Christchurch City Council

Christchurch Wastewater Treatment Plant

Annual Monitoring Report

July 2020 - June 2021

CHRISTCHURCH WASTEWATER TREATMENT PLANT ● SHUTTLE DRIVE OFF PAGES ROAD

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File: CRC051724 Annual Report For Ocean Outfall 2020-2021.docx1

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Summary

This report summarises the results of parameters monitored by the Christchurch Wastewater Treatment Plant (CWTP) over the period July 2020– June 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. Samples were collected during the monitoring period and the monitored parameters achieved compliance with the required standards.

- Total daily flow volumes and maximum discharge flow rates did not exceed the maximum limits at any time during the 12 month monitoring period.
- There were three minor exceedances (limit 20mg/L) for dissolved BOD with the highest recorded sample of 29mg/L. The 12 month median concentration is 3.9 mg/L
- There were six total suspended solid results that exceeded the consented limit of 50mg/L. The 12 month median is 25mg/L
- Ammoniacal nitrogen sampled did not exceed the consented maximum value (40mg/L) over the last twelve month monitoring period. The median value is 26 mg/L
- There was one Enterococci exceedance over the 12 month monitoring period. The median value (84 MPN/100mL) has increased since the 2019-2020 monitoring period however it is still below the consented maximum.
- Over the 12 month monitoring period there was one significant e. coli non-compliance result of 23,000 CFU/100mL which may be attributed to a significant storm event
- Biannual sampling was undertaken within the 2021 year. Sampling results are included in the appendices to this report.
- The ocean outfall discharge is overall compliant with the resource consent conditions.

Christchurch Wastewater Treatment Plant Contents

Annual Monitoring Report

Jul 2019 – Jun 2020

1 Outfall Discharge

1.1 Resource Consent Conditions

Table 1.1.1 Pond Discharge Consent Compliance for Monitoring Period July 2019 – June 2020 CRC051724

Consent Condition	Parameter	Compliance Condition	Compliance												
			Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	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 were recorded as noted in the quarterly reports.

Figure 1.2.1 - Daily Outfall Flow Totals Jul 2019 – Jun 2020

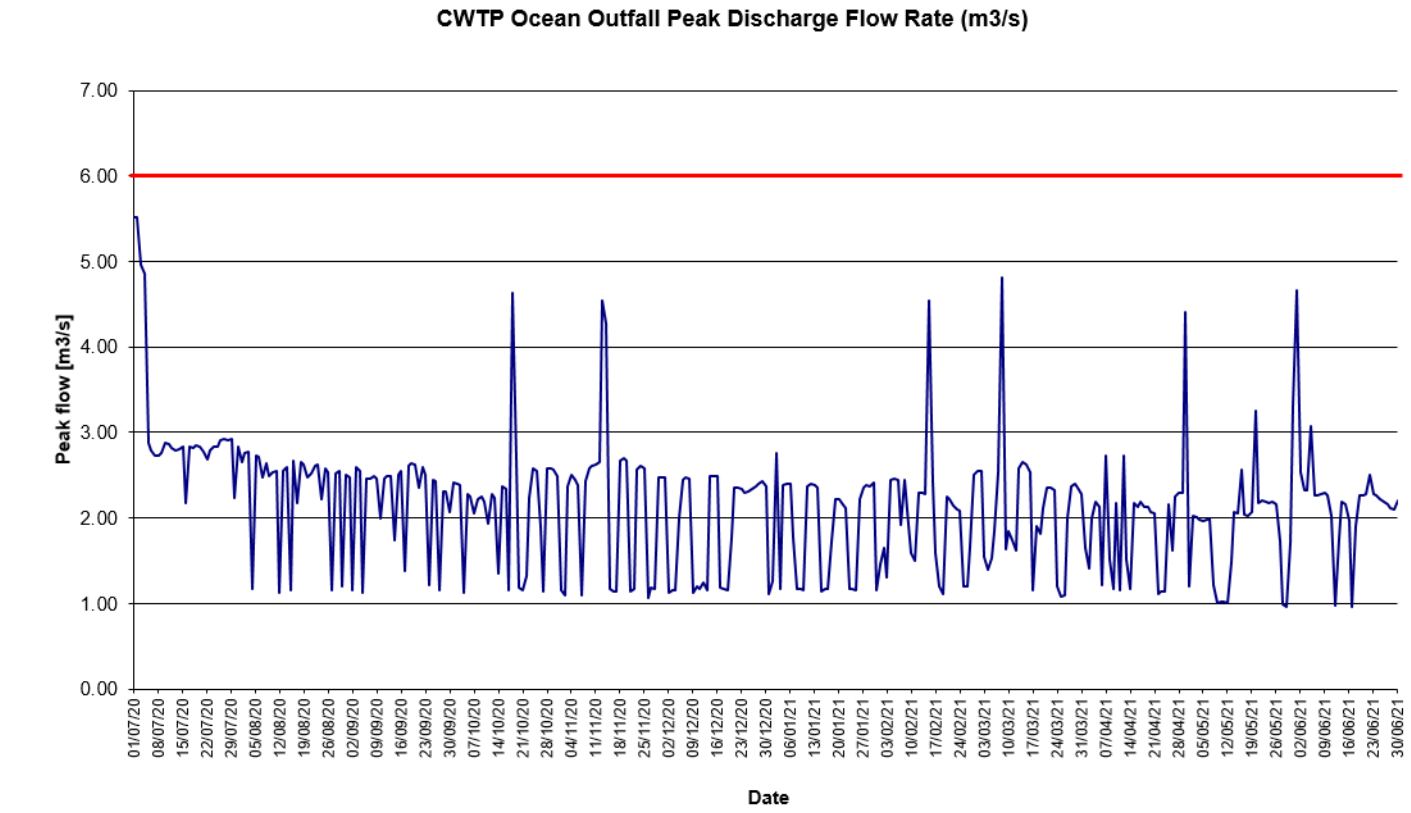
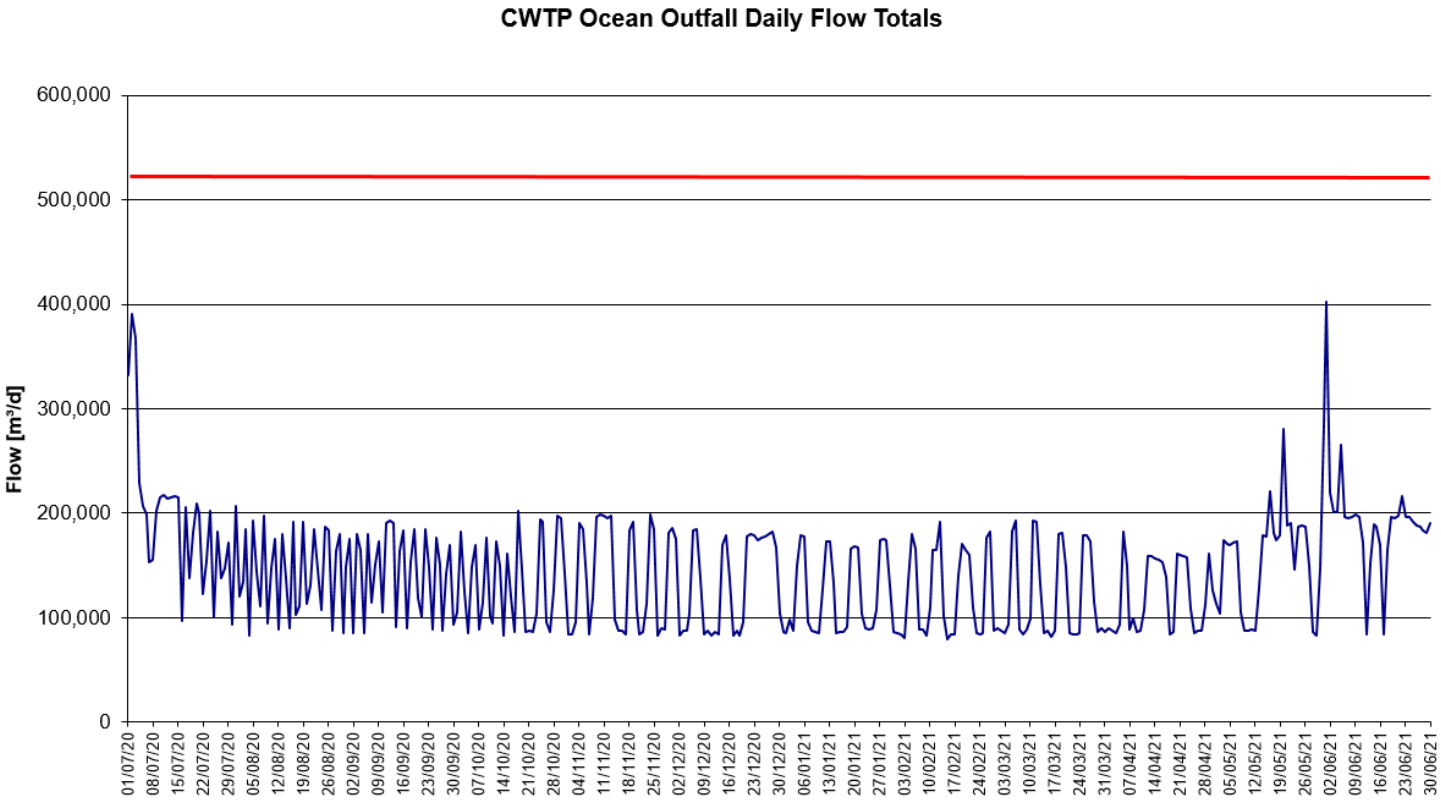


Figure 1.2.2 - Daily Peak Outfall Flows Jul 2019 - Jun 2020



1.3 Resource Consent Standard Conditions

Table 1.3.1 Contaminant Limits Consent Compliance Jul 2019 – Jun 2020 CRC051724

Consent Condition	Parameter	Compliance Condition	Compliance												
			Jul-20	Aug 20	Sep 20	Oct-20	Nov 20	Dec 20	Jan-21	Feb 21	Mar 21	Apr-21	May 21	Jun 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 Resource Consent Standard Conditions

In general, the Ocean Outfall Pumping Station has operated within expected parameters and is broadly similar to last year's performance.

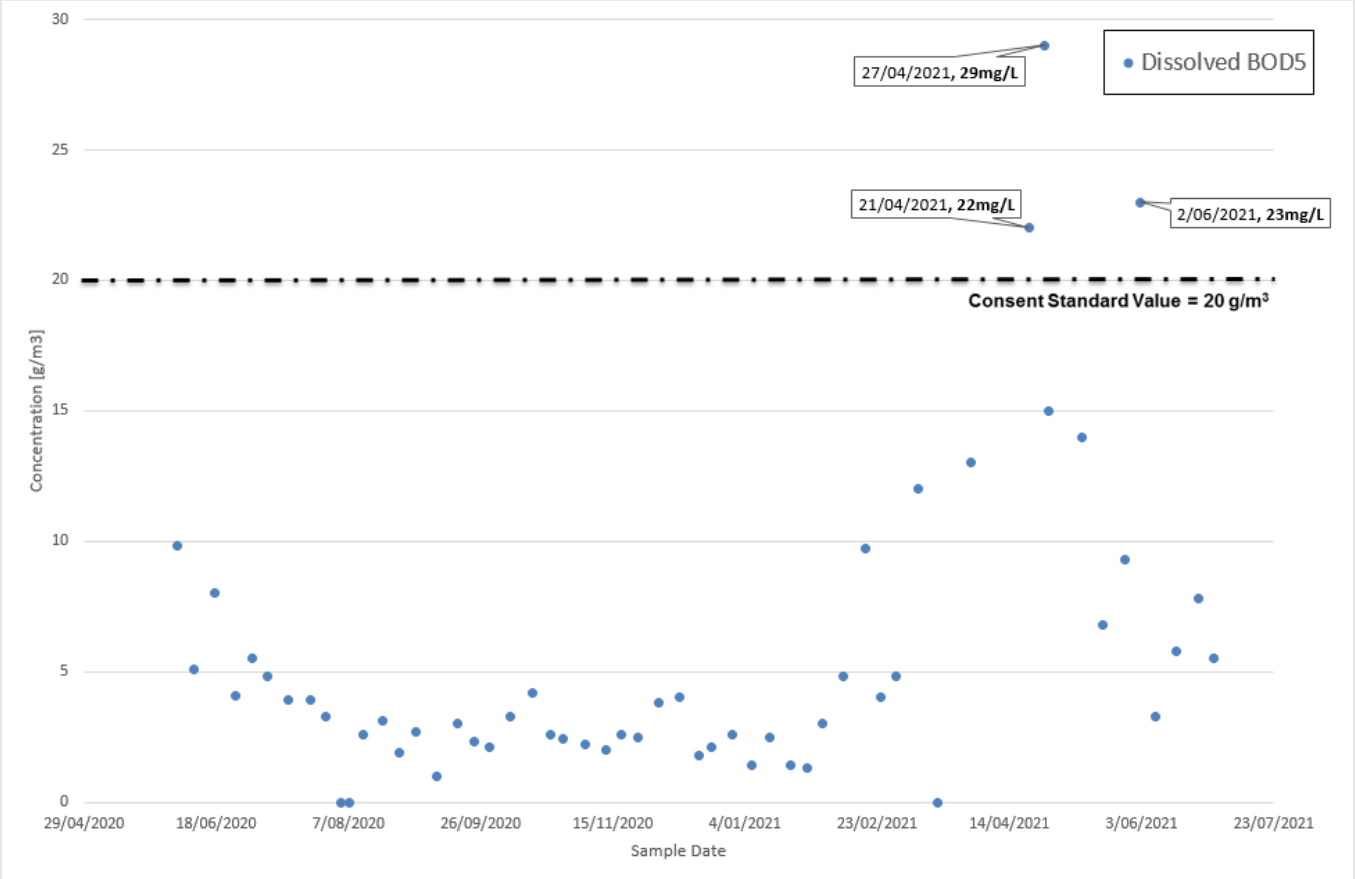
1.5 Dissolved BOD_5 Compliance

Table 1.5.1 Pond Discharge Dissolved BOD_5

Median Value [g/m^3] Current Monitoring Period (July 2020 - June 2021)	3.9	Number of Exceedances Current Monitoring Period (July 2020 - June 2021)	3
Median Value [g/m^3] Previous Monitoring Period (July 2019 - June 2020)	3.2	Number of Exceedances Previous Monitoring Period (July 2019 - June 2020)	0

There were 3 separate occurrences where values exceeded the 20g/m^3 limit recorded for the last year. The median value for the current reporting period was slightly higher at 3.9g/m^3 than the previous period at 3.2 g/m^3.

1.5.2 Pond Discharge Dissolved BOD_5



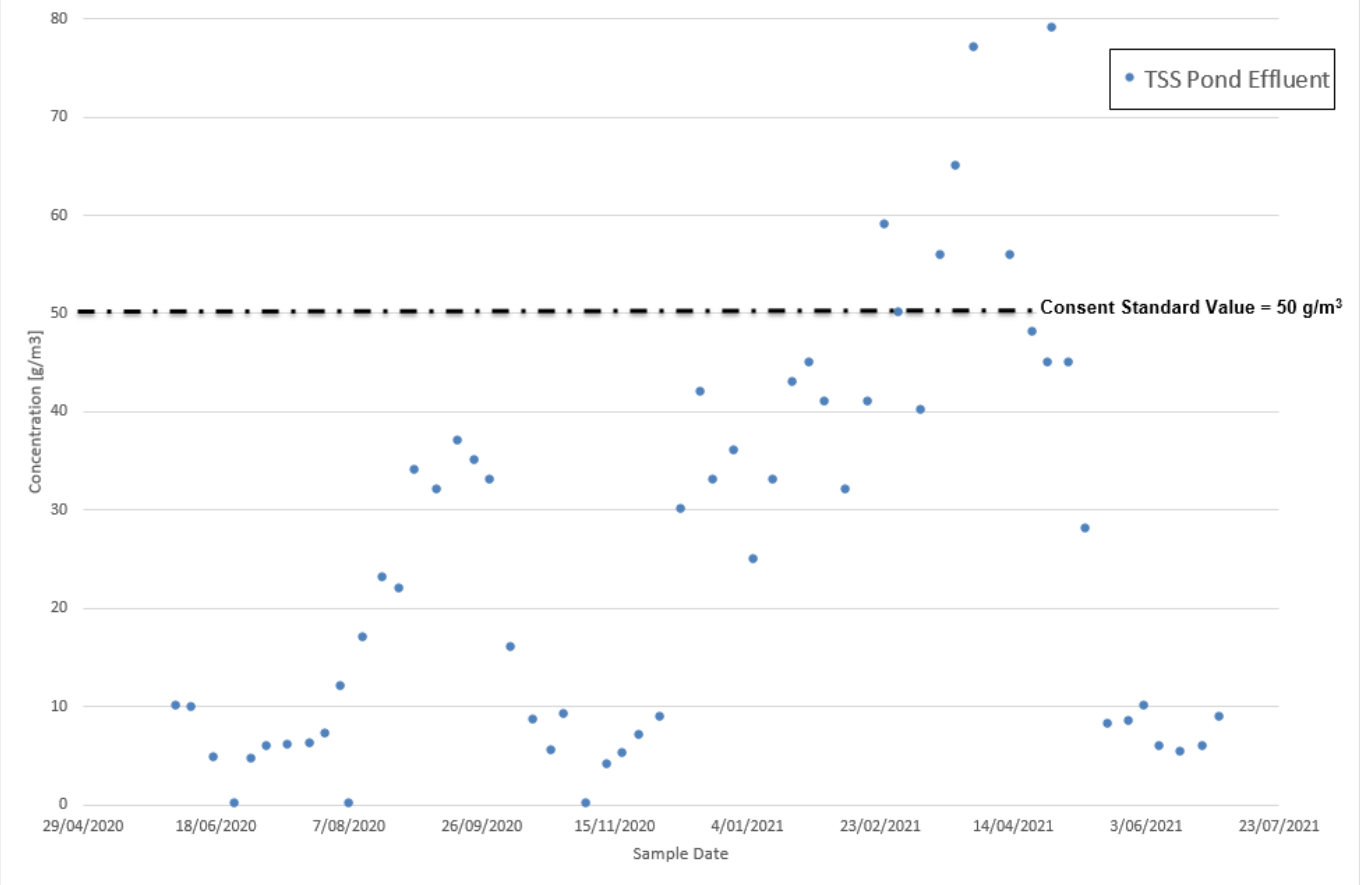
1.6 Total Suspended Solids Compliance

Table 1.6.1 Pond Discharge Total Suspended Solids

Median Value [g/m^3] Current Monitoring Period (July 2020 - June 2021)	25	Number of Exceedances Current Monitoring Period (July 2020 - June 2021)	6
Median Value [g/m^3] Previous Monitoring Period (July 2019 - June 2020)	24	Number of Exceedances Previous Monitoring Period (July 2018 - June 2019)	11

There were 6 occurrences where the 50g/m3 consented limit was exceeded during the last year, this is an improvement on last year where 11 exceedances were recorded. The median value for the current reporting period was slightly higher than the previous period at 25 g/m3

1.6.2 Pond Discharge Total Suspended Solids



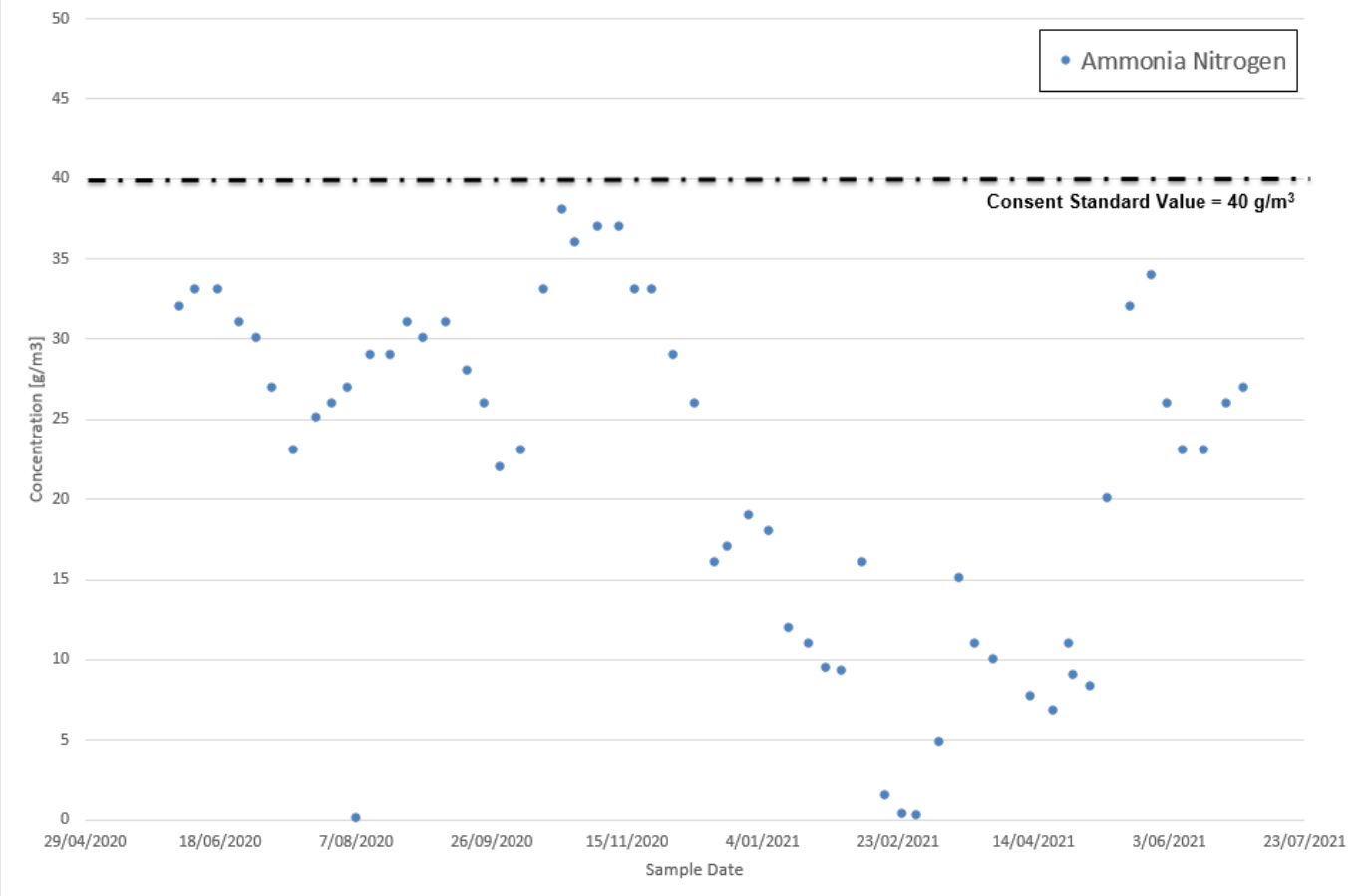
1.7 Ammonia Nitrogen Compliance

Table 1.7.1 Pond Discharge Ammoniacal Nitrogen

Median Value [g/m^3] Current Monitoring Period (July 2020 - June 2021)	26	Number of Exceedances Current Monitoring Period (July 2020 - June 2021)	0
Median Value [g/m^3] Previous Monitoring Period (July 2019 - June 2020)	23	Number of Exceedances Previous Monitoring Period (July 2019 - June 2020)	0

There were no samples taken that exceeded 40g/m3 recorded within the last year. The median value for the current period was slightly higher than the previous reporting period.

1.7.1 Pond Discharge Ammoniacal Nitrogen



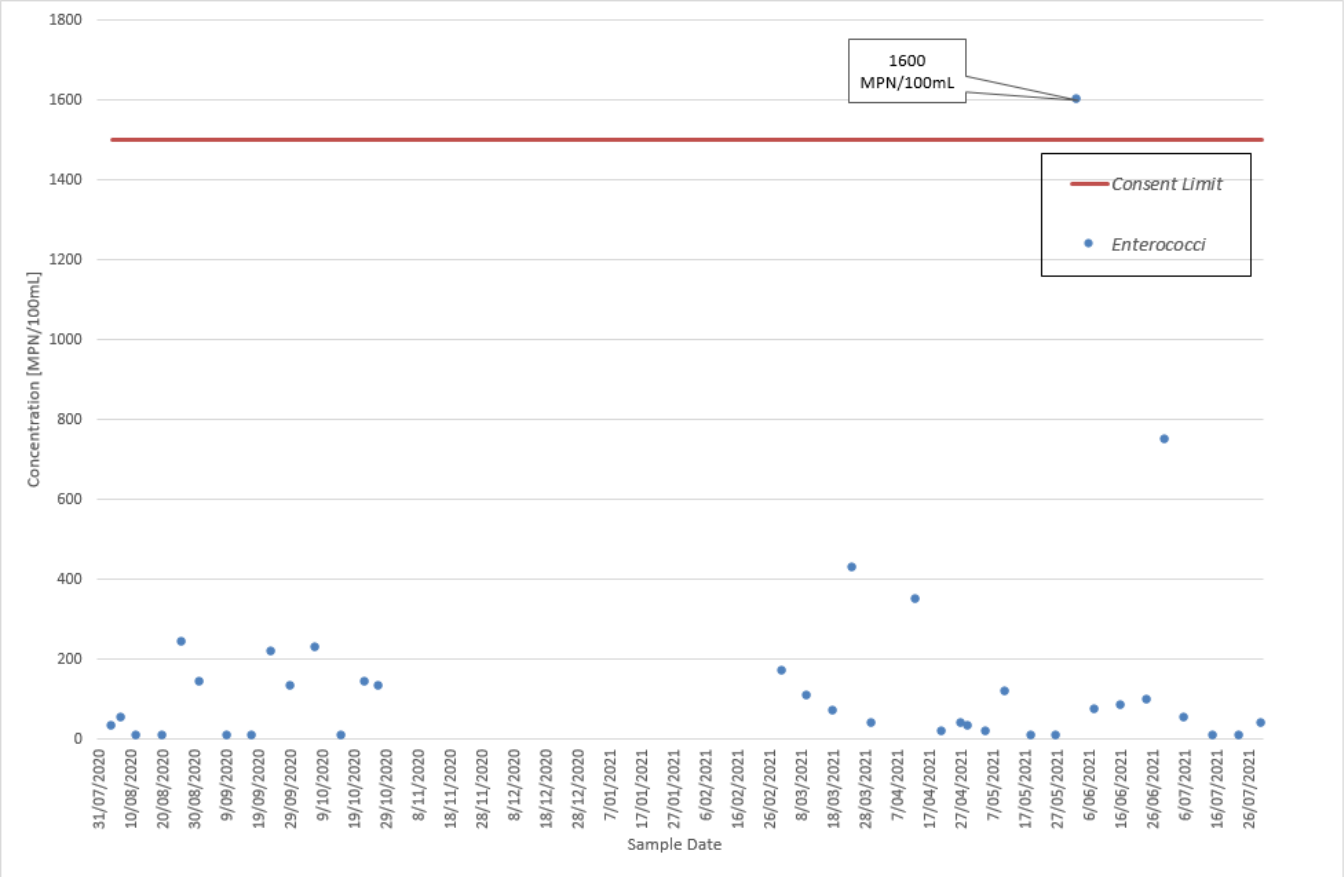
1.8 Enterococci Monitoring

Table 1.8.1 Pond Discharge Enterococci

Median Value [MPN/100ml] Current Monitoring Period (July 2020 - June 2021)	84	Number of Exceedances Current Monitoring Period (July 2020 - June 2021)	1
Median Value [MPN/100ml] Previous Monitoring Period (July 2019 - June 2020)	10	Number of Exceedances Previous Monitoring Period (July 2019 - June 2020)	0

There was one exceedance of the consent limit, 1600 MPN/100mL on 2nd June 2021, this may be attributed to the May 30th-June 1st (1/10yr) storm event where significant additional flow was received into the plant. The median value was significantly higher than the previous period.

1.8.1 Pond Discharge Enterococci



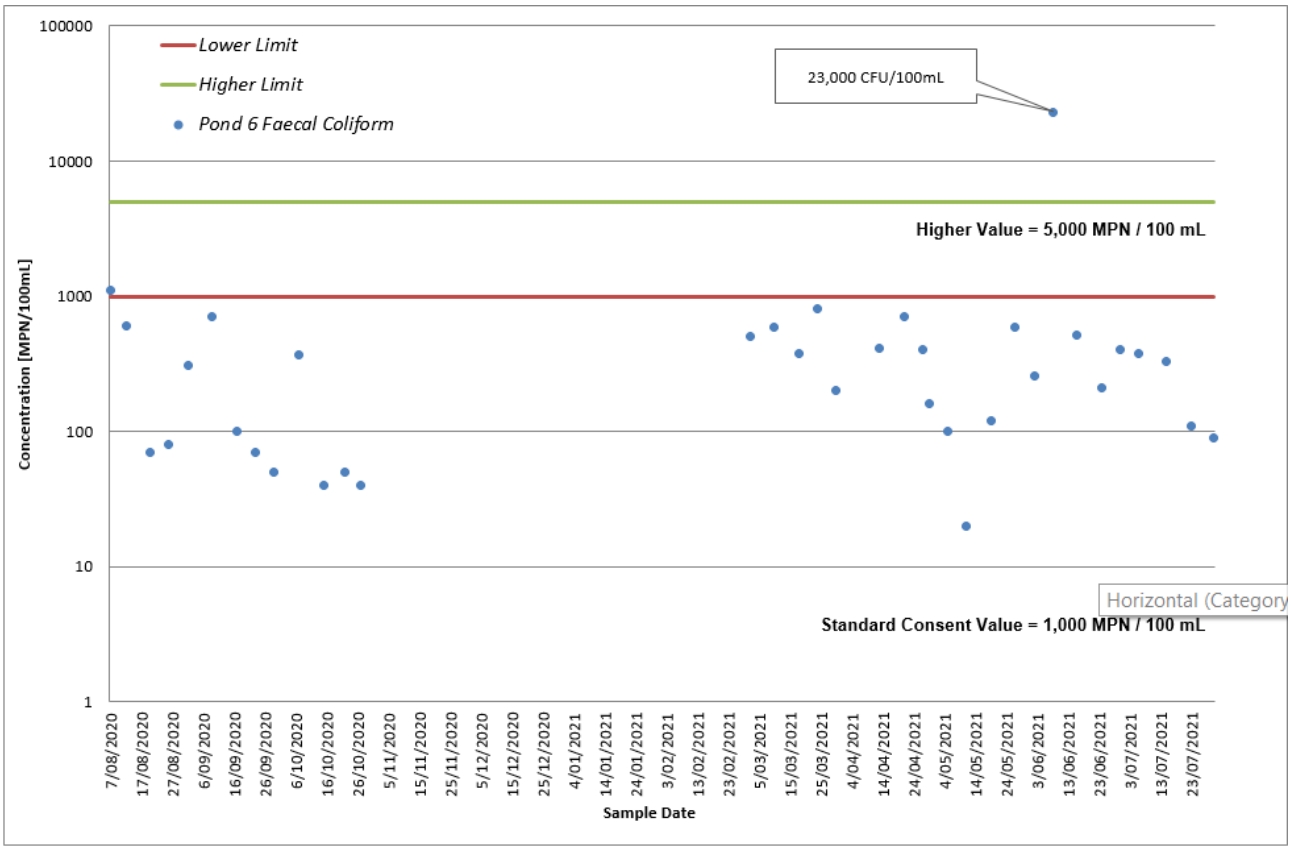
1.9 Faecal Coliform Compliance

Table 0.1 Pond Discharge Faecal Coliforms

Median Value [MPN/100ml] Current Monitoring Period (July 2020 - June 2021)	70	Number of Exceedances of Lower Limit Current Monitoring Period (July 2020 - June 2021)	2
Median Value [MPN/100ml] Previous Monitoring Period (July 2019 - June 2020)	140	Number of Exceedances of Lower Limit Previous Monitoring Period (July 2019 - June 2020)	4

There were two sample results above the standard consent limit, with one of those above the higher consent limit, this value may be attributed to the 1/10yr storm event ending 1st June 2021. The median for this year is half than that of the previous period.

0.1 Pond Discharge Faecal Coliforms



Other Pathogenic, and Other Contaminants

Condition 13e

Giardia cysts, cryptosporidium, salmonella, enterovirus, adenovirus and campylobacter levels have been measured and reported in March 2020 and are therefore contained in the 2019-2020 annual monitoring report.

Condition 13f

Heavy metals (copper, chromium, nickel, zinc, cadmium, lead, arsenic, and mercury) were measured and reported October 2020 and January, April & July for 2021. Results are attached in the appendices

Condition 13g

Organochlorine pesticides, organophosphate pesticides, PCBs, and polycyclic aromatic hydrocarbons were last analysed in September 2019 and reported in the February 2020 quarterly report.

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 2019 – June 2020

Consent Condition	Parameter	Compliance Condition	Compliance				
			Jul - Oct 20	Nov –Jan 21	Feb – Apr 21	May - Jun 21	Overall
18	Faecal Coliforms	Sampled and Analysed	☺	☺	☺	😐	☺
	Enterococci	Sampled and Analysed	☺	☺	☺	😐	☺
22a[1]	Temperature	Two yearly	☺	☺	☺	☺	☺
	DO	Two yearly	☺	☺	☺	☺	☺
	Salinity	Two yearly	☺	☺	☺	☺	☺
	Total Suspended Solids	Two yearly	☺	☺	☺	☺	☺
	Nitrogen Oxides	Two yearly	☺	☺	☺	☺	☺
	Ammoniacal Nitrogen	Two yearly	☺	☺	☺	☺	☺
	Dissolved Reactive Phosphorus	Two yearly	☺	☺	☺	☺	☺
	Chlorophyll-a	Two yearly	☺	☺	☺	☺	☺
	Trace Metals (arsenic, cadmium, copper, chromium, lead, nickel and zinc)	Two yearly	☺	☺	☺	☺	☺
	Faecal Coliforms	Two yearly	☺	☺	☺	☺	☺
	Enterococci	Two yearly	☺	☺	☺	☺	☺
	Phytoplankton Species	Two yearly	☺	☺	☺	☺	☺

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

[1] Sampling undertaken 2021 results in attached spreadsheet.

2.2 *Comments on Compliance*

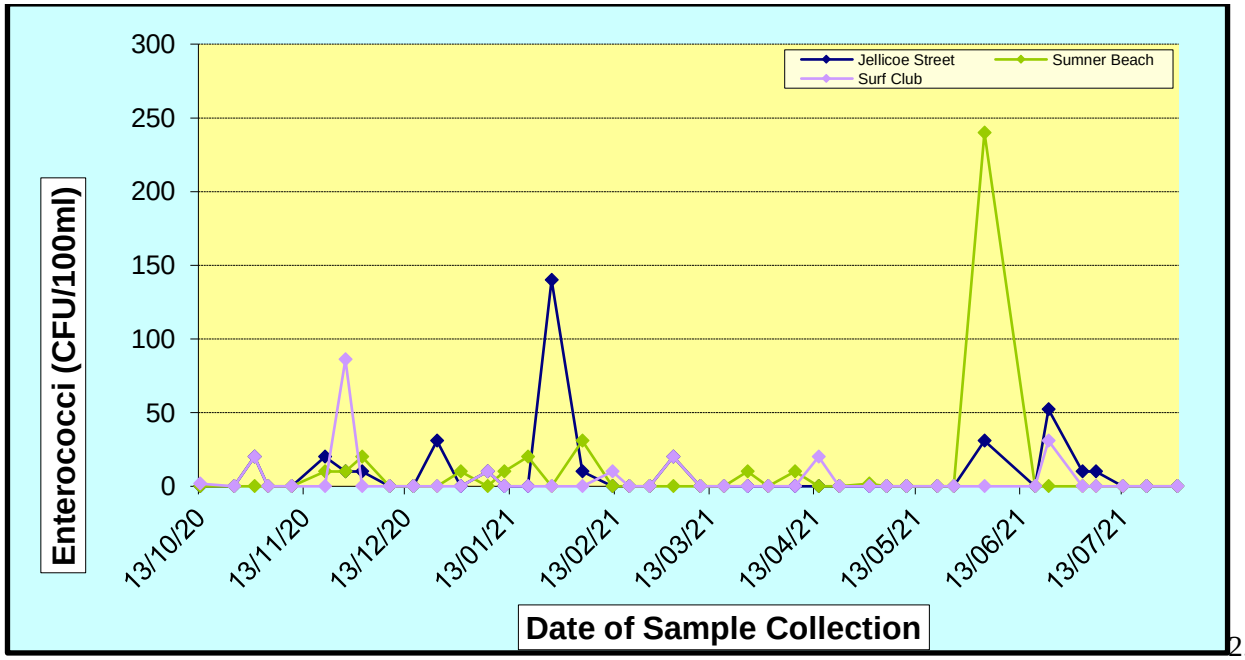
Most results for the Pegasus Bay area for e.coli and Enterococci are within the consented limits. On 4 occasions follow-up sampling was required. No follow-up sample returned a result above the consented limit.

Testing for condition 22a (biannual requirement) was undertaken and results submitted to ECan. The next round of sampling will be in 2023

2.3 *Beach Water Quality Analysis Results*

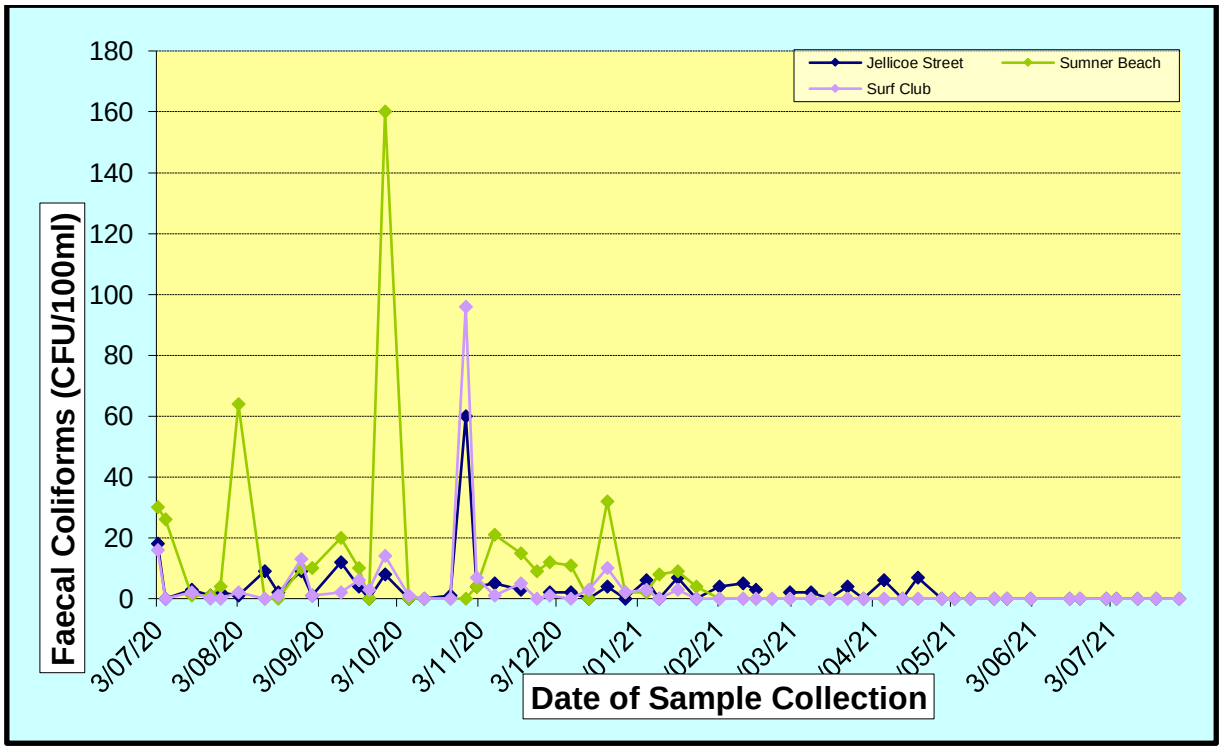
Samples for condition 18 were taken at weekly intervals from the prescribed onshore locations. The results are presented in Figures 2.3.1and 2.3.2. Retest results are contained in the appendices.

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 2020 - Jun 2021

Consent Condition	Parameter	Frequency	Compliance Condition	Compliance				
				Jul - Oct 19	Nov –Jan 20	Feb – Apr 20	May - Jun 20	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 – done March 2012 - 12/140121	n/a	n/a	n/a	n/a	n/a
36	Community Liaison Group	Annually	Not requested in 2019 (as per ECAN agreement)	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 was undertaken in March 2018. Next due in February/March 2022.

Condition 27

Shellfish were sampled and analysed 18th September and December 16th 2020

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 36

Environment Canterbury agreed that due to negligible interest in our community meeting that we could forgo holding it unless requested by the community. There was no request in 2019. The annual report it still to be circulated.