

Annual Report

Ocean Outfall, CRC051724 CWTP

1 July 2023 – 30 June 2024

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Introduction

This report summarises the results of parameters monitored by the Christchurch Wastewater Treatment Plant (CWTP) Ocean Outfall over the period 1 July 2023 – 30 June 2024, in accordance with consent **CRC051724**. This consent authorises the discharge of treated wastewater from the CWTP Oxidation Ponds into the Pegasus Bay Coastal Marine Area via an ocean outfall.

At the CWTP we are still managing effects stemming from the fire which broke out on the 1st of November 2021, on the roof of the two trickling filters at the CWTP, where it burned for 24 days before being extinguished.

The trickling filters were a key component of the secondary treatment process at the CWTP, where they had been in operation since early 1978, responsible for removing around 60% of the organic matter from the sewage inflow. The plastic filter media provided an ideal environment for bacterial slime to grow and as it grew, it consumed the nutrients in the wastewater. As more flow was pumped into the trickling filters, excess slime was washed off as a floating solid and resulted in removal of up to 95% of BOD and ammonia.

Water quality has deteriorated since the catastrophic loss of the fire. The activated sludge plant recovered most of the secondary treatment efficiency previously provided by the trickling filters. The quality of the wastewater being discharged to the oxidation ponds is now much improved and ensures that going forwards, we can comply with the water standards outlined by the outfall consent.

1. Discharge rate and maintenance

1.1 Resource Consent Conditions

Table Error! No text of specified style in document..1 Pond Discharge Consent Compliance for Monitoring Period 1 July 2023 – 30 June 2024

Consent Condition	Parameter	Condition Detail	Condition Timeframe	Comments	Overall
2	Discharge Content	Discharge is only wastewater from the CWTP ponds	Continuous	Discharge is all and only from the CWTP ponds	😊
3	Discharge Volume	Recorded	Continuous	See figures 1.2.1 and 1.2.2	😊
4	Discharge Rate	Recorded	Continuous	See figures 1.2.1 and 1.2.2	😊
9	Outfall Maintenance	Routine maintenance of the discharge system completed and recorded	Continuous	Discharge system is the pump station, pipeline and diffuser outlets	😊
10	Outfall Condition	Visual inspection of outfall	Five yearly	Completed in March 2021, next due in 2026	😊
12	Pumping Pressure for a given flow	Monitored at the pump station	Continuous	See figure 1.2.3	😊

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 is now operating within expected parameters. There was a slight build-up of sand in the outfall pipe, but no significant leaks or blockages. Flushing has been carried out and this has brought the hydraulic curve back within usual operating pressure. See figures 1.2.3 and 1.2.4.

Figure Error! No text of specified style in document..1 - Daily Outfall Flow Totals 1 Jul 2023 – 30 Jun 2024

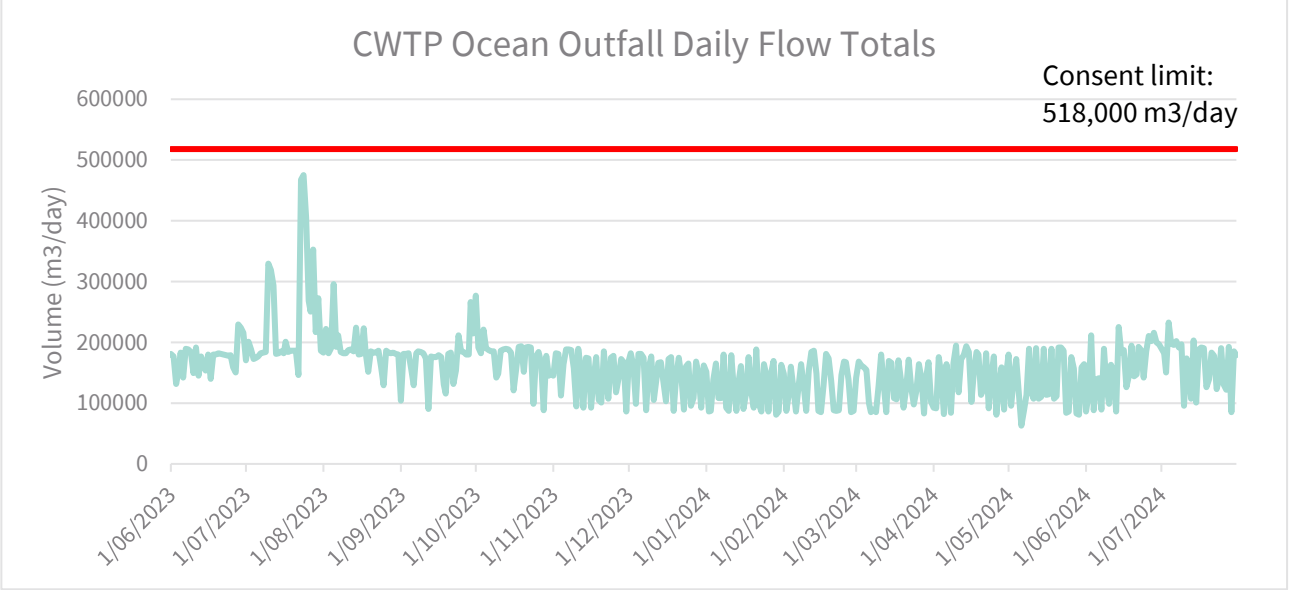


Figure Error! No text of specified style in document..2 - Daily Peak Outfall Flows 1 Jul 2023 - 30 Jun 2024

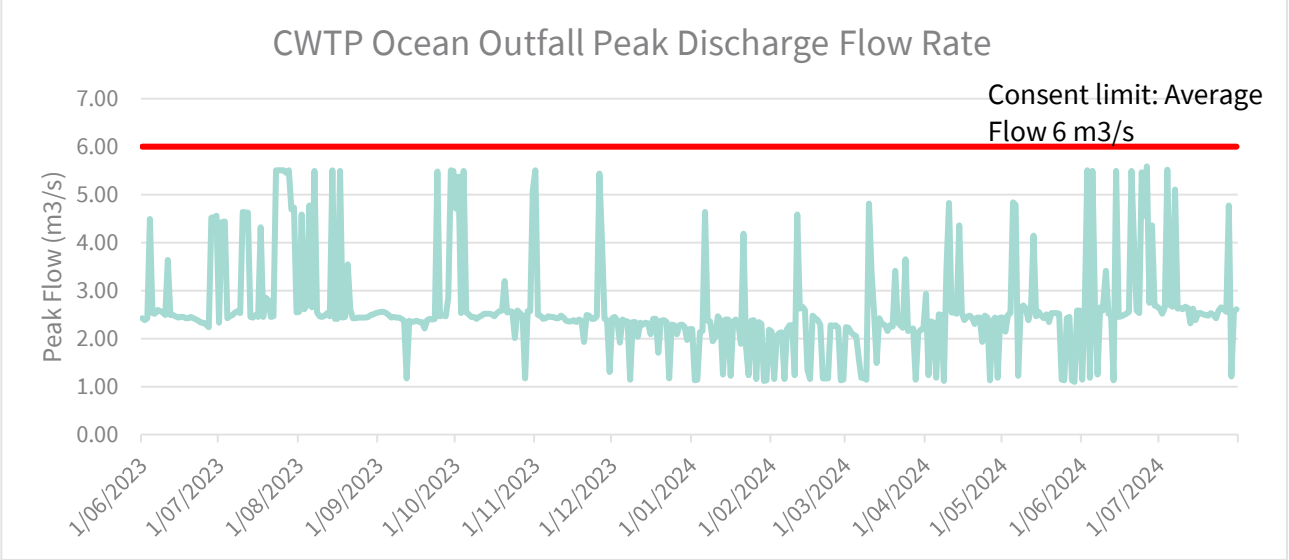


Figure Error! No text of specified style in document..3 – October 2023 Hydraulic Pressure Test Curve

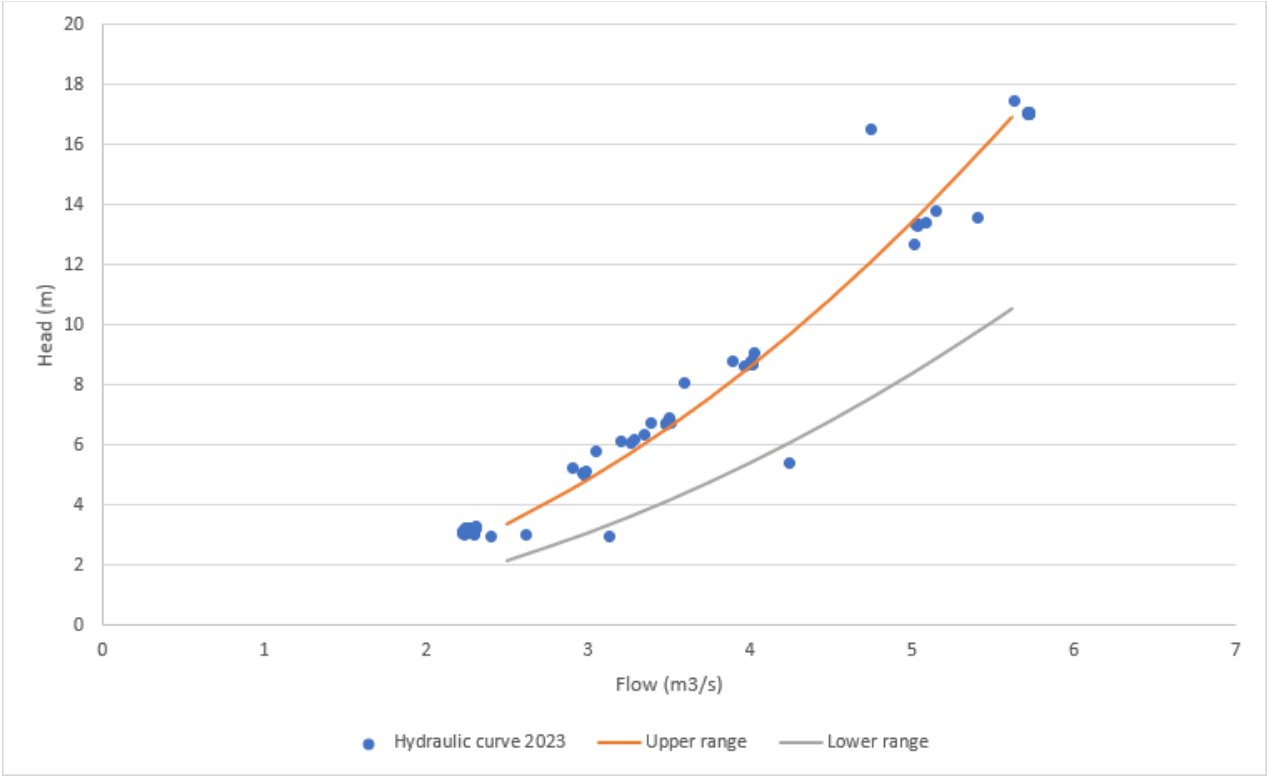
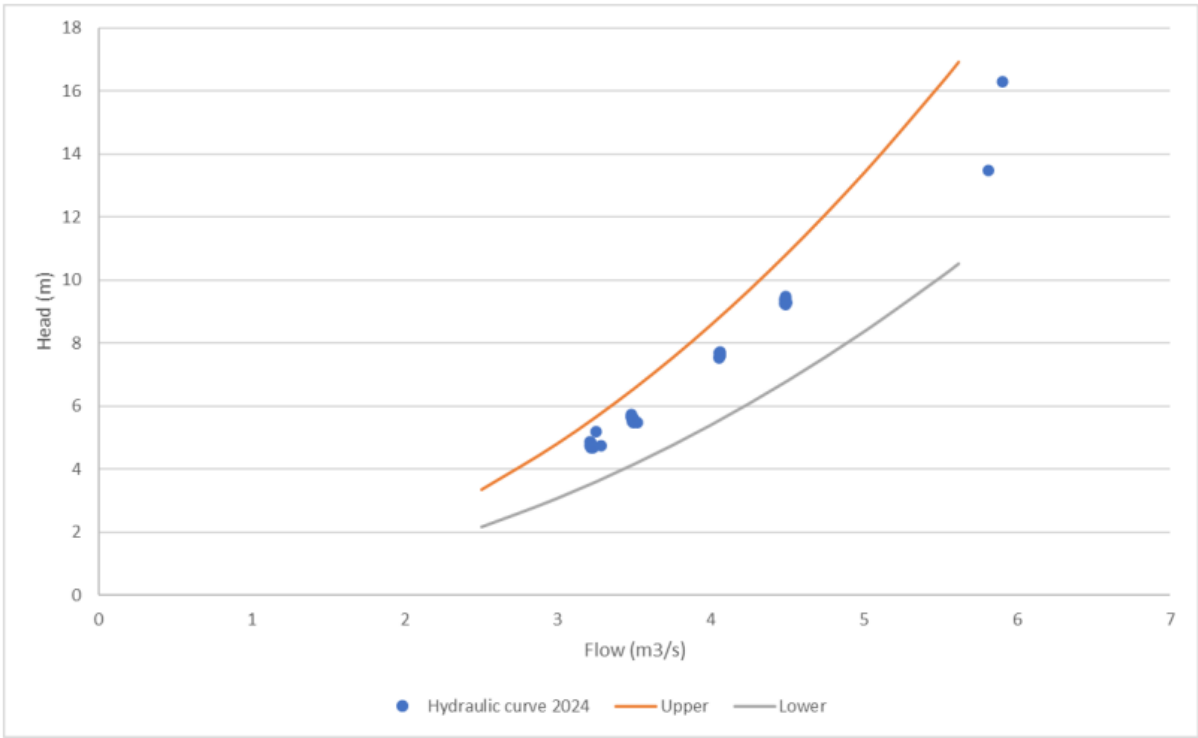


Figure Error! No text of specified style in document..4 – June 2024 Hydraulic Pressure Test Curve



1.3 Resource Consent Standard Conditions

Table Error! No text of specified style in document..2 Contaminant Limits Consent Compliance 1 July 2023 – 30 June 2024 CRC051724

Consent Condition	Parameter	Condition Description	Ju l- 23	Au g- 23	Se p- 23	Oc t- 23	No v- 23	De c- 23	Ja n- 24	Fe b- 24	Ma r- 24	Ap r- 24	Ma y- 24	Ju n- 24	Over all
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

1.3.2 Comments on Resource Consent Standard Conditions

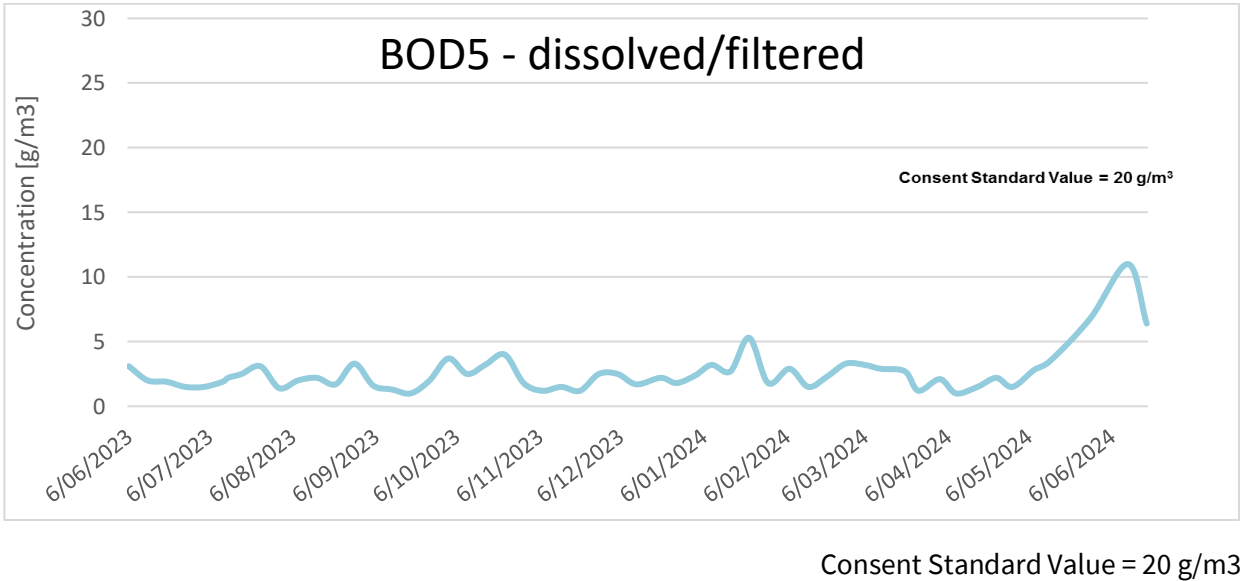
Water quality deteriorated after the catastrophic loss of the two trickling filters in the fire of November 2021. In August 2022 a temporary activated sludge plant was brought online and this had a positive effect on the water quality standard.

1.4 Dissolved BOD5 Compliance

Table 1.4.1 Ocean Outfall Discharge Dissolved BOD₅

Median Value [g/m ³] Current Monitoring Period (July 2023 - June 2024)	2.2	Number of Exceedances Current Monitoring Period (July 2023 - June 2024)	0
Median Value [g/m ³] Previous Monitoring Period (July 2022 - June 2023)	9.65	Number of Exceedances Previous Monitoring Period (July 2022 - June 2023)	2

1.4.3 Ocean Outfall Discharge - Dissolved BOD₅



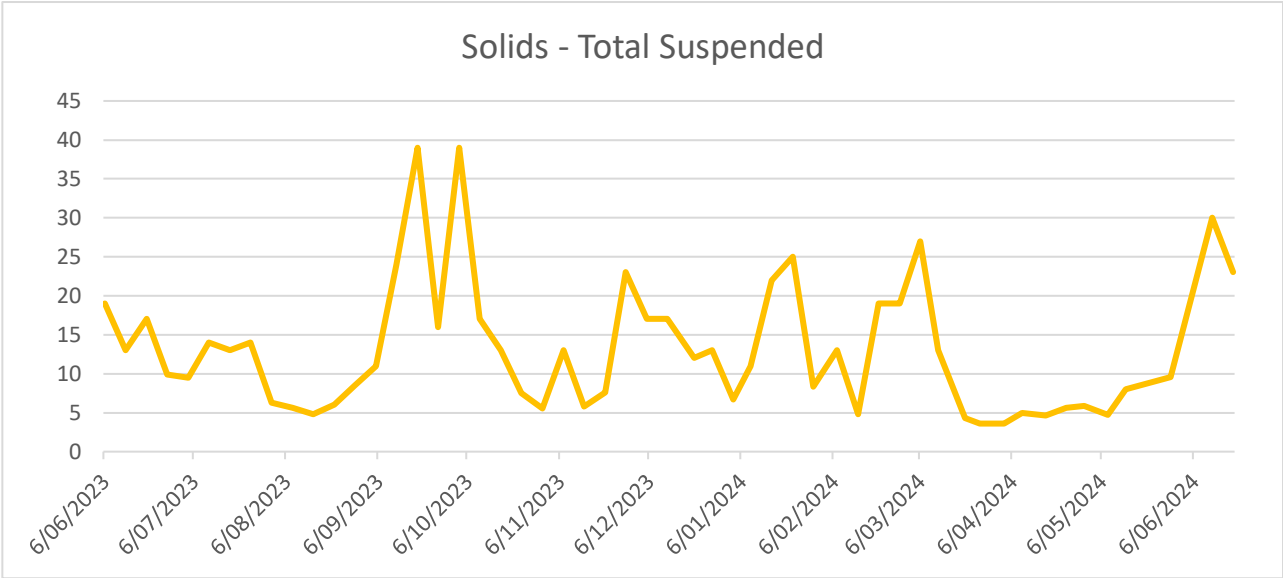
1.5 Total Suspended Solids Compliance

Table 1.5.4 Ocean Outfall Discharge Total Suspended Solids

Median Value [g/m ³] Current Monitoring Period (July 2023 - June 2024)	12.5	Number of Exceedances Current Monitoring Period (July 2023 - June 2024)	0
Median Value [g/m ³] Previous Monitoring Period (July 2022 – June 2023)	18	Number of Exceedances Previous Monitoring Period (July 2022 – June 2023)	6

There were 0 values exceeding the 50g/m3 limit recorded for the current year. The median value for the current reporting period was lower than the previous period.

Error! No text of specified style in document.5.5 Ocean Outfall Discharge Total Suspended Solids



Immediately following the fire, high TSS levels were reported. This was due to partially untreated wastewater (primary treated only) being discharged rapidly through the oxidation ponds, which didn't provide sufficient settlement time. With the implementation of the temporary process, the settlement time has now been increased, which has returned the TSS levels to below the consent standard level of 50 g/m3.

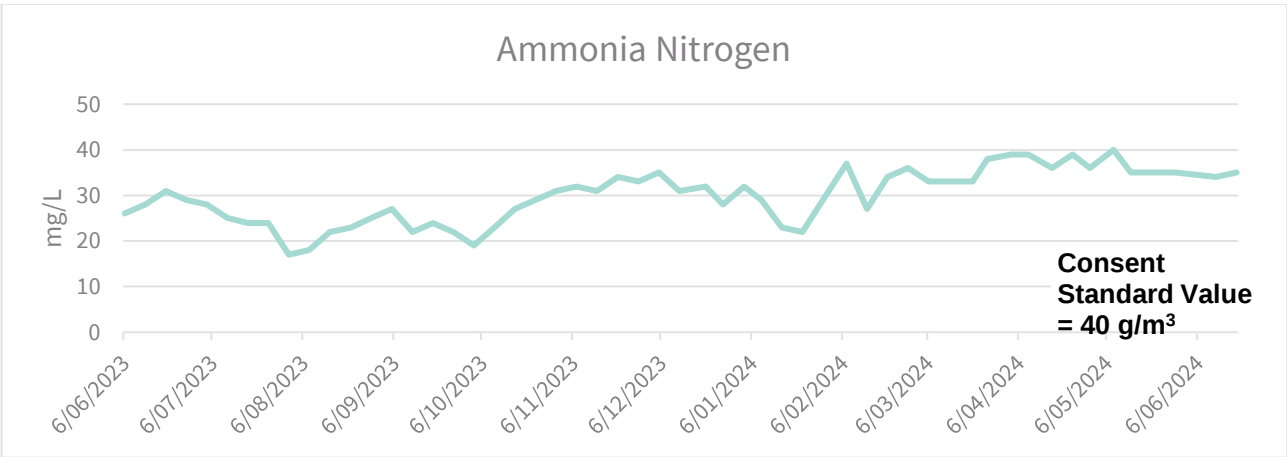
1.6 Ammonia Nitrogen Compliance

Table 1.6.6 Ocean Outfall Discharge Ammoniacal Nitrogen

Median Value [g/m ³] Current Monitoring Period (July 2022 - June 2023)	30	Number of Exceedances Current Monitoring Period (July 2023 - June 2024)	0
Median Value [g/m ³] Previous Monitoring Period (July 2022 - June 2023)	24	Number of Exceedances Previous Monitoring Period (July 2022 - June 2023)	0

There was zero values exceeding 40g/m3 recorded for current year. The median value for the current period was slightly higher than the previous reporting period.

1.6.2 Ocean Outfall Discharge Ammoniacal Nitrogen



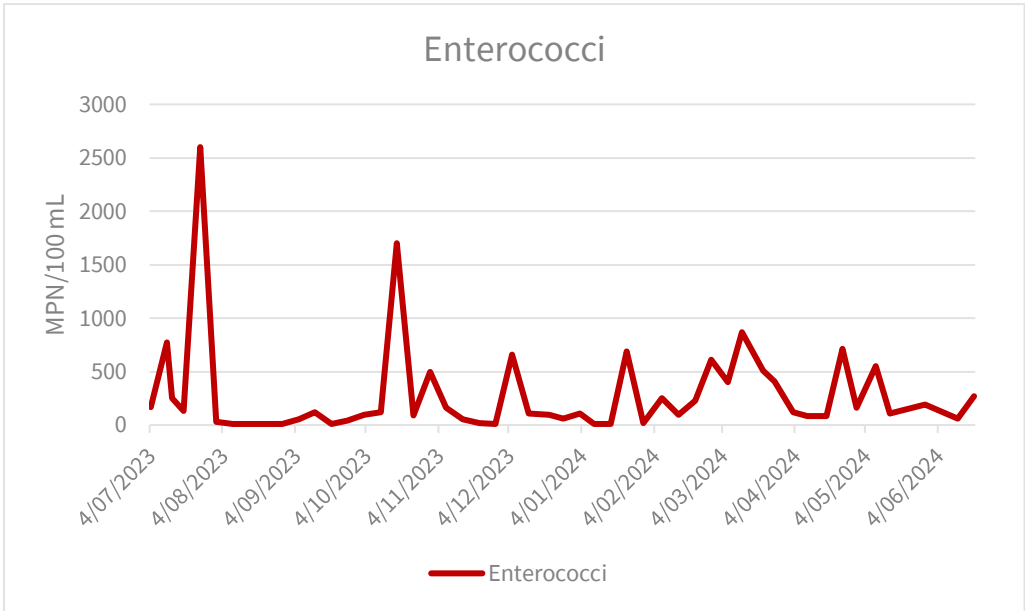
1.7 Enterococci Monitoring

Table 1.7.7 Ocean Outfall Discharge Enterococci

Median Value [MPN/100ml] Current Monitoring Period (July 2023 - June 2024)	110	Number of Exceedances Current Monitoring Period (July 2023 - June 2024)	2
Median Value [MPN/100ml] Previous Monitoring Period (July 2022 - June 2023)	210	Number of Exceedances Previous Monitoring Period (July 2022 - June 2023)	12

There were 2 exceedances of the standard consent value (1,500 MPN/100mL) in the current year.

Error! No text of specified style in document..3 Ocean Outfall Discharge Enterococci



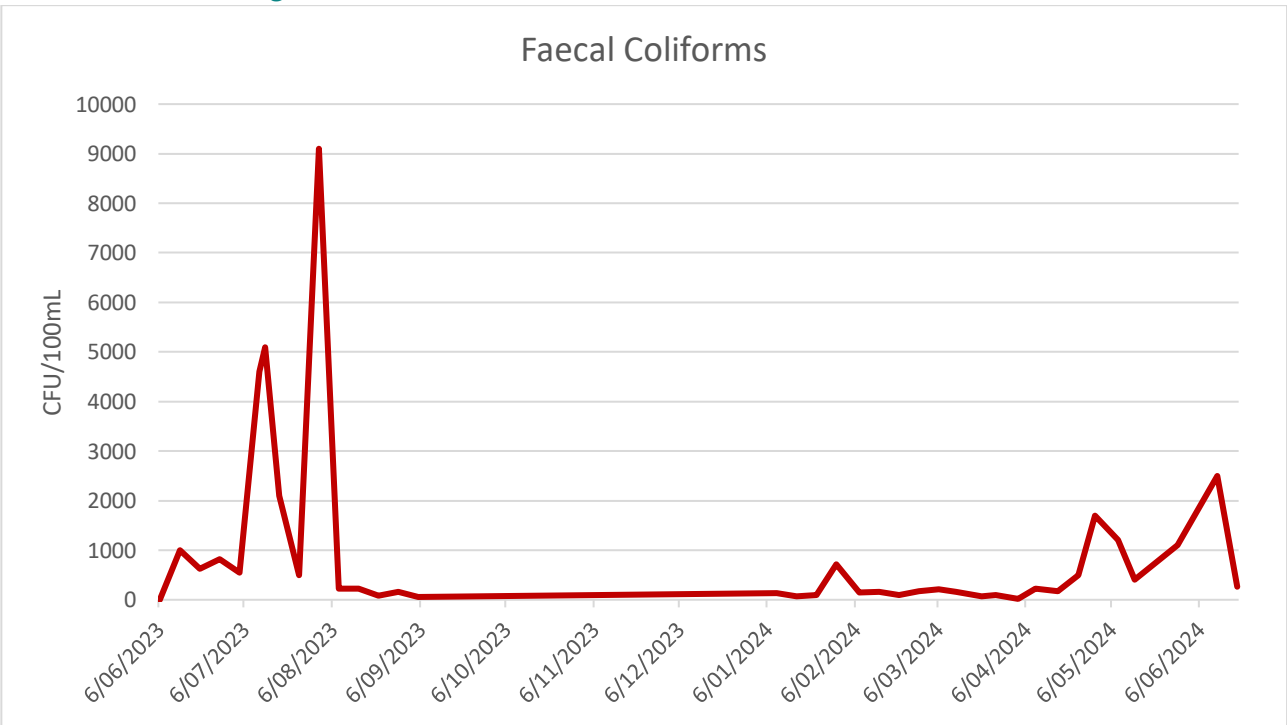
1.8 Faecal Coliform Compliance

Table 1.8.8 Ocean Outfall Discharge Faecal Coliforms

Median Value [MPN/100ml] Current Monitoring Period (July 2023 - June 2024)	170	Number of Exceedances Current Monitoring Period (July 2023 - June 2024)	9
Median Value [MPN/100ml] Previous Monitoring Period (July 2022 - June 2023)	335	Number of Exceedances Previous Monitoring Period (July 2022 - June 2023)	13

There were 9 sample results above the standard consent limit of 1000CFU/100mL, with 2 of those also above the higher consent limit of 5000CFU/100mL. The median for this year is lower than the previous period.

1.8.2 Ocean Outfall Discharge Faecal Coliforms



1.9 Other Pathogenic and Other Contaminants

These results have been attached to this annual report and have also been included in the monitoring reports sent quarterly.

Condition 13e – Annual Pathogen Monitoring of Ocean Outfall

	Enterovirus Ox Ponds	Adenovirus Ox Ponds	Giardia Ox ponds	Cryptosporidium Ox ponds	Salmonella Ox ponds	Thermotolerant Campylobacter Ox ponds
Unit	pfu10/L	IU/10 L	confirmed cysts/L	confirmed oocysts/L	MPN/100ml	MPN/100ml
17/3/2020	170	4200	6	<0.67	0.9	<0.30
17/4/2023	0	80	<0.67	<0.67	<0.3	0.4
1/5/2024	0	5	<0.67	0.67	<0.3	43

Condition 13f – Six monthly heavy metal monitoring of Ocean Outfall

Date	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Mercury
Unit	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3
9/04/2024	0.0016	<0.001	0.0017	<0.001	<0.001	0.0022	0.0044	
9/01/2024	0.0021	<0.001	0.0033	0.002	<0.001	0.0018	0.0084	
2/10/2023	0.0031	<0.001	0.019	0.015	0.0042	0.0063	0.062	
20/07/2023	0.0026	<0.001	0.0051	0.0034	<0.001	0.002	0.017	<0.00005

Condition 13g – Annual Organochlorine pesticides, organophosphate pesticides, PCBs, and polycyclic aromatic hydrocarbons

- Sampled on 6/8/2024

See attached pdf for the full results.

2. Receiving Environment Monitoring in Pegasus Bay

2.1 Water Quality Resource Consent Conditions

Consent conditions 18, 21 and 22 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 2.3.2. The results are attached to the quarterly reports covering the same period.

Table Error! No text of specified style in document..1 Weekly Sampling Beach Water Quality Compliance July 2023 – June 2022

Consent Condition	Location	Parameter	Jul - Oct 23	Nov – Jan 24	Feb – Apr 24	May - Jun 24	Overall
18	South New Brighton Beach	Faecal Coliforms	☹️	☹️	☹️	☹️	☹️
18	South New Brighton Beach	Enterococci	😊	☹️	😊	😊	😊
18	Sumner Beach Surf Club	Faecal Coliforms	☹️	😊	😊	😊	😊
18	Sumner Beach Surf Club	Enterococci	😊	😊	😊	😊	😊
18	New Brighton Beach Surf Club	Faecal Coliforms	☹️	☹️	☹️	☹️	☹️
18	New Brighton Beach Surf Club	Enterococci	☹️	😊	😊	😊	😊

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

Table Error! No text of specified style in document..2 Weekly Sampling Beach Water Quality Compliance July 2023 – June 2022

Consent Condition	Location	Parameter	Jul - Oct 23	Nov – Jan 24	Feb – Apr 24	May - Jun 24	Overall
20	South New Brighton Beach	Faecal Coliforms	😊	😊	😊	😊	😊
19	South New Brighton Beach	Enterococci	😊	😊	😊	😊	😊
20	Sumner Beach Surf Club	Faecal Coliforms	😊	😊	😊	😊	😊
19	Sumner Beach Surf Club	Enterococci	😊	😊	😊	😊	😊
20	New Brighton Beach Surf Club	Faecal Coliforms	😊	😊	😊	😊	😊
19	New Brighton Beach Surf Club	Enterococci	😊	😊	😊	😊	😊

Table Error! No text of specified style in document..3 Receiving Environment Ocean Water Quality Compliance July 2023 – June 2024

Consent Condition	Parameter	Condition Timeframe	North of the centre	South of the centre	West of inshore end	East of inshore end	Overall
22a (last sampled 6/3/2023, next due in 2025)	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: 😊 Good, 😐 Fair, 🟡 Fair with caution, 🟠 Fair with concern, 🔴 Poor

2.2 Beach Water Quality Analysis Results

Samples for condition 18 were taken at weekly intervals from the prescribed onshore locations. The results are presented below. The limit for Enterococci is 280/100mL and Faecal Coliforms 43CFU /100mL. The below table describes the notification requirements for any exceedances detected.

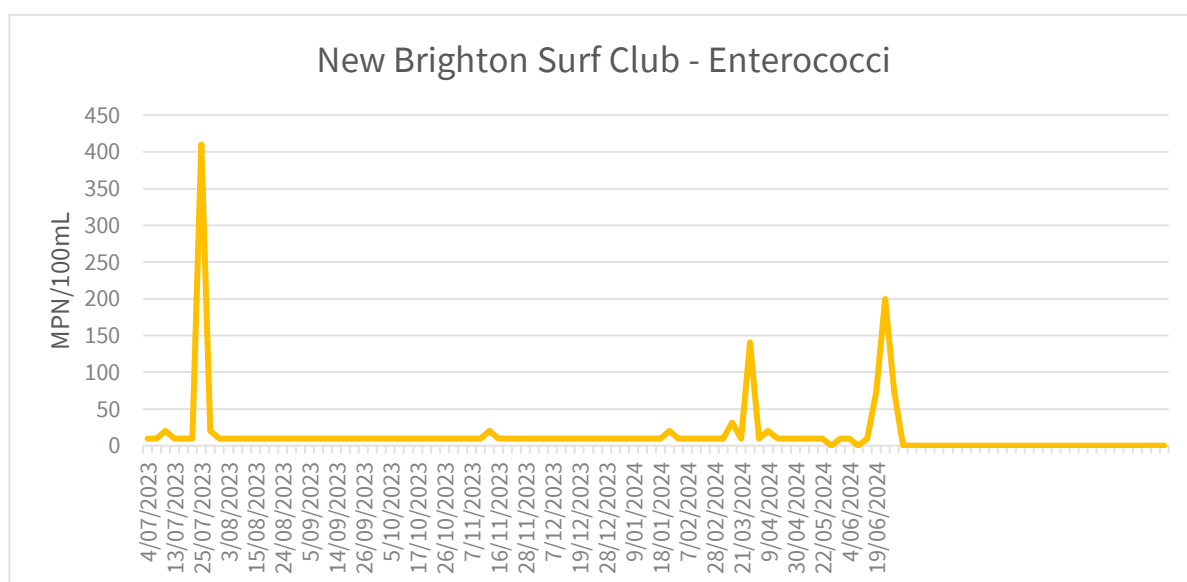
Condition 19 of CRC051724

In the event that the concentration of enterococci in a single sample collected from a site identified in condition 18(a) exceeds 280 enterococci per 100 millilitres, the consent holder shall within 24 hours collect another sample from that site. If the **second sample** also exceeds 280 enterococci per 100 millilitres, the consent holder shall notify the Canterbury Regional Council and the Medical Officer of Health for Canterbury within 48 hours of detection of this exceedance.

Condition 20 of CRC051724

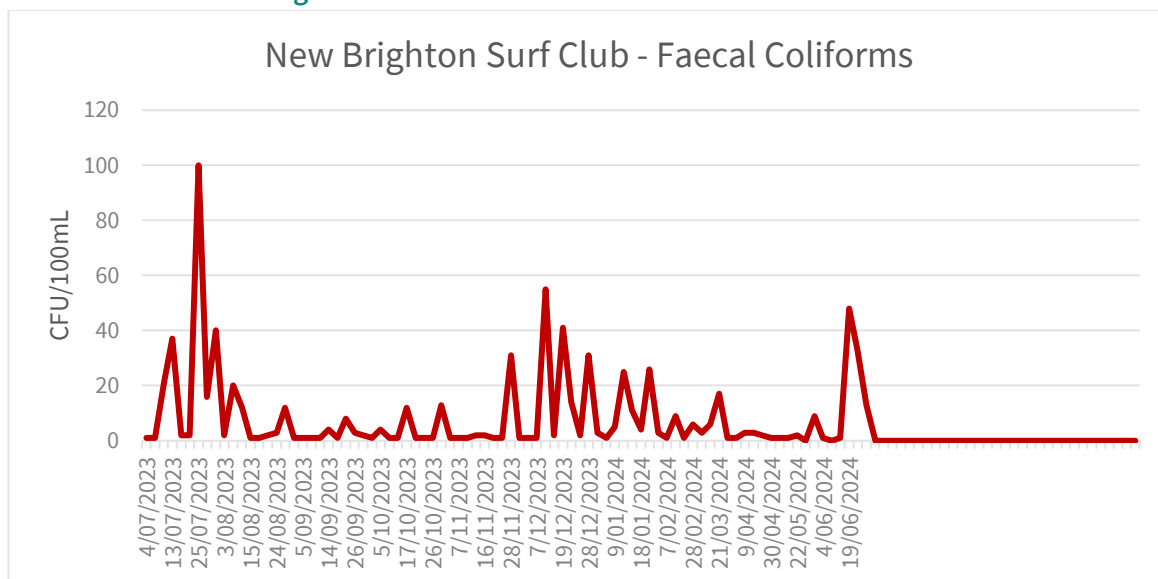
In the event that the concentration of faecal coliforms in a single sample collected from a site identified in condition 18(a) exceeds 43 faecal coliforms per 100 millilitres at a site, the consent holder shall within 24 hours collect another sample from that site. If the **second sample** from that site exceeds 43 faecal coliforms per 100 millilitres, the consent holder shall notify the Canterbury Regional Council and the Medical Officer of Health for Canterbury within 48 hours of detection of this exceedance.

2.2.1 Enterococci Levels at New Brighton Surf Club



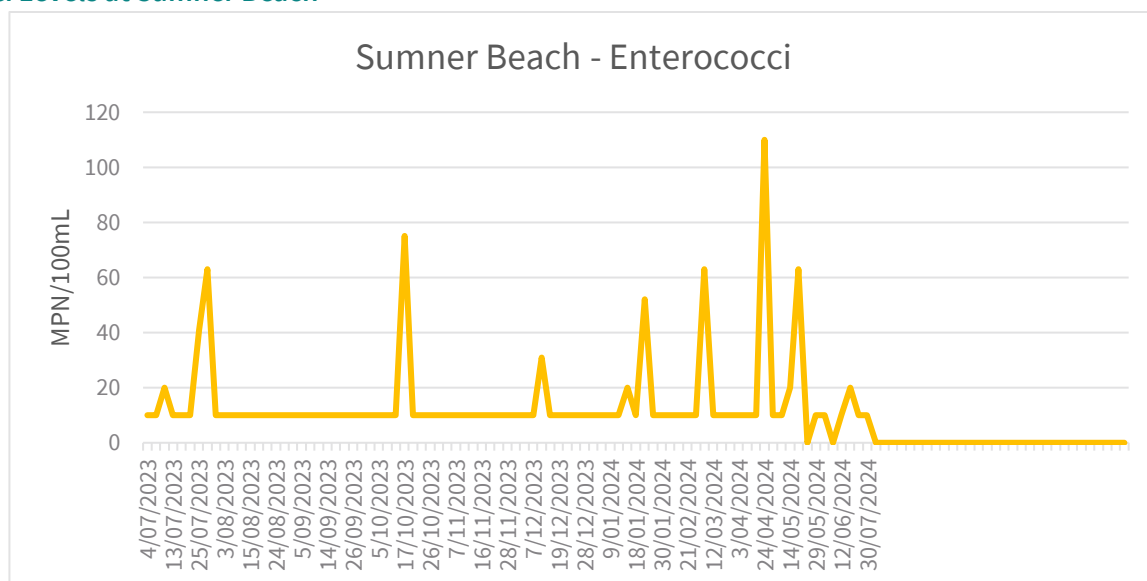
There was 1 exceedance of the 280MPN/100 mL Enterococci consent limit at New Brighton Surf Club this reporting period, with a sample result of 410MPN/100 mL returned on 25/07/2023. The beach was resampled within 48rs on 27/07/2023 and a sample result of 20 MPN/100 mL was returned, which was below the consent limit.

2.2.2 Faecal Coliform Levels at New Brighton Surf Club



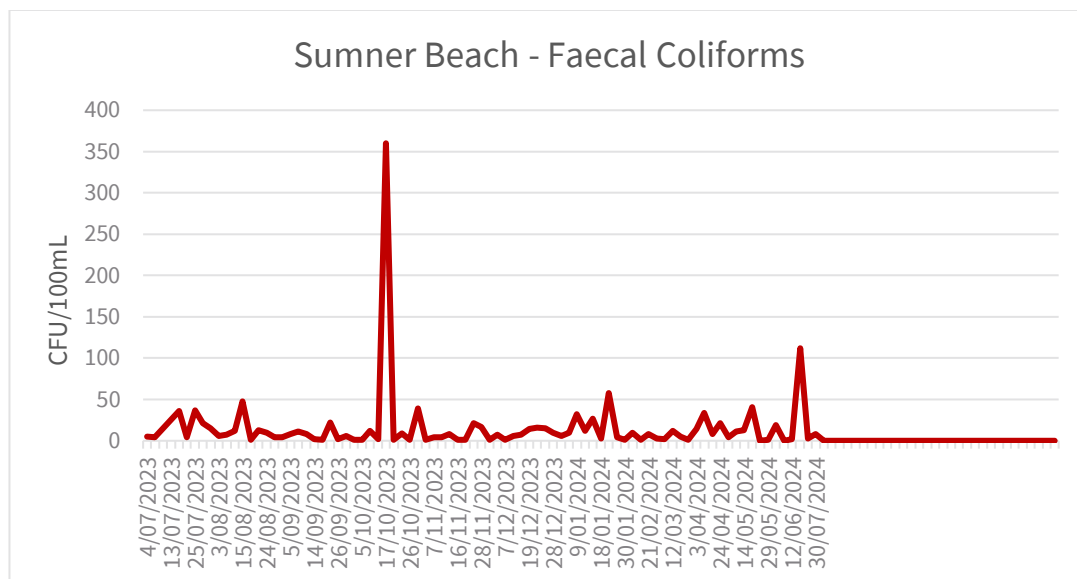
There were 3 exceedances of the 43CFU/100 mL Faecal Coliform consent limit at New Brighton Surf Club this reporting period, with sample results of 100CFU/100 mL returned on 25/07/2023, 55CFU/100 mL on 12/12/2023 and 48CFU/100 mL on 19/06/2024. The beach was resampled within 48hrs on each occasion, and a compliant sample result below the consent limit was returned.

2.2.3 Enterococci Levels at Sumner Beach



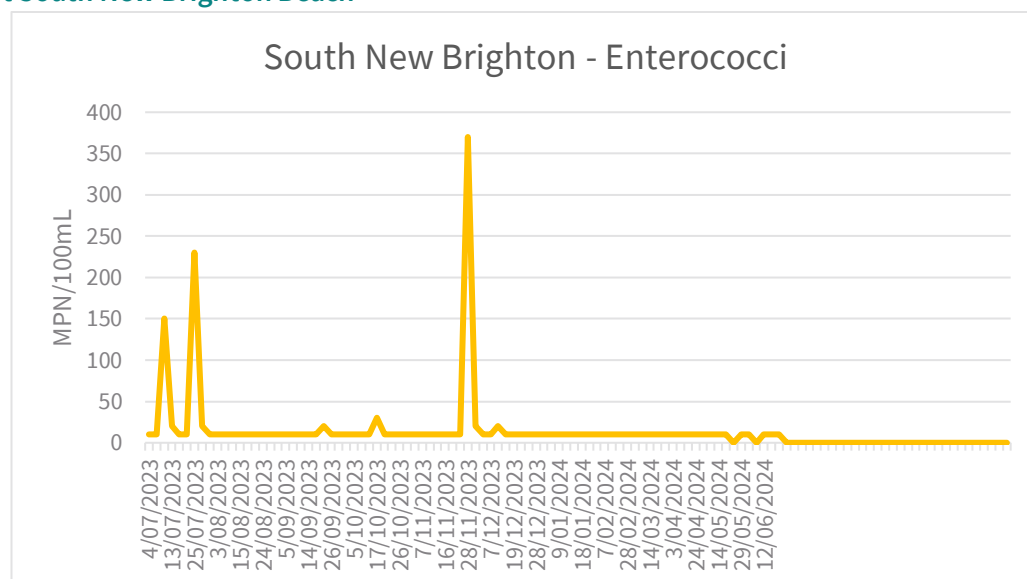
There were no exceedances of the 280MPN/100 mL Enterococci consent limit at Sumner Beach this reporting period.

2.2.4 Faecal Coliform Levels at Sumner Beach



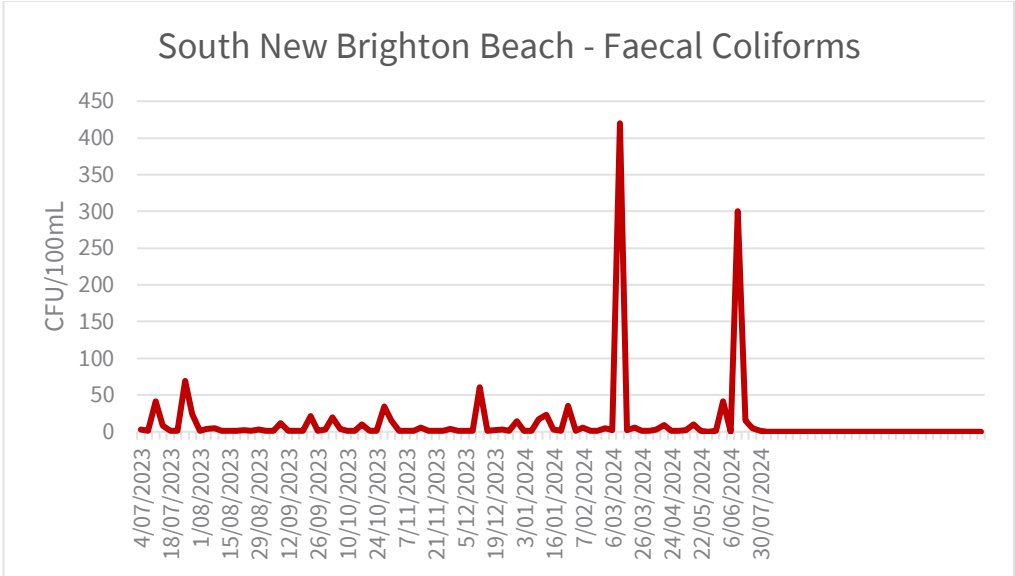
There were 4 exceedances of the 43CFU/100 mL Faecal Coliform consent limit at Sumner Beach this reporting period, with sample results of 48CFU/100 mL returned on 15/08/2023, 360CFU/100 mL on 17/10/2023, 58CFU/100 mL on 23/01/2024 and 112CFU/100 mL on 19/06/2024. The beach was resampled within 48rs on each occasion, and a compliant sample result below the consent limit was returned.

2.2.5 Enterococci Levels at South New Brighton Beach



There was 1 exceedance of the 280MPN/100 mL Enterococci consent limit at South New Brighton Beach this reporting period, with a sample result of 370MPN/100 mL returned on 28/11/2023. The beach was resampled within 48rs on each occasion, and a compliant sample result below the consent limit was returned.

2.2.6 Faecal Coliform Levels at South New Brighton Beach



There were 4 exceedances of the 43CFU/100 mL Faecal Coliform consent limit at Sumner Beach this reporting period, with sample results of 69CFU/100 mL returned on 25/07/2023, 61CFU/100 mL on 12/12/2023, 420CFU/100 mL on 12/03/2024 and 300CFU/100 mL on 12/06/2024. The beach was resampled within 48rs on each occasion, and a compliant sample result below the consent limit was returned.

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 and were identified in the AEE. These requirements are summarised in Table 2.3.2. The results are attached to the quarterly reports as required.

Table 2.3.2 Receiving Environment Monitoring Consent Compliance Jul 2022- Jun 2023

Consent Condition	Parameter	Frequency	Compliance Condition	Grade
23	Marine Sediments	5-yearly	Done 2022, next due 2027	😊
25	Benthic Invertebrates	5-yearly	Done 2022, next due 2027	😊
26	Epibenthic Fauna	5-yearly	Done 2022, next due 2027	😊
27	Shellfish/Tuatua	Ceased	Complied	😊
29	Complaints	As required	Recorded and reported	😊
31	Annual Report	Annually	Report and information lodged with ECan	😊
32	Quarterly 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	😊
36	Community Liaison Group	Annually	Scheduled for 9/10/2024	😊

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

2.4 Comments on other conditions

Conditions 23 - 26

Sediment, benthic and epibenthic testing was carried out in July 2022. This sampling is next due in 2027.

Condition 27

Shellfish were last sampled and analysed in June 2022. The monitoring required by this condition shall cease two years after commissioning the outfall or after two years of continuous compliance with the standard.

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 Environment Canterbury

Condition 36

In 2017, Environment Canterbury agreed that due to negligible interest in our community meeting that we could forgo holding it unless requested by the community.

After the fire at the CWTP in 2021, it was decided to restart the Community Liaison Group meetings be held to allay the community concerns regarding the potential odours from the ponds during the coming months.

This meeting was held on 20/09/2023, and the presentation is available on the external CCC website:

<https://ccc.govt.nz/services/water-and-drainage/wastewater/treatment-plants/christchurch-wastewater-treatment-plant/community-liaison-group/>

In response to the decline in pond health and subsequent odour issues last winter, we implemented a multi-faceted communication strategy to keep all parties informed of what work was taking place to improve the functionality of the plant and pond health, and the results of air quality monitoring.

An integral part of this strategy was the establishment of a web page dedicated to the recovery of the wastewater treatment plant fire, as well as Newsline stories, videos, infographics and newsletters that residents could view. This website and newsletters are still being actively maintained.

The next CLG meeting is scheduled for **9/10/2024**.