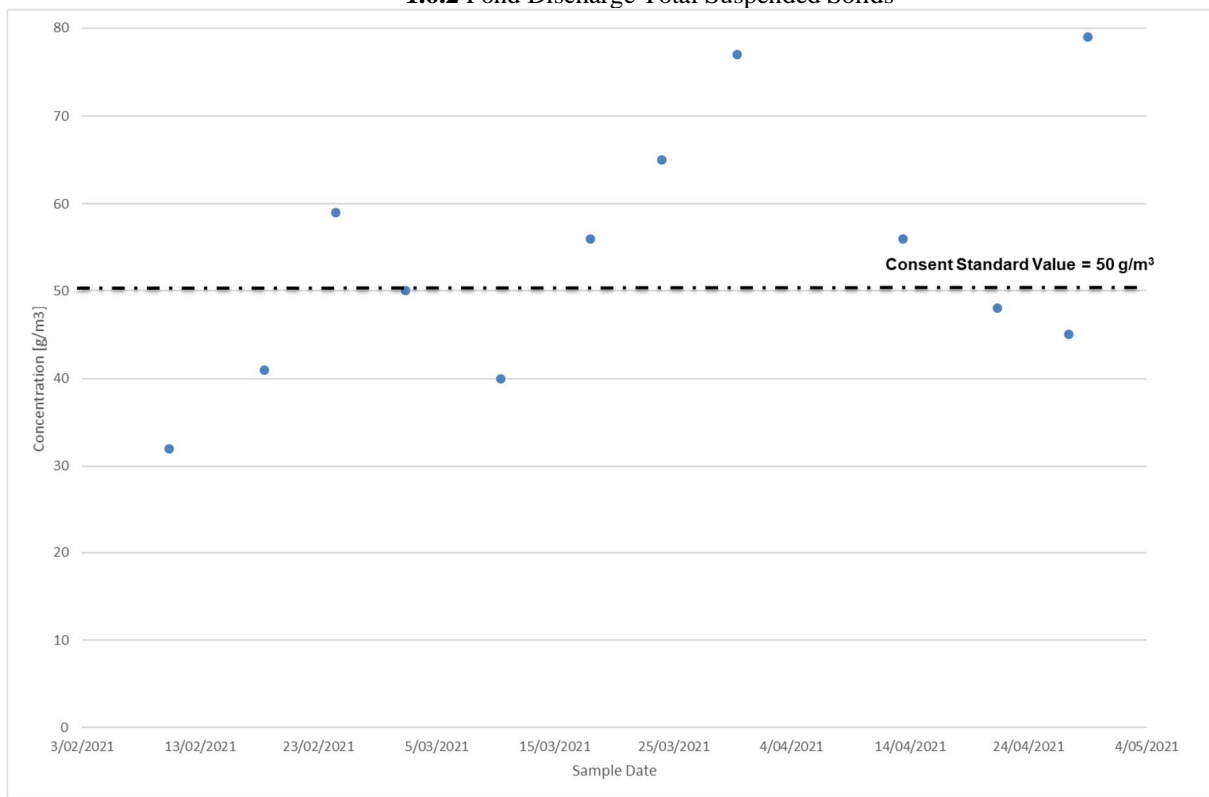
1.6 Total Suspended Solids Compliance

The median total suspended solids concentration for the monitoring period was 53 g/m³. This is higher than the previous quarter and lower than the same quarter last year. There were 11 exceedances of the standard value (50 g/m³) this quarter.

Table 1.6.1 Pond Discharge Total Suspended Solids

Median Value [g/m ³] Current Monitoring Quarter (February 2021 – April 2021)	53	Number of Exceedances Current Monitoring Quarter (February 2021 – April 2021)	6
Median Value [g/m ³] Previous Monitoring Quarter (November 2020 – January 2021)	30	Number of Exceedances Previous Monitoring Quarter (November 2020 – January 2021)	0
Median Value [g/m ³] Same Monitoring Quarter of Previous Year (February 2020 – April 2020)	62	Number of Exceedances Same Monitoring Quarter of Previous Year (February 2020 – April 2020)	11

1.6.2 Pond Discharge Total Suspended Solids



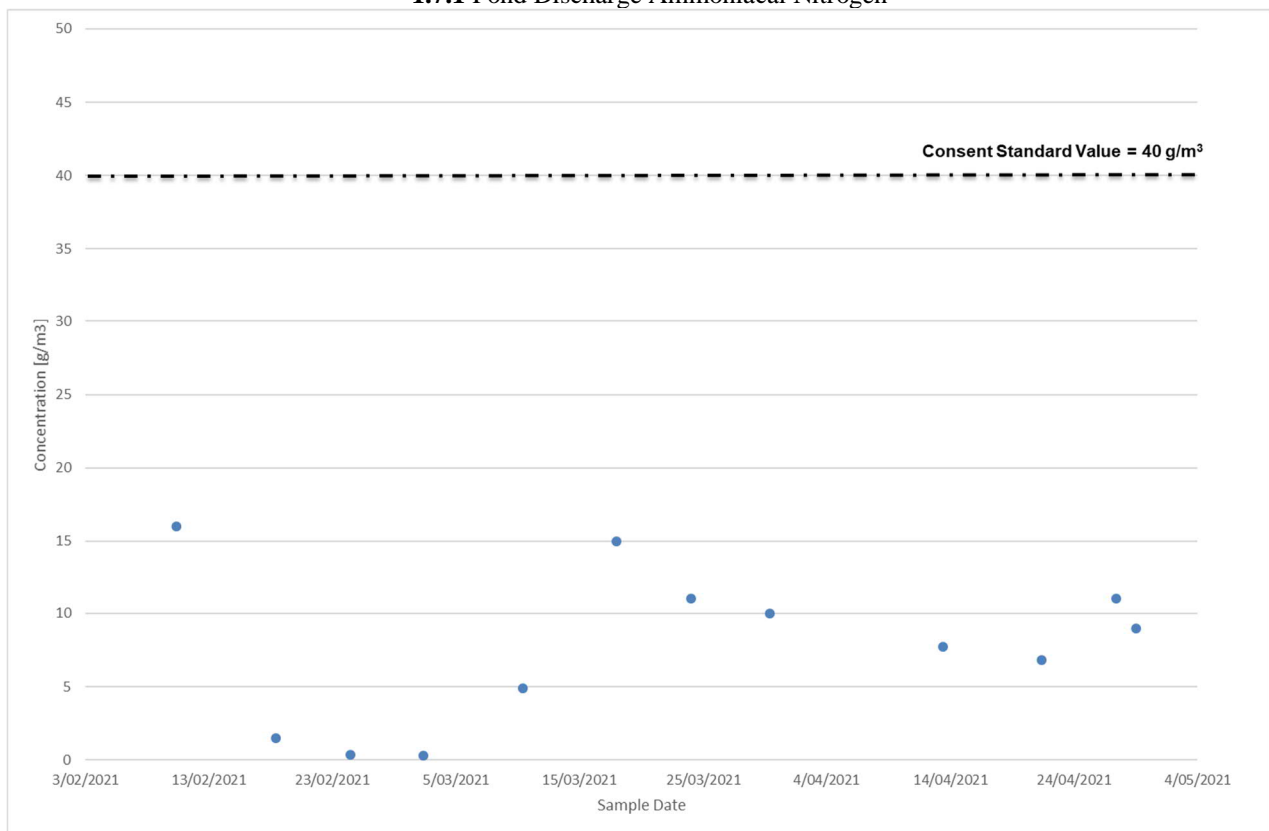
1.7 Ammonia Nitrogen Compliance

The median total ammonia nitrogen concentration for the monitoring period was 19 g/m³. This was lower than the previous quarter and equal to the same quarter last year. There were zero exceedances of the 40 g/m³ limit.

Table 1.7.1 Pond Discharge Ammoniacal Nitrogen

Median Value [g/m ³] Current Monitoring Quarter (February 2021 – April 2021)	7.9	Number of Exceedances Current Monitoring Quarter (February 2021 – April 2021)	0
Median Value [g/m ³] Previous Monitoring Quarter (November 2020 – January 2021)	19	Number of Exceedances Previous Monitoring Quarter (November 2020 – January 2021)	0
Median Value [g/m ³] Same Monitoring Quarter of Previous Year (February 2020 – April 2020)	0.21	Number of Exceedances Same Monitoring Quarter of Previous Year (February 2020 – April 2020)	0

1.7.1 Pond Discharge Ammoniacal Nitrogen



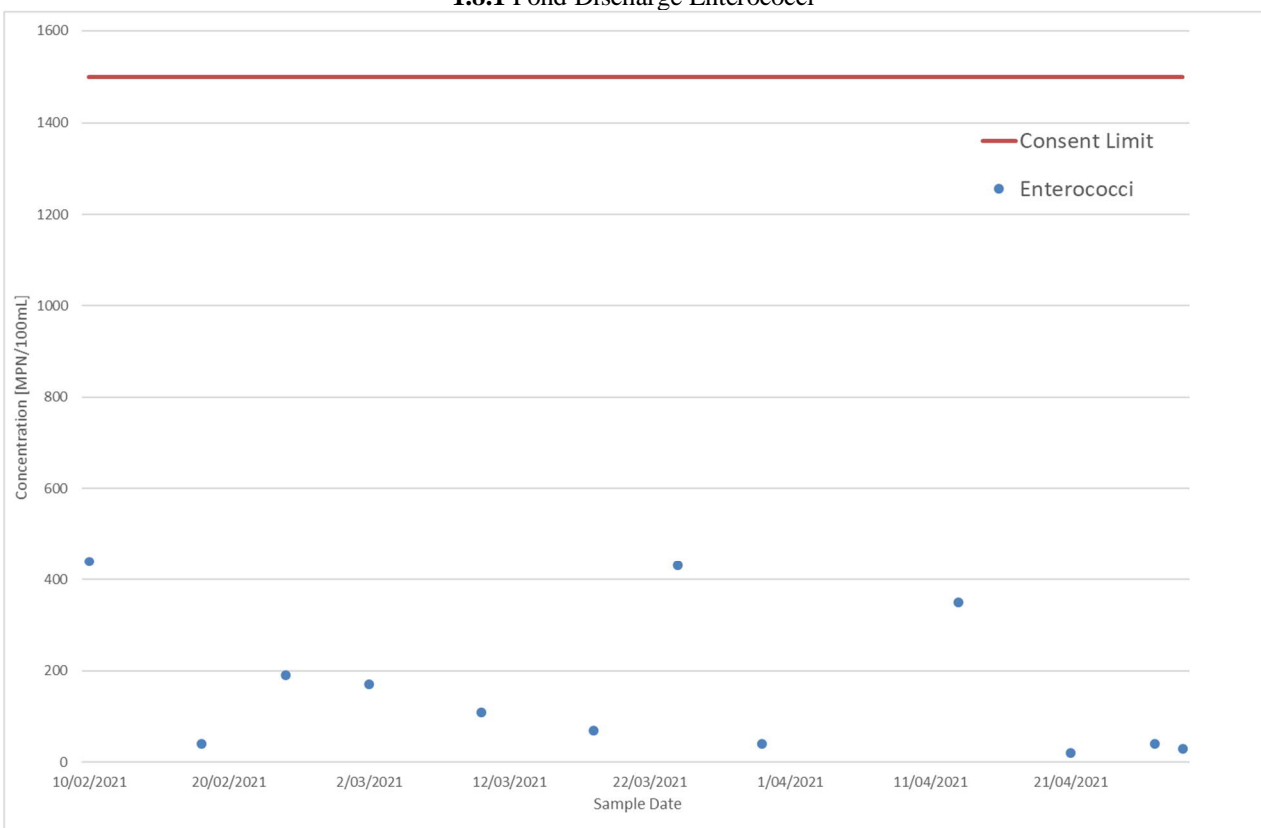
1.8 Enterococci Monitoring

The median enterococci concentration during the reporting period was 150.2 MPN/100mL. This was higher than previous quarter and higher than the same quarter last year. There was no exceedances of the 1,500 MPN/100ml limit during the reporting quarter.

Table 1.8.1 Pond Discharge Enterococci

Median Value [g/m ³] Current Monitoring Quarter (November 2020 – January 2021)	150.2	Number of Exceedances Current Monitoring Quarter (November 2020 – January 2021)	0
Median Value [g/m ³] Previous Monitoring Quarter (August 2020 – October 2020)	80.5	Number of Exceedances Previous Monitoring Quarter (August 2020 – October 2020)	1
Median Value [g/m ³] Same Monitoring Quarter of Previous Year (November 2019 – January 2020)	10	Number of Exceedances Same Monitoring Quarter of Previous Year (November 2019 – January 2020)	0

1.8.1 Pond Discharge Enterococci



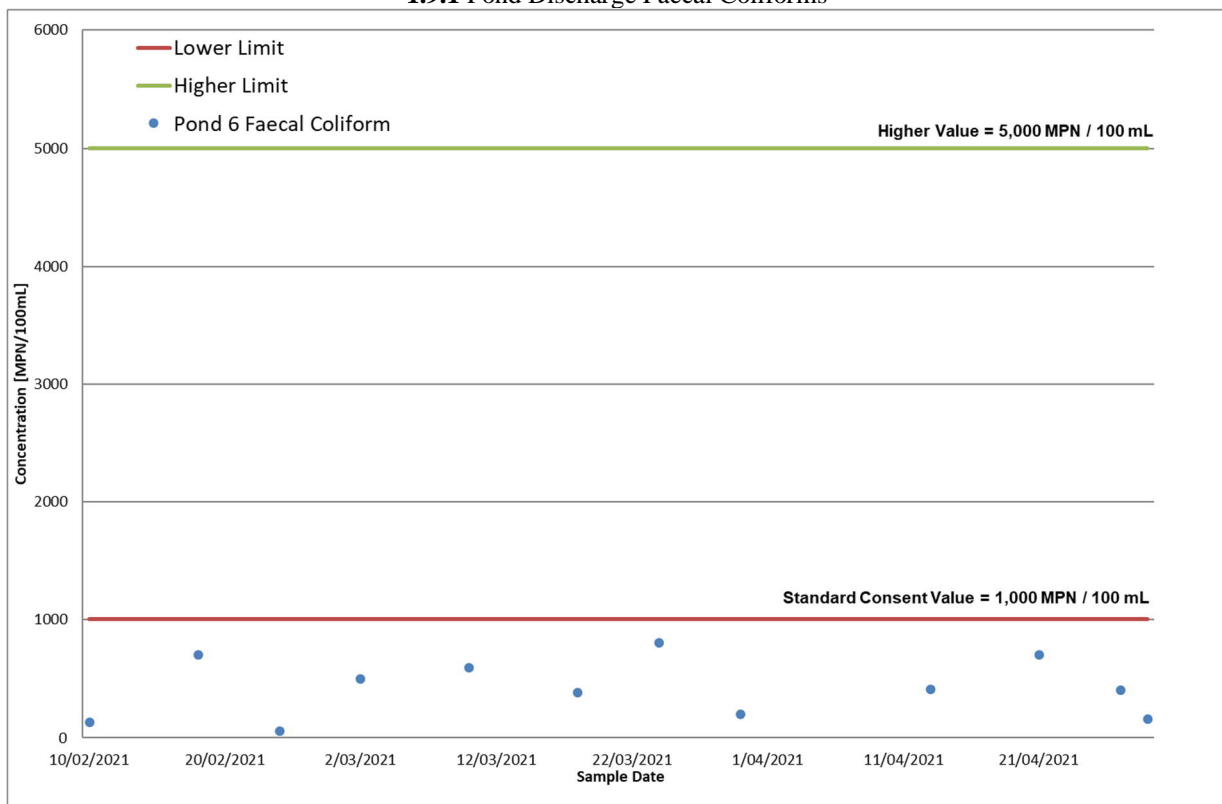
1.9 Faecal Coliform Compliance

The median concentration for the reporting period was 130 MPN/100 mL, which is higher than the median for the previous quarter, and higher than the same quarter last year. There were no exceedances of the standard faecal coliform limit.

Table 1.9.1 Pond Discharge Faecal Coliforms

Median Value [g/m ³] Current Monitoring Quarter (November 2020 – January 2021)	394	Number of Exceedances Current Monitoring Quarter (November 2020 – January 2021)	0
Median Value [g/m ³] Previous Monitoring Quarter (August 2020 – October 2020)	130	Number of Exceedances Previous Monitoring Quarter (August 2020 – October 2020)	0
Median Value [g/m ³] Same Monitoring Quarter of Previous Year (November 2019 – January 2020)	130	Number of Exceedances Same Monitoring Quarter of Previous Year (November 2019 – January 2020)	0

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 done 26 February 2021, and emailed to ECan 21/04/21.

Table 2.1.1 Receiving Environment Water Quality Consent Compliance

Consent Condition	Parameter	Compliance Condition	Compliance
			Feb – Apr 21
18	Faecal Coliforms	Sampled and Analysed	☺
	Enterococci	Sampled and Analysed	☹
22a	Temperature	2 yearly	na
	DO	2 yearly	na
	Salinity	2 yearly	na
	Total Suspended Solids	2 yearly	na
	Nitrogen Oxides	2 yearly	na
	Ammoniacal Nitrogen	2 yearly	na
	Dissolved Reactive Phosphorus	2 yearly	na
	Chlorophyll-a	2 yearly	na
	Trace Metals	2 yearly	na
	Faecal Coliforms	2 yearly	na
	Enterococci	2 yearly	na
Phytoplankton Species	2 yearly	na	

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

2.2 Comments on Compliance

Most results for the Pegasus Bay area were within consent for the recording period. Both the Jellico St and Sumner beach samples taken 12/02/21 had enterococci measurements in excess 24,000 CFU/100ml. Below is a quote from our lab:

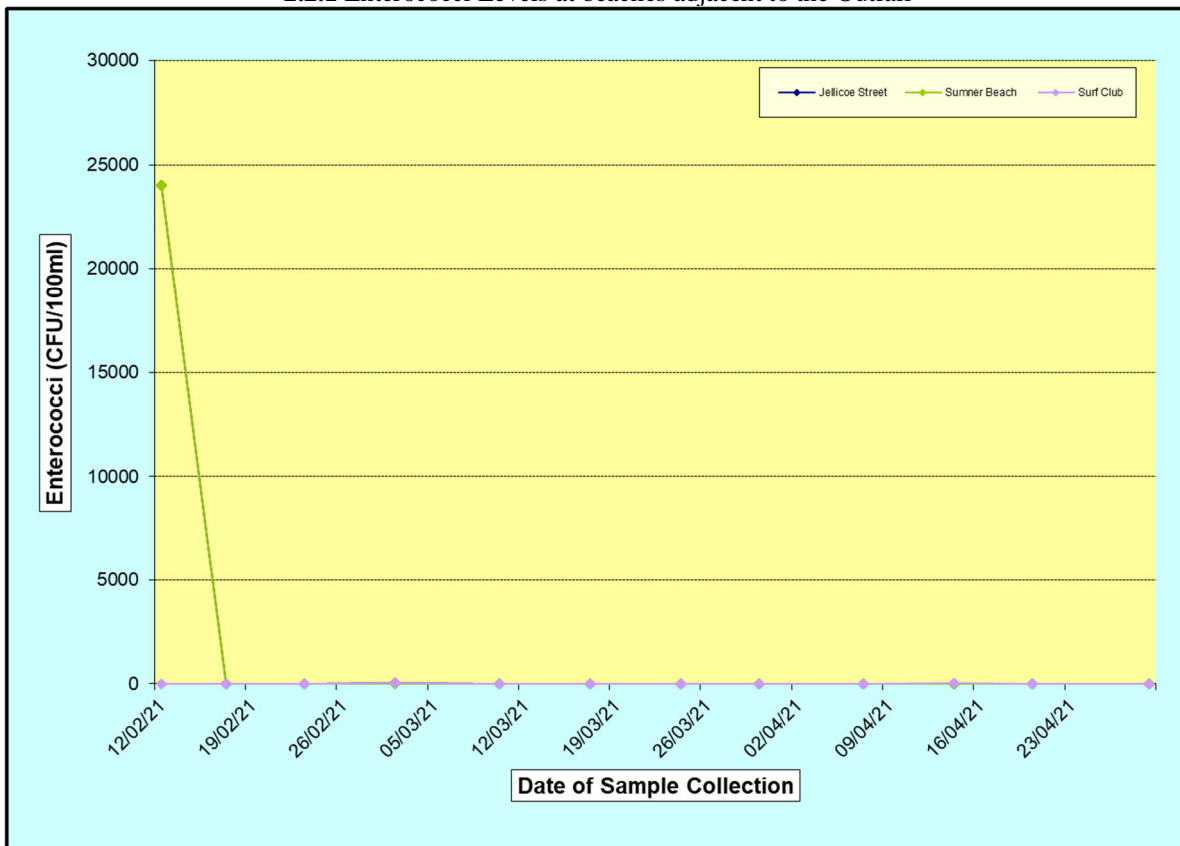
"...samples collected last Friday from Jellicoe St and Sumner Surf Club exceeded the consent limit for enterococci with >24000 enterococci/100 mL detected at both sites. The results are unusual in that they're not backed up with correspondingly high faecal coliform counts. Whilst I am suspicious of their validity, I have elected to report them as the quality control results were normal. It does seem unlikely that this unusual phenomenon would occur in two separate sites, not closely related."

Due to the lab missing the results, the follow-up sample was delayed until 17/02. Both sites were less than 10 CFU/100ml for enterococci on the follow-up sample. As the 12/02 samples showed high enterococci without a correspondingly high faecal coliform, and the results were at background levels 5 days afterwards, this suggests there was a transient phenomenon unrelated to the outfall. There was ~20mm rain Feb 9&10, so there may be the potential for stormwater contamination via the estuary.

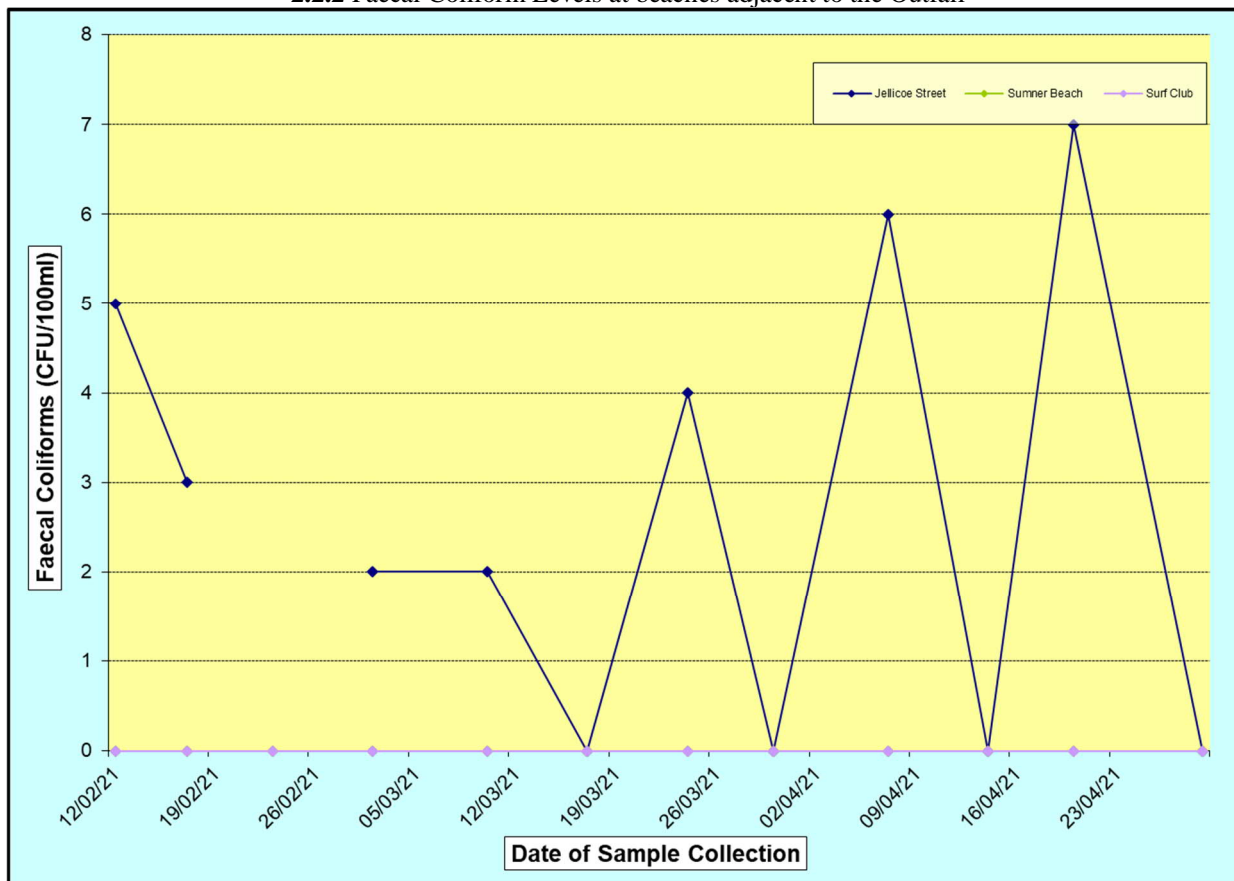
Beach Water Quality Analysis Results

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 data supplied to ECan.

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 monitoring period. These requirements are summarised in Table 2.3.1, and the results are attached as an appendix to this report. Sampling for Conditions 23 – 26 are next due 2022, while condition 36 is now only undertaken if requested by members of the community.

Table 2.3.1 Receiving Environment Monitoring Consent Compliance

Consent Condition	Parameter	Frequency	Compliance Condition	Compliance
				Feb – Apr 21
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	Not done this quarter	—

Key: 😊 Full Compliance 😐 Minor, Isolated or Risk of Non-Compliance 😞 Major or Consistent Non-Compliance

2.4 Comments on Compliance

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

With respect to condition 27 the data supplied in this quarterly report confirms that we have now met the requirement of this consent and may now cease the shellfish monitoring. Bearing in mind that ECan had already allowed us to cease testing for human Enterovirus.