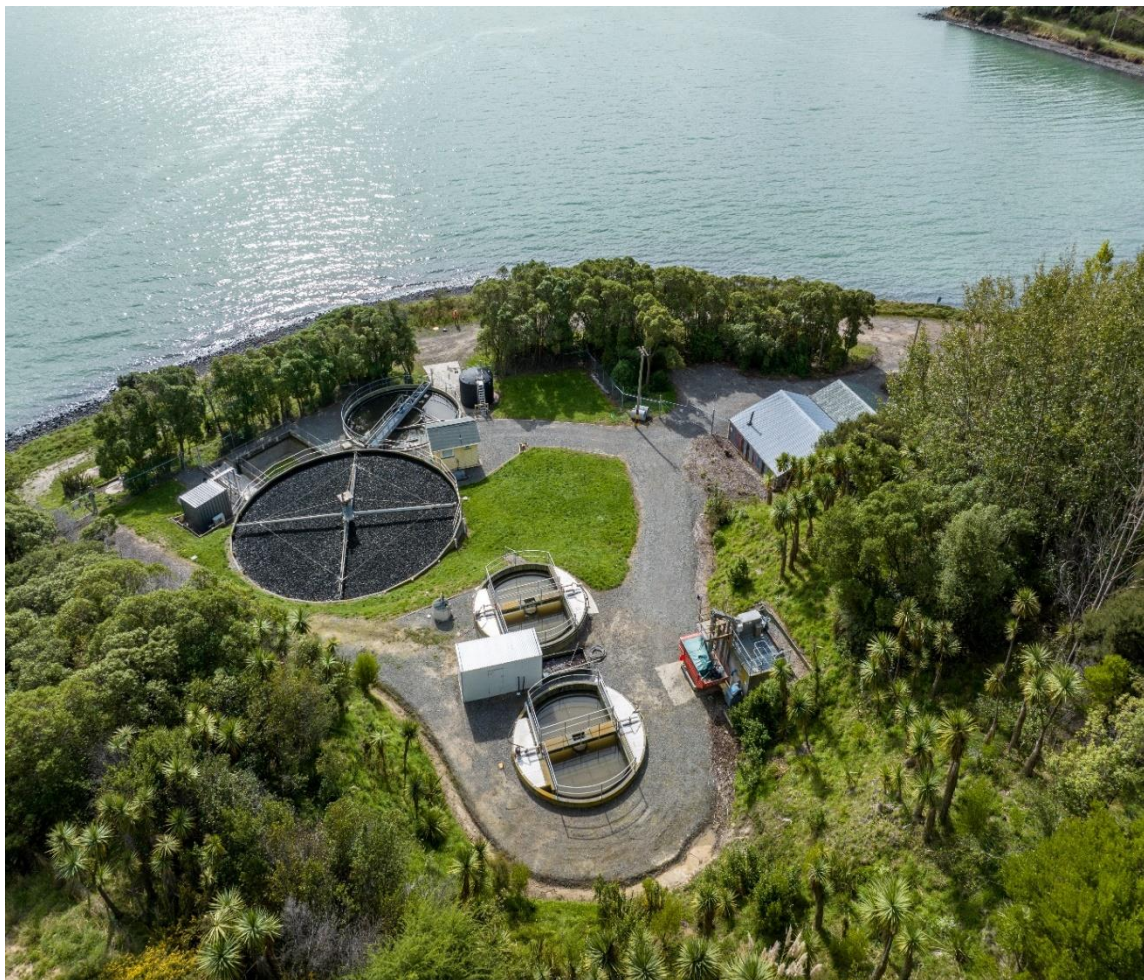


CRC204086

Akaroa Wastewater Treatment Plant

Condition 19 – Annual Report

1 July 2022 – 30 June 2023



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The Treatment Plant

The Akaroa WWTP is located at Takapūneke, at the end of Beach Road south of Akaroa Township, on the Banks Peninsula (BP).

The WWTP is situated at Red House Bay on the east side of Akaroa Harbour as shown in Figure 1. The edge of the bay is defined by rocky outcrops that are exposed at low tide, with the northern rocky outcrop commonly referred to as Green Point (Kingett Mitchell Ltd, 2006). The WWTP outfall extends approximately 100 m offshore, in approximately six to eight metres of water depending on the tidal cycle (MWH New Zealand Limited, 2006).

The outfall is an open-ended pipe attached to one anchor block (Kingett Mitchell Ltd, 2006). The bay in this area is relatively shallow within 50 – 80 m of the shoreline and rapidly deepens with increasing distance (Kingett Mitchell Ltd, 2006). Figure 2.



Figure 1 Akaroa WWTP Location (Source: Google Earth)

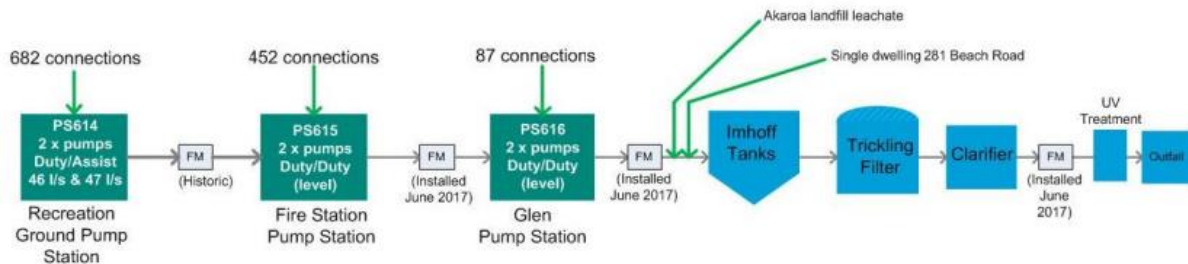


Figure 2 Outfall Akaroa WWTP.

Wastewater Treatment Process

Wastewater from Akaroa flows via gravity to three pump stations near the waterfront, located at the Recreation Ground at North Akaroa, the Fire Station at Mid Akaroa and The Glen at South Akaroa.

Wastewater is pumped from the pump station at The Glen via a rising main to the inlet screen located on top of the flow balancing/splitting tank at the top of the WWTP site, see Figure 3.



The screened wastewater is split evenly to the two Imhoff tanks in the flow balancing/splitting tank. Primary solids settle out of the wastewater and are stored and anaerobically digested in the bottom of the Imhoff tanks. Settled wastewater from the Imhoff tanks flows to the trickling filter inlet chamber where it combines with recycled trickling filter wastewater.

The combined wastewater flows by gravity to the trickling filter distributor arm where it is applied to the trickling filter rock media where the wastewater is treated by biological processes.

Wastewater from the trickling filter drains to the trickling recycle chamber where a submersible pump recycles some of the wastewater back to the trickling filter inlet chamber to maintain the minimum required wetting rate for the media.

Wastewater that is not recycled flows to the secondary clarifier where biological solids from the trickling filter (called humus) settle out. The humus is removed from the bottom of the clarifier and pumped to the flow splitting tank where it settles in the Imhoff tanks with the primary solids.

Clarified wastewater flows from the clarifier to the UV disinfection system, then through a channel beneath UV lamps where it is disinfected.

The disinfected wastewater then normally flows by gravity through the outfall pipe into Akaroa Harbour via an open-ended 160 mm diameter outfall pipe. During periods of high flow and/or high tides, a booster pump located in a wet well downstream of the UV system is automatically activated to push wastewater through to the outfall.

The outfall extends 100 m into Red House Bay, as shown in Figure 3.

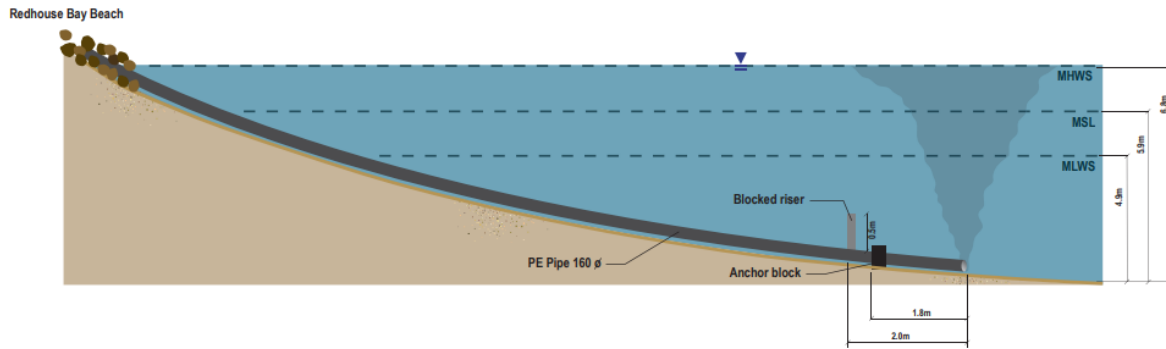
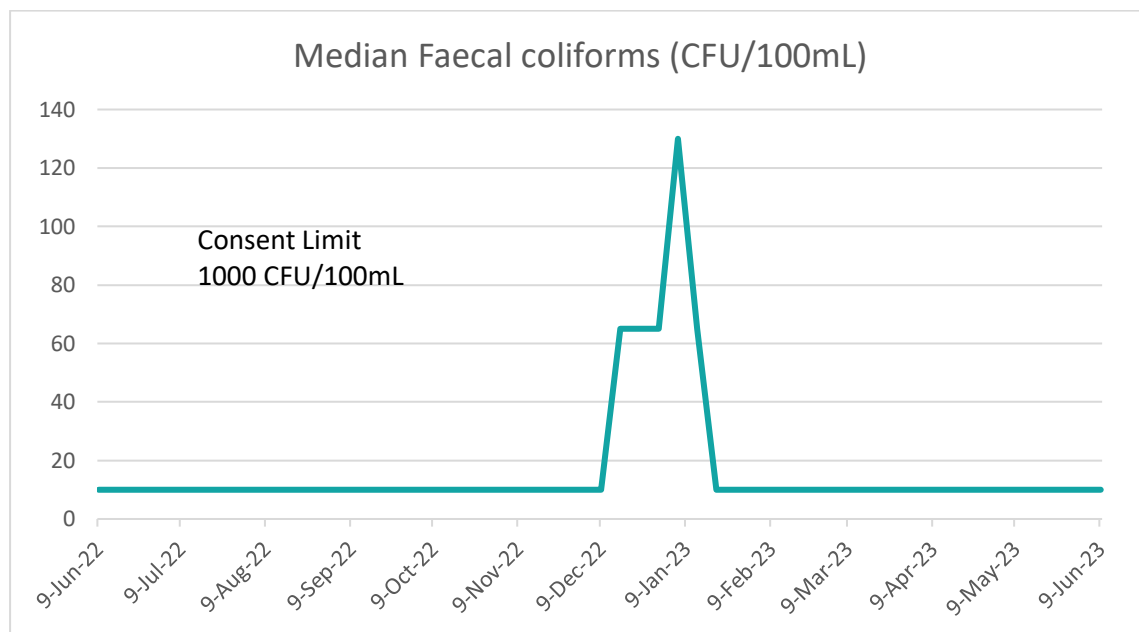


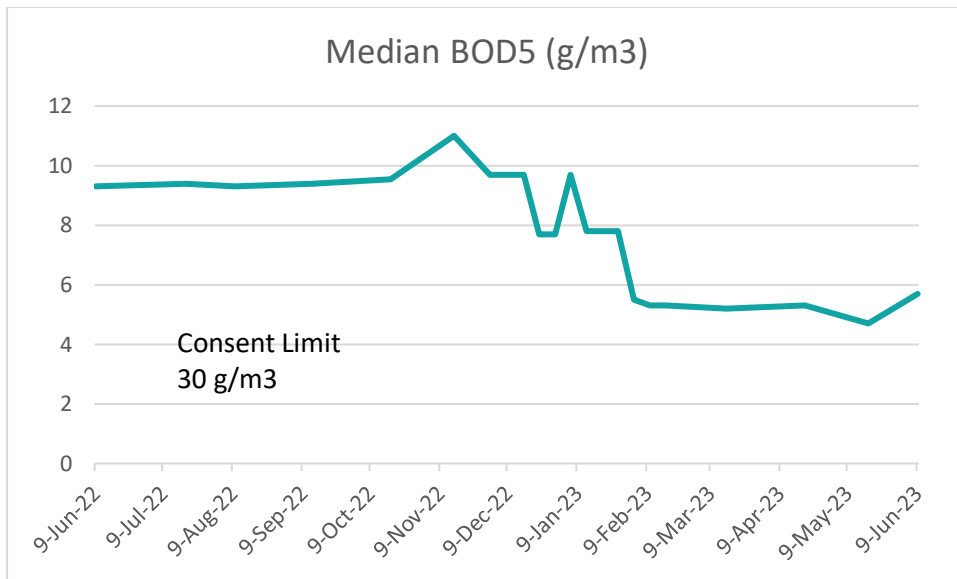
Figure 5 Schematic configuration of outfall

Condition 19a. See Appendix A for results of the monitoring undertaken for this reporting period.

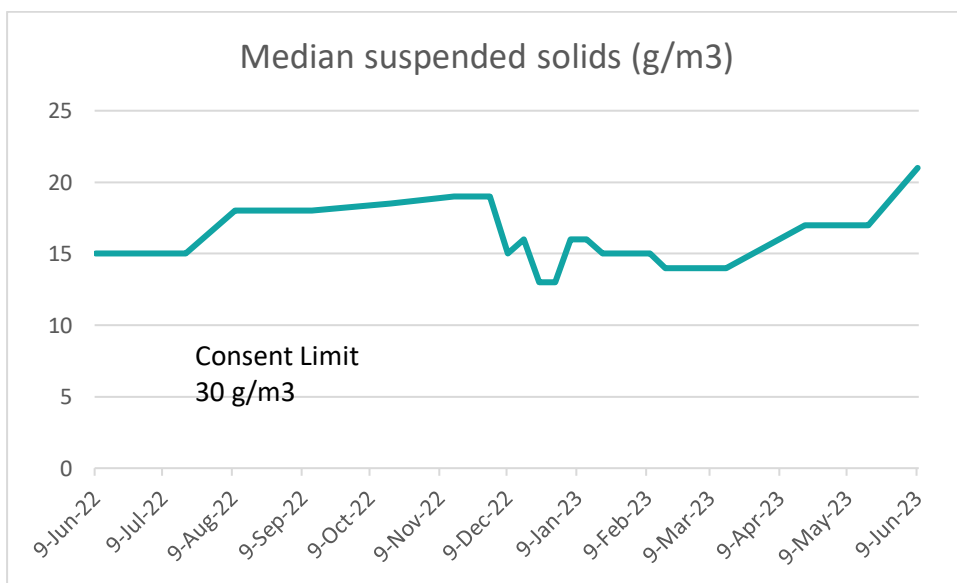
Condition 19b. An analysis of monitoring results against limits and trigger values specified in Conditions 9 (median faecal coliforms), 10 (median BOD5), 11 (median TSS) and 14 (RW median faecal coliforms) of this resource consent.



The median Faecal coliforms sampled after wastewater treatment and prior to discharge into Akaroa Harbour via the outfall did not exceed the consent limit of 1000 CFU/100mL.

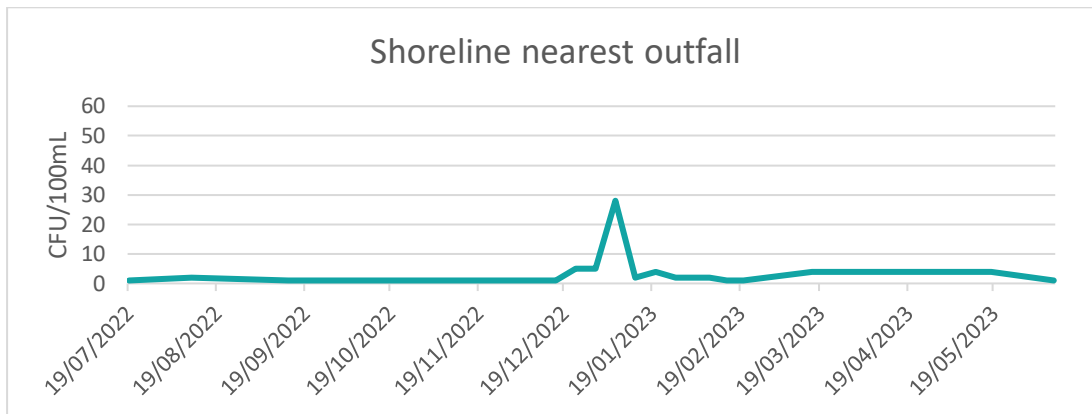


The median BOD5 sampled after wastewater treatment and prior to discharge into Akaroa Harbour via the outfall did not exceed the consent limit of 30 g/m3.

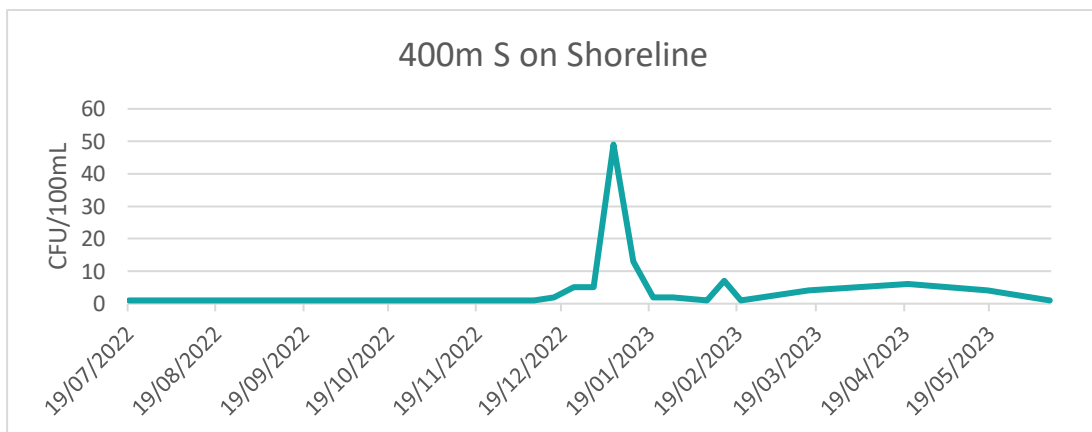


The median Total Suspended Solids sampled after wastewater treatment and prior to discharge into Akaroa Harbour via the outfall did not exceed the consent limit of 30 g/m3.

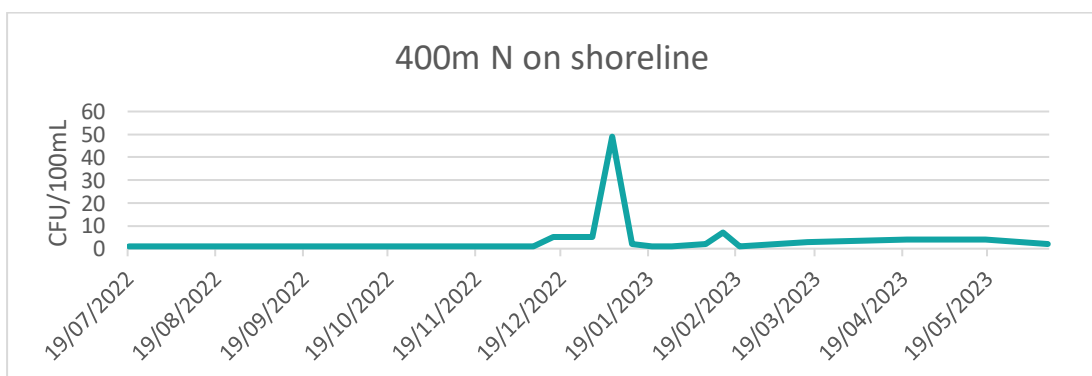
Median Faecal Coliforms in Receiving Water



There was one exceedance of the rolling median of 14 faecal coliforms per 100 millilitres from the previous five samples collected at the shoreline nearest the outfall of 28 on 6/1/2023.

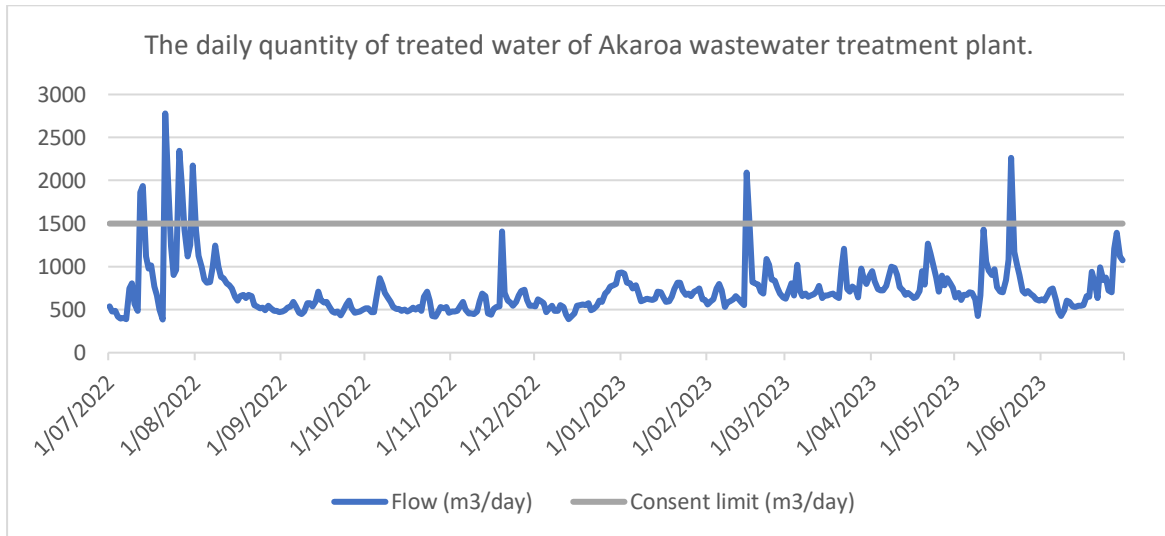


There was one exceedance of the rolling median of 14 faecal coliforms per 100 millilitres from the previous five samples collected at the shoreline nearest the outfall of 29 on 6/1/2023.

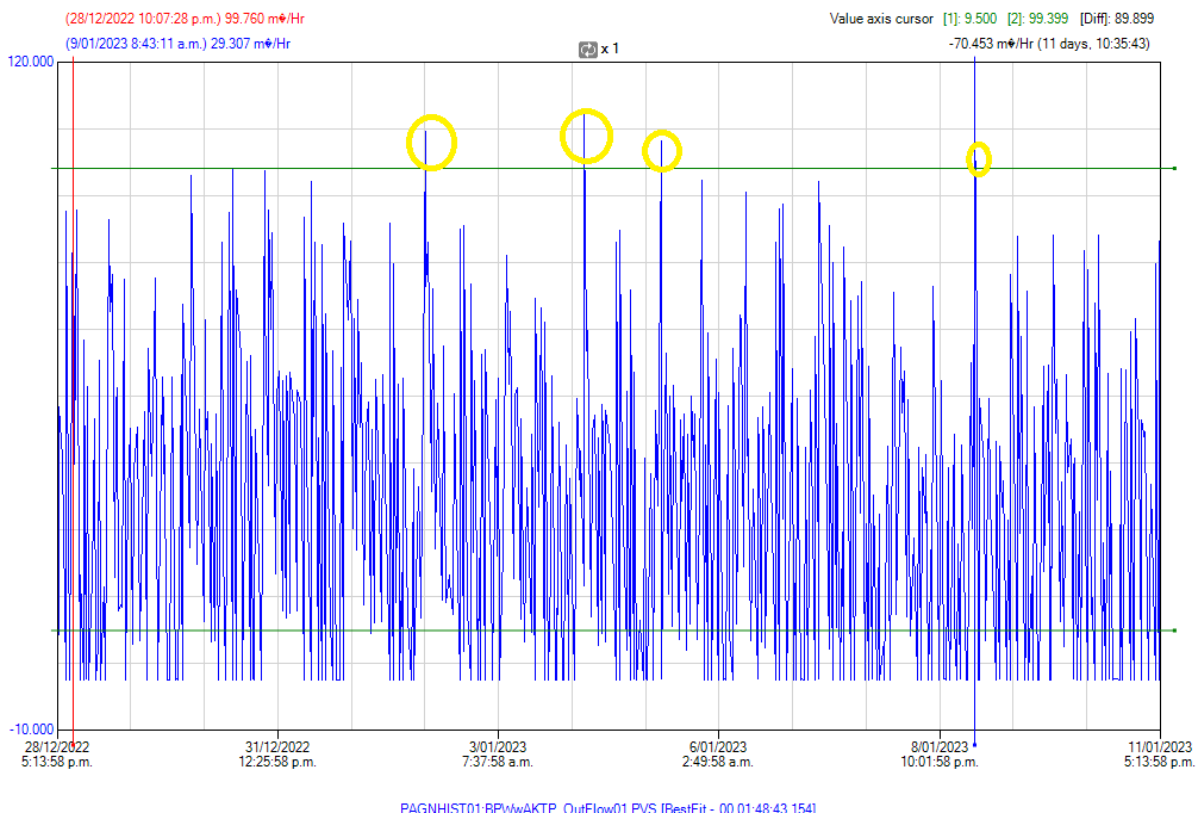


There was one exceedance of the rolling median of 14 faecal coliforms per 100 millilitres from the previous five samples collected at the shoreline nearest the outfall of 49 on 6/1/2023.

Flow Data



In addition, during the year there were cases in which the discharge in the treatment plant exceeded the maximum hourly flow rate of 99 m3/h designed for the plant. These events occurred outside of rainfall events and were related to abrupt increases in flow attributed to increased population levels during holiday periods, especially during the month of January.



In response to this, a continuing effort is being made to formulate a contingency plan. This strategy implies the possible activation of the bypass (valve 225.0 OV001) from the UV channel to the chlorine contact tank during times of high flow or festive periods.

Condition 19c. *An analysis of the extent of correlation between the receiving water monitoring results and treated wastewater monitoring results, as required in Conditions 7 (treated wastewater contaminants), 12(receiving environment bacterial samples), and 13 (RW sampling schedule). This shall include an assessment of the information collected for Condition 17 (environment parameters), its impact on the results and any changes to the sampling regime as a result of this analysis that have been agreed with Canterbury Regional Council;*

There was one sample round during the monitoring year where the faecal coliform median was exceeded, this was in early January and elevated levels were reported at the all 3 Receiving Water sample sites, in correlation with elevated median faecal coliforms sampled at the plant. As Akaroa is a popular summer holiday destination, the population increases approximately 5 times from the year-round permanent population of 1000 people (including Takamatua) and this extra load creates stress on the treatment plant.

Condition 19d. *Comparison of monitoring results as required in Conditions 7 (treated wastewater contaminants), 12(receiving environment bacterial samples), and 13 (RW sampling schedule) with historical data;*

There have been singular high sample results during the summer months in most years back to 2012. These results show a one-off annual spike, when the population reaches the summer peak. These results aren't seen during the regular sampling schedule over the year.

Condition 19e. *Comparison of the monitoring results required in Conditions 7 (treated wastewater contaminants), 12(receiving environment bacterial samples), and 13 (RW sampling schedule) with operation and performance issues from the WWTP;*

When the CCC took responsibility for the Banks Peninsula treatment plants in 2021, there was a large amount of maintenance that had been deferred at each of the 4 treatment plants on the Peninsula. We are slowly catching up with this backlog and this year have programmed upgrades at Akaroa to the Electrical and Controls systems, repairing and reinstating the Effluent Recirculation System and repairing the flow balancing valve.

Condition 19f. An interpretation of the results in relation to the effects of the discharge on the environment.

The parameters sampled are all below consent levels, except for occasional exceedances caused by faecal coliform levels over public holiday and summer periods. These high levels of faecal coliforms could impact the environment through aerobic decomposition of these coliforms, causing a reduction of dissolved oxygen levels.

Condition 19g and 19h. *Identification of any measures taken to remedy any exceedances and details of all changes or upgrades to the treatment plant that may affect the quality or volume of treated wastewater discharged;*

When the CCC took responsibility for the Banks Peninsula treatment plants in 2021, there was a large amount of maintenance that had been deferred at each of the 4 treatment plants on the Peninsula. We are slowly catching up with this backlog and this year have programmed upgrades at Akaroa to the Electrical and Controls systems, repairing and reinstating the Effluent Recirculation System and repairing the flow balancing valve.

There are also manual log books completed for the daily site checks at the Akaroa Treatment Plant.

Condition 19i. *Summary of any inflow and/or infiltration investigations or works undertaken in the reporting period.*

In February 2023 we completed approximately \$2.6million of I and I works. Data will be collected over the following year before effectiveness can be evaluated.