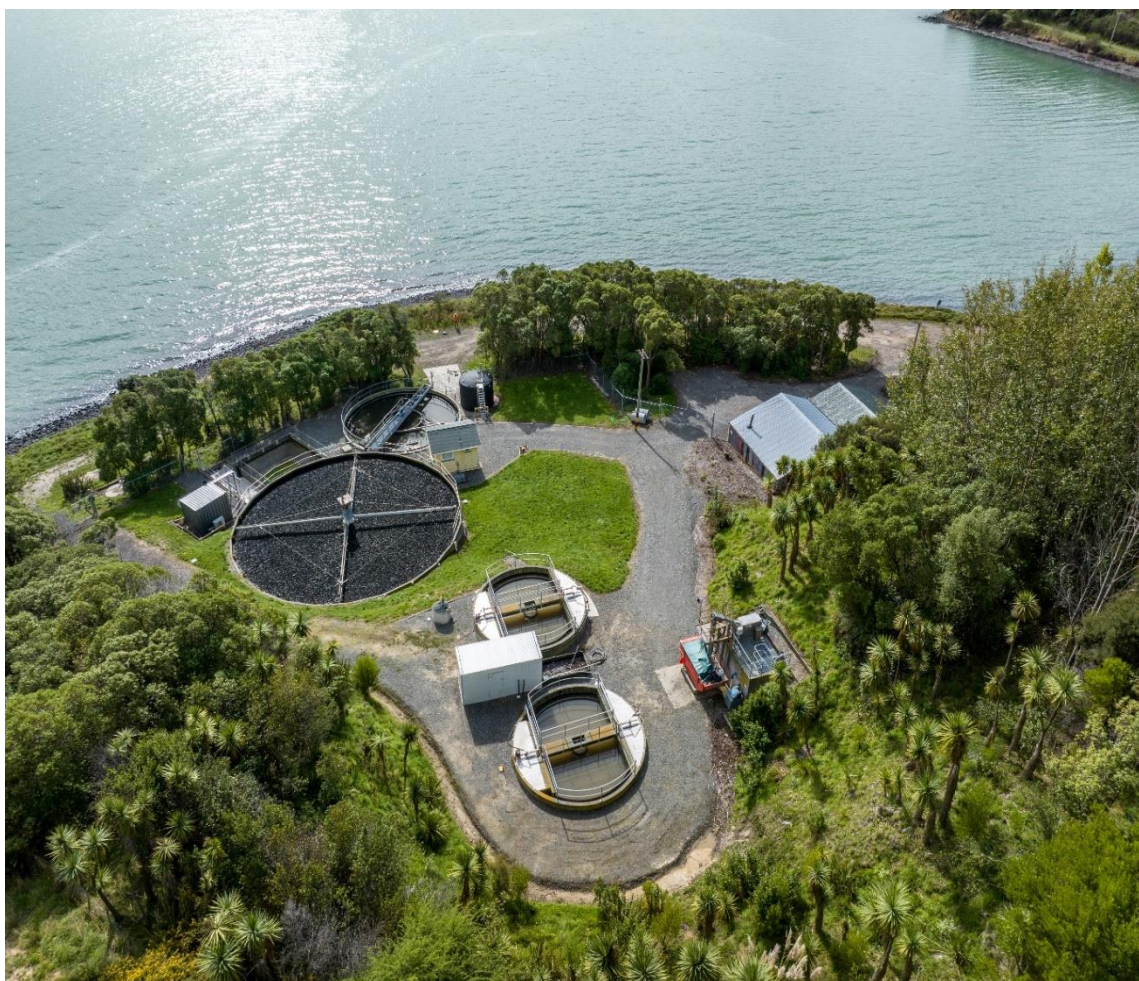


Annual Report

Akaroa Wastewater Treatment Plant

1 July 2023 to 30 June 2024



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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, to a depth approximately six to eight metres of water depending on the tidal cycle (MWH New Zealand Limited, 2006).

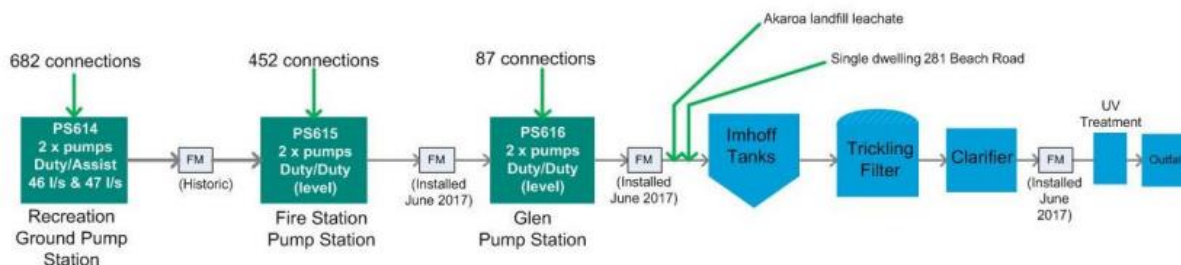


Figure 1 Akaroa WWTP Location

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.

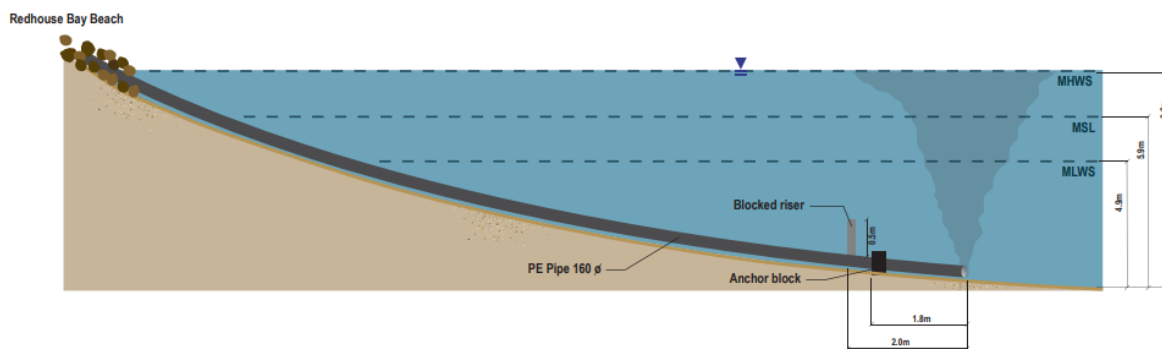
The combined wastewater flows by gravity to the trickling filter distributor arm where it is applied to the trickling filter rock media where the wastewater is treated by biological processes.

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.



Schematic configuration of outfall

Conditions monitored

The following conditions are monitored for this annual report:

Condition 19a. Results of the monitoring undertaken in the previous year from 1 July to 30 June;

- See Attached excel workbook for full results and parameters sampled for this reporting period.

Condition 19b *an analysis of monitoring results against limits and trigger values specified in Conditions 9, 10, 11 and 14 of this resource consent.*

Condition	Location	Parameter and (Limit)	July - Sep	Oct - Dec	Jan - Mar	Apr - June
9	Treated Wastewater	Median Faecal Coliforms (1000 CFU /100mL)	😊	😊	😐	😊
10	Treated Wastewater	Median BOD5 (30g /m3)	😊	😊	😊	😊
11	Treated Wastewater	Median TSS (30g /m3)	😊	😊	😊	😊
14	Receiving Water	Median Faecal Coliforms (14 CFU /100mL)	😊	😊	😊	😊

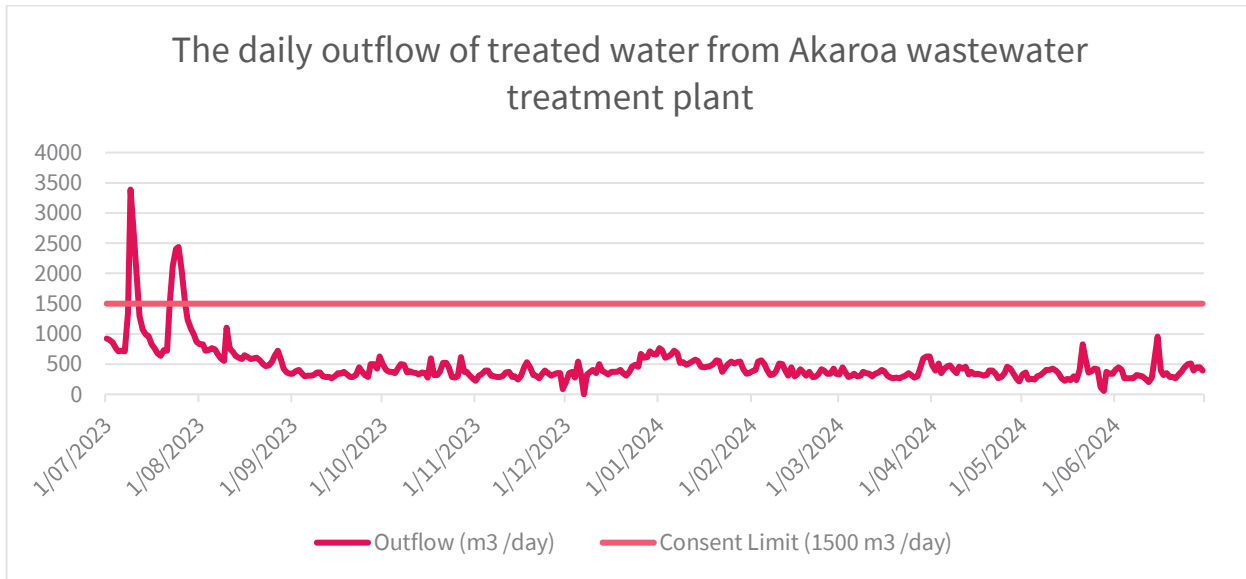
Key: 😊 Full Compliance, 😐 Minor, Isolated or Risk of Non-Compliance, 😞 Major or Consistent Non-Compliance

- Condition 9 commentary: This limit was exceeded twice on the 1 and 4 Jan 2024, with a number of 2000 CRU/100mL due to the extremely high load placed on the plant by the influx of holiday makers to Akaroa.

See Attached excel workbook for full receiving water sample results.

Flow Data

- See Attached excel workbook for flow Data.



Date	Outflow (m3/day)	Consent limit (m3/day)	Rainfall (mm/day)
9/07/2023	3388	1500	65.8
10/07/2023	2656	1500	43.6
11/07/2023	1897	1500	13.2
23/07/2023	2130	1500	198.8
24/07/2023	2402	1500	47.6
25/07/2023	2438	1500	1.2
26/07/2023	2031	1500	9.8
27/07/2023	1530	1500	2.2

The consent limit for flow was exceeded 8 times in FY24, all of these could be correlated with high rainfall, where there were events of a total of 30 millimetres or more over three consecutive days

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 were no links between the sample results at the plant, and what was returned for receiving water. When high receiving environment bacterial samples were returned, the samples taken at the plant outfall showed low levels of bacteria.

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 returned from treated wastewater, primarily 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.

There has also been the odd instance of an elevated median value in the receiving environment samples, but at the same time, the treated wastewater samples have been under the guideline values.

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 of the treated wastewater are all below consent levels, except for occasional exceedances caused by elevated faecal coliform levels over 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.

The samples taken of the receiving environment are generally not affected by the treated wastewater discharged. There are no obvious links between samples taken of the different areas.

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.*

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There are scanned manual logbooks completed for the daily site checks at the Akaroa Treatment Plant to be sent as separate files to this report.

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.
- The volume of inflow and infiltration for this reporting is estimated at 14.8%, which shows that the works have been effective.

Inflow and Infiltration Reduction Estimate	
Residential flow	80,896 m ³ /year
Commercial flow	48,154 m ³ /year
Water treatment plant backwash	16,545 m ³ /year
Legitimate flow	145,595 m³/year
Total flow to treatment plant	170,857 m ³ /year
I&I Estimate	14.8%