

Duvauchelle Wastewater Treatment Plant

Annual Report FY25

July 2024 to June 2025

CRC230358



Prepared By	Reviewed By	Approved By	Completed
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1. Introduction

1.1 Background

The settlement of Duvauchelle lies at the northern end of Akaroa Harbour on State Highway 75. It is a popular destination particularly in summer when the use of holiday houses and the local campground increases the population. Christchurch City Council (Council) operates the Duvauchelle Wastewater Treatment Plant (WWTP) located at 6137 Christchurch Akaroa Road. Treated wastewater is discharged into Akaroa Harbour via a 1750m long outfall pipeline of 150mm diameter. Figure 1-1 shows the location of the WWTP, associated infrastructure including catchment pump stations and outfall. The boundary between the Class Coastal Recreation (CR) water quality area (to the north of the line) and Class Shellfish Gathering (SG) water quality area (to the south of the line) as prescribed in the Canterbury Regional Coastal Environment Plan, is also shown.



1.2 Description of Wastewater Scheme

The Duvauchelle WWTP was commissioned in 1988 at the location shown in Figure 1-1. There were minor upgrades in 1996 and 2002. The WWTP serves a community of approximately 180 permanent residents. In summer, the population increases significantly due to visitors to the campground and holiday homes. There are approximately 250 dwellings within the settlement. The peak design capacity population is just under 900 population equivalents (PE). The plant can accommodate a peak flow of at least 600m³/day¹. Raw wastewater is pumped to the WWTP from two pumping stations (PS 608 and PS 609) which are fed by the local gravity sewerage network. These pumping stations are located on SH75 near the garage (to the south of the Akaroa Golf Club) and in the campground. Figure 2-1 shows the catchment served by the WWTP. Currently, the incoming wastewater receives both primary and secondary treatment (which comprises initial screening, primary sedimentation, rotating biological contactors, secondary sedimentation tanks and sludge decant tanks), followed by UV disinfection before discharge through an outfall into Akaroa Harbour. Sludge is stored on site in sludge decant tanks and is periodically trucked to the Christchurch WWTP for processing into biosolids.

2. Annual Report

Condition 22 of CRC230358

This condition sets out the content required to be presented in the Annual Report.

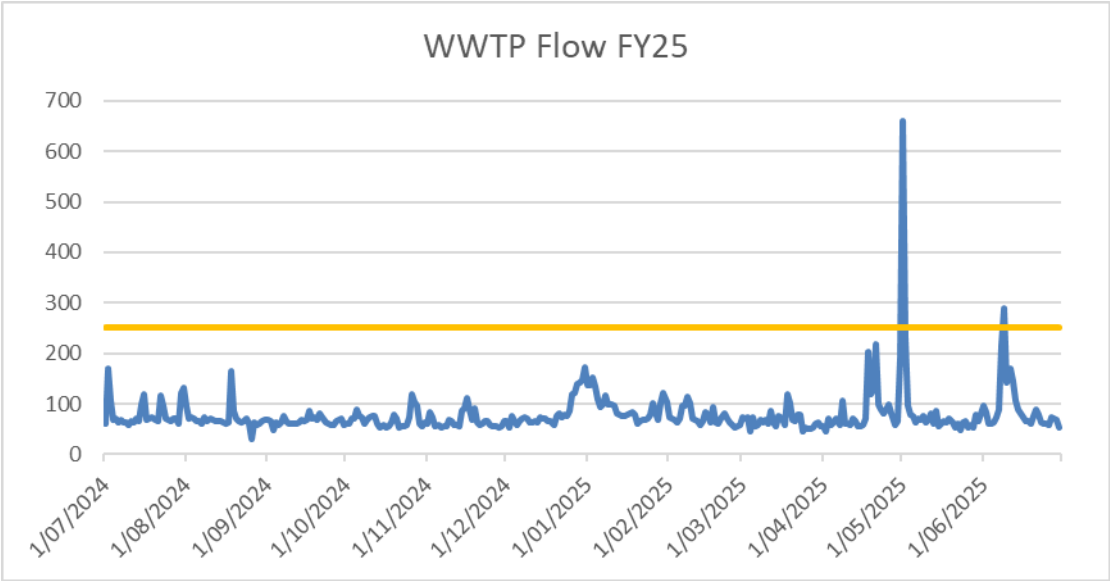
22. The Consent Holder must submit to the Canterbury Regional Council, Attention: Regional Leader – Compliance Monitoring, and Te Runanga o Onuku, Attention: Environment Portfolio, an Annual Report prepared by a suitably qualified person by 31 August each year which includes, but is not limited to the following:

- a. Results of the monitoring required under this resource consent undertaken in the previous year from 1 July to 30 June. Results must be provided in a digital format that is mutually acceptable for ongoing monitoring; (attached excel spreadsheet)
- b. An analysis of monitoring results against the limits, trigger values and guideline values specified in Conditions (4), (8), (9), (10), (11), (12), (13), (14) and (17) of this resource consent;
- c. Comparison of the monitoring results required in Conditions (4), (8), (9), (10), (11), (12), (13), (14) and (17) with historical data;
- d. An interpretation of the monitoring results in relation to the effects of the discharge on the environment;
- e. Summary of what measures the Consent Holder has implemented or will implement to mitigate any adverse environmental effects as a result of the exceedances of any trigger values and to prevent a reoccurrence;
- f. Details of any changes or upgrades to the wastewater treatment plant that may affect the quality or volume of treated wastewater discharged; and
- g. Details of any outfall monitoring undertaken in the reporting period, required under Condition (19).

2.1 Parameters Monitored

Condition 4 – Outflow Volume

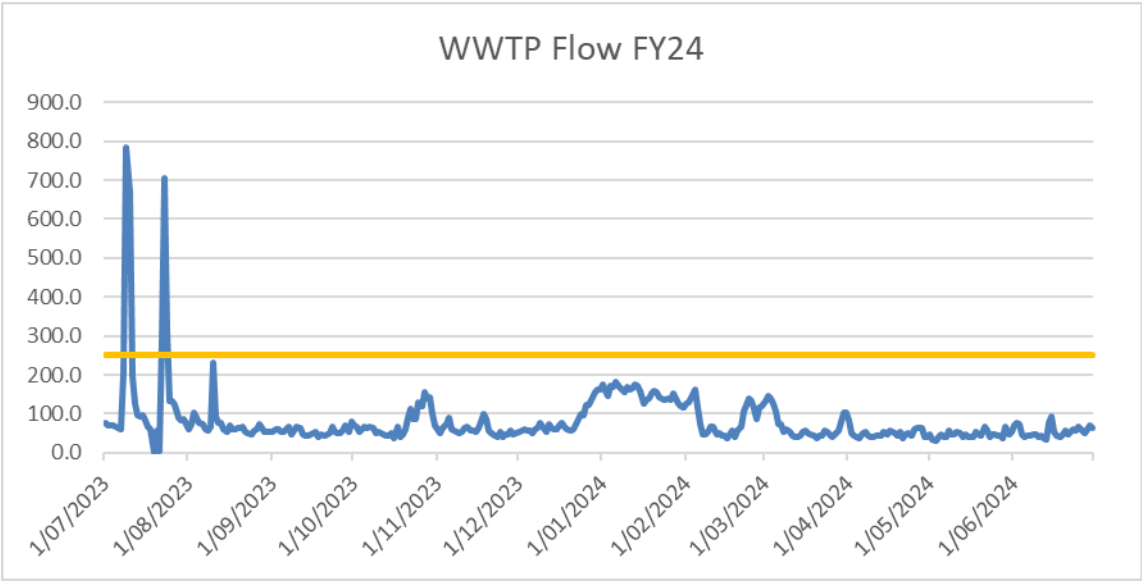
FY25



There were two exceedances in flow volume of 661m3 on 1/5/2025 and 289m3 9/6/2025. These were both wet weather events (see below table for details) and they did not exceed the wet weather volume limit of 750m3.

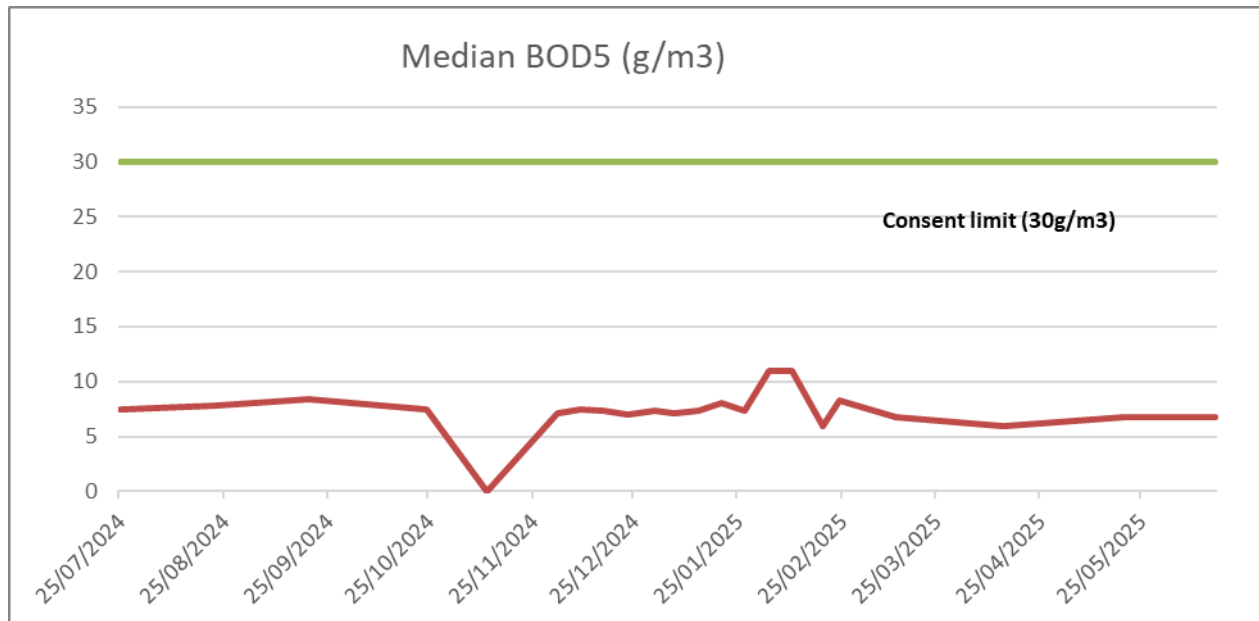
Date	Discharge (m3/day) (limit 250m3 for dry)	Rainfall (mm/day)	Consent limit (dry weather)	Consent limit (wet weather)
30/04/2025	190	140.4	250	750
1/05/2025	661	158.2	250	750

Historic Flow Data



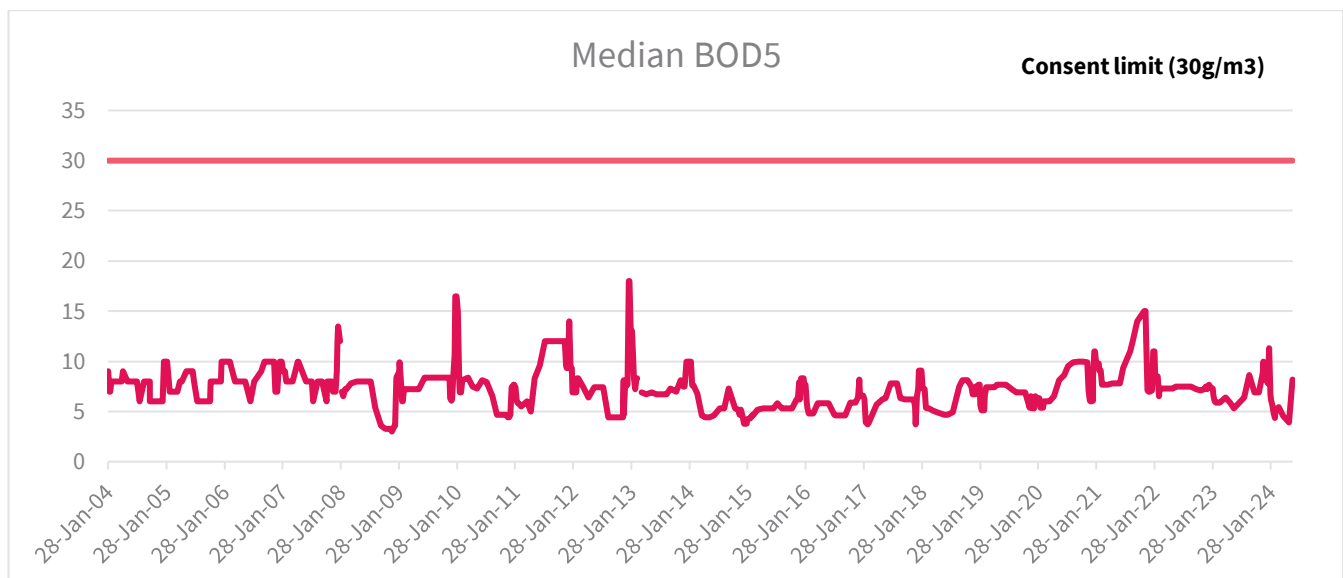
Condition 8 – Median BOD5

FY25 samples



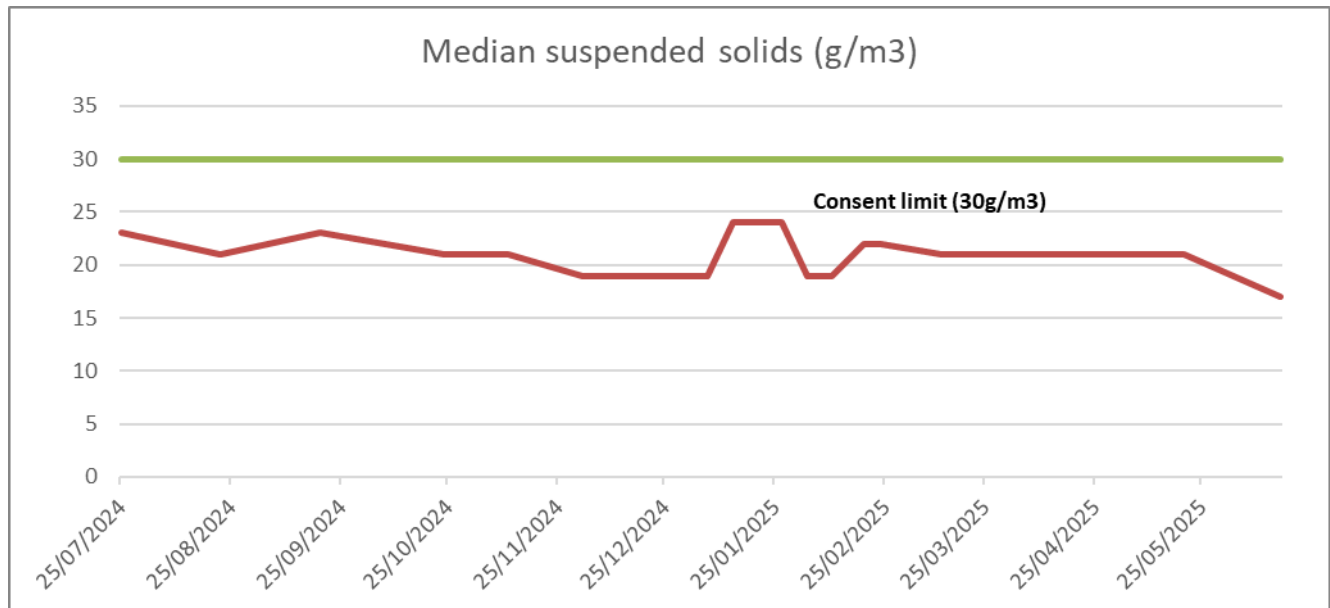
There have been no exceedances of the consent Limit of 30 g/m3 during this reporting period.

Historic data



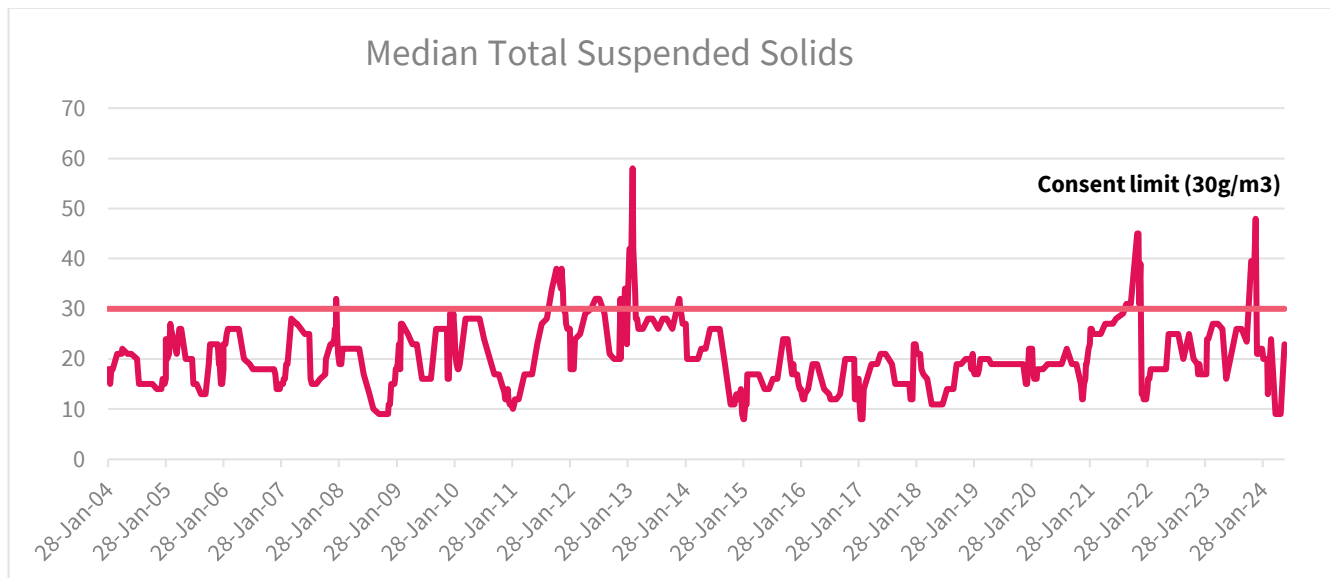
The median concentration of five-day biological oxygen demand in the treated wastewater has not exceeded the consent limit of 30 grams per cubic metre since records were kept starting in 2004.

Condition 9 - Total Suspended Solids (TSS) FY25



There have been no exceedances of the TSS consent Limit sampled over the year.

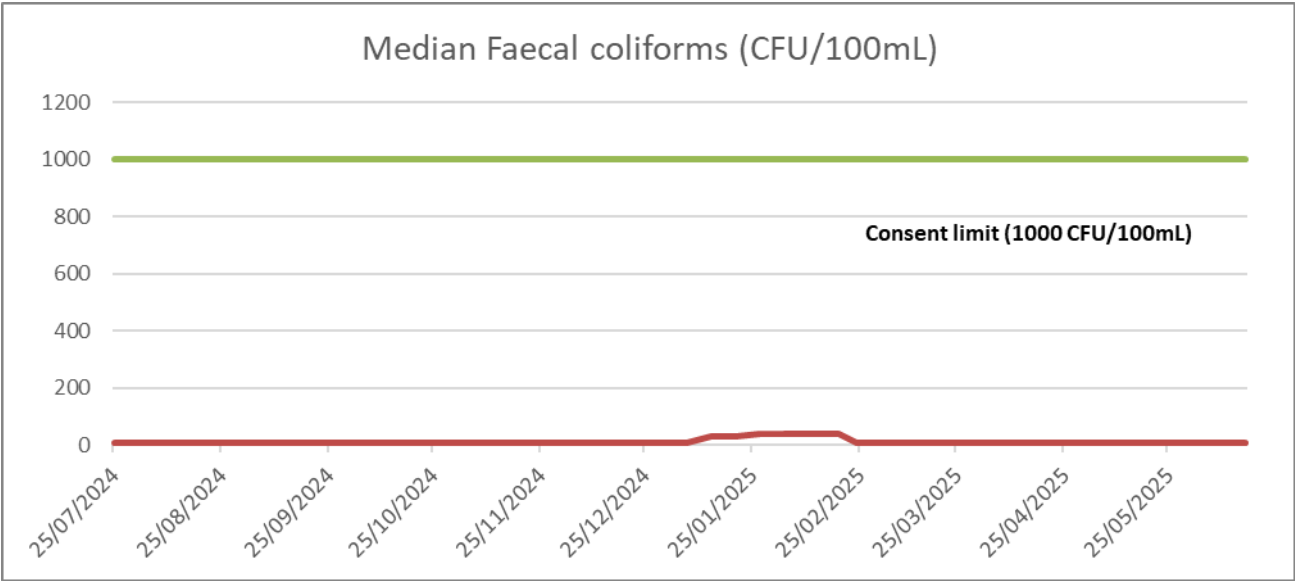
Historic Data



The median concentration of suspended solids in the treated wastewater occasionally exceeds the consent limit of 30 grams per cubic metre since records were kept starting in 2004.

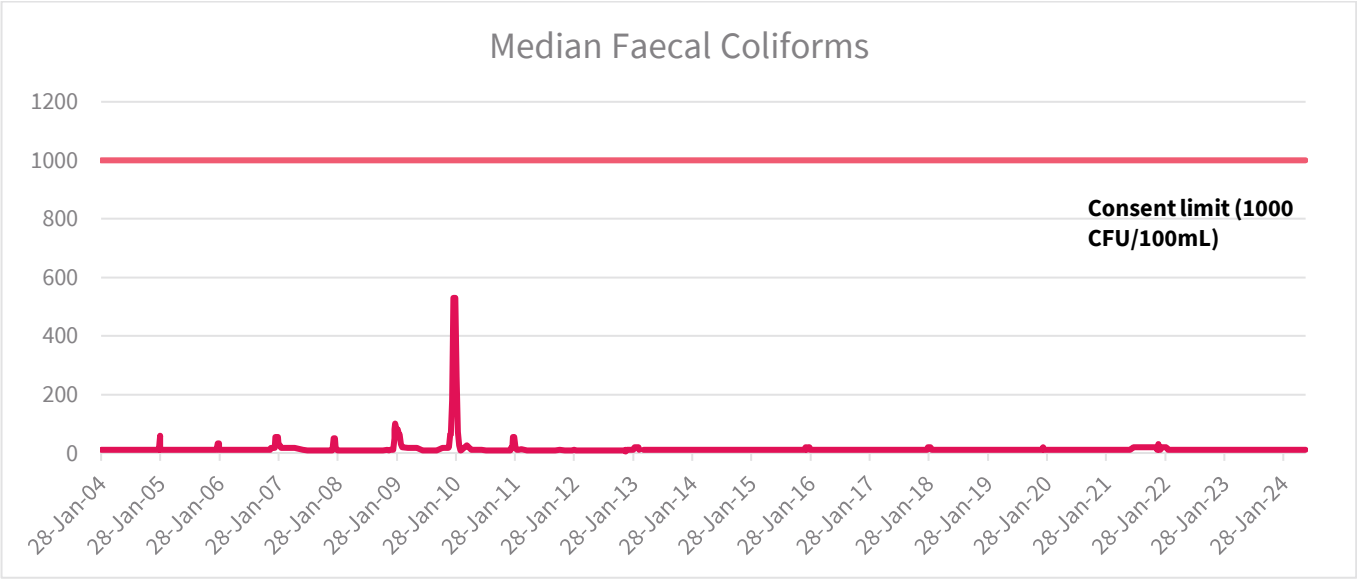
These isolated spikes of higher results have all fallen during the busy summer months, where the exponential increase in population visiting for the summer has increased the load on the WWTP. These higher TSS numbers are due to the high flows not allowing as much settling time for the wastewater.

Condition 10 - Faecal Coliforms
FY25



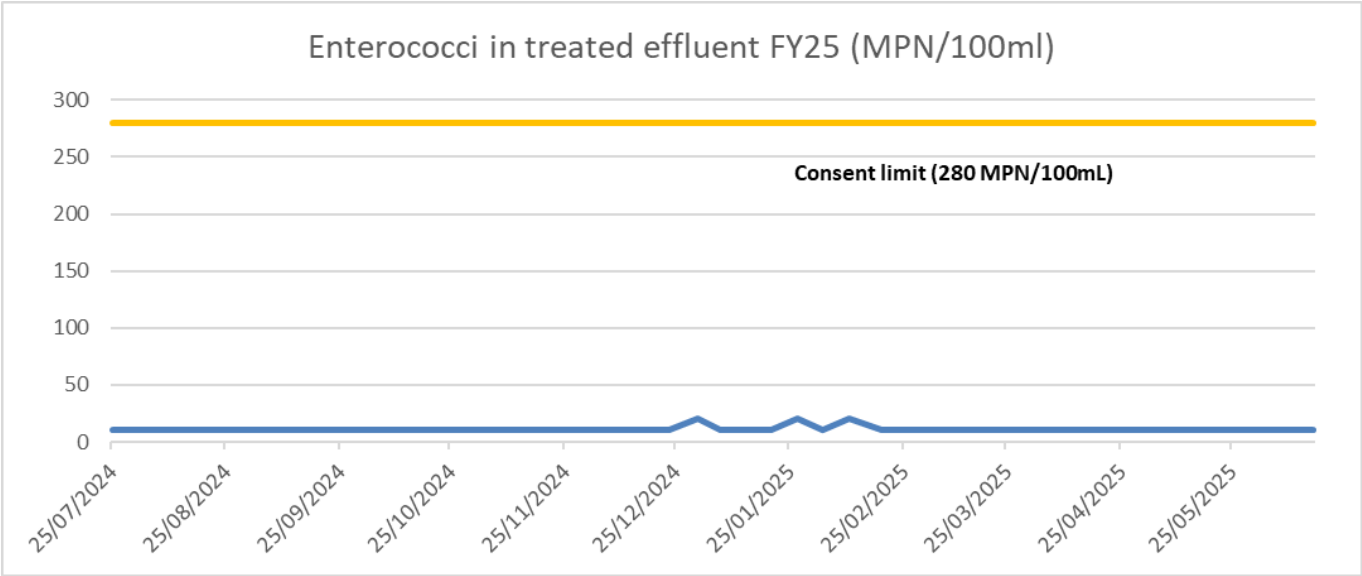
There have been no exceedances of the consent Limit of 1,000 CFU/100mL in FY25 at the treatment plant.

Historic Data

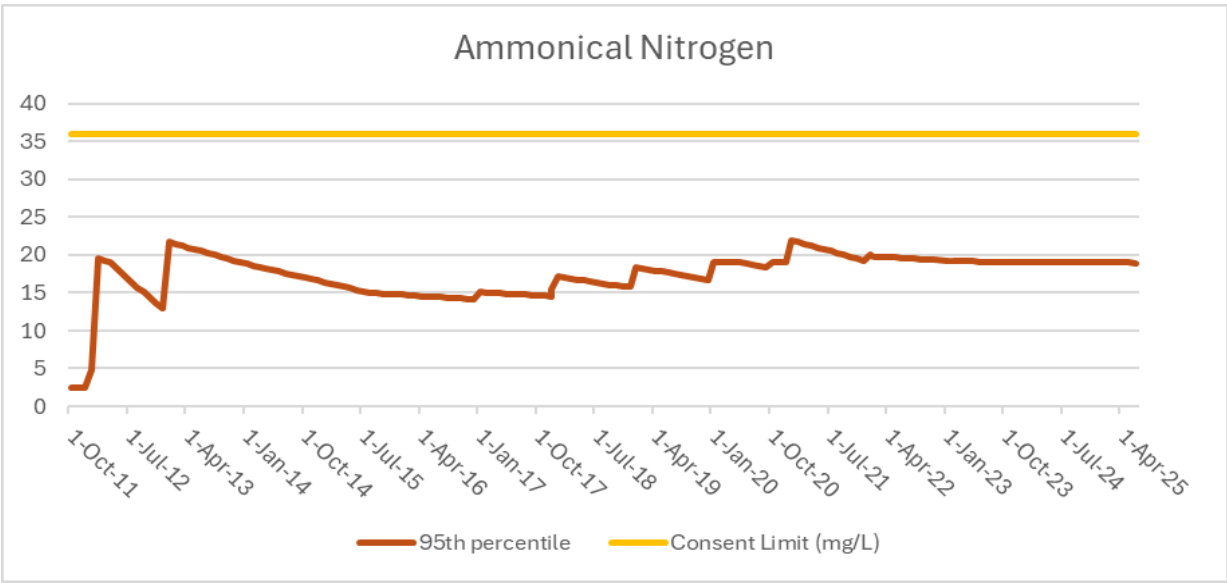


The median concentration of five-day biological oxygen demand in the treated wastewater has not exceeded the consent limit of 1,000 coliform forming units (CFU) per 100 millilitres of treated wastewater since records were kept starting in 2004.

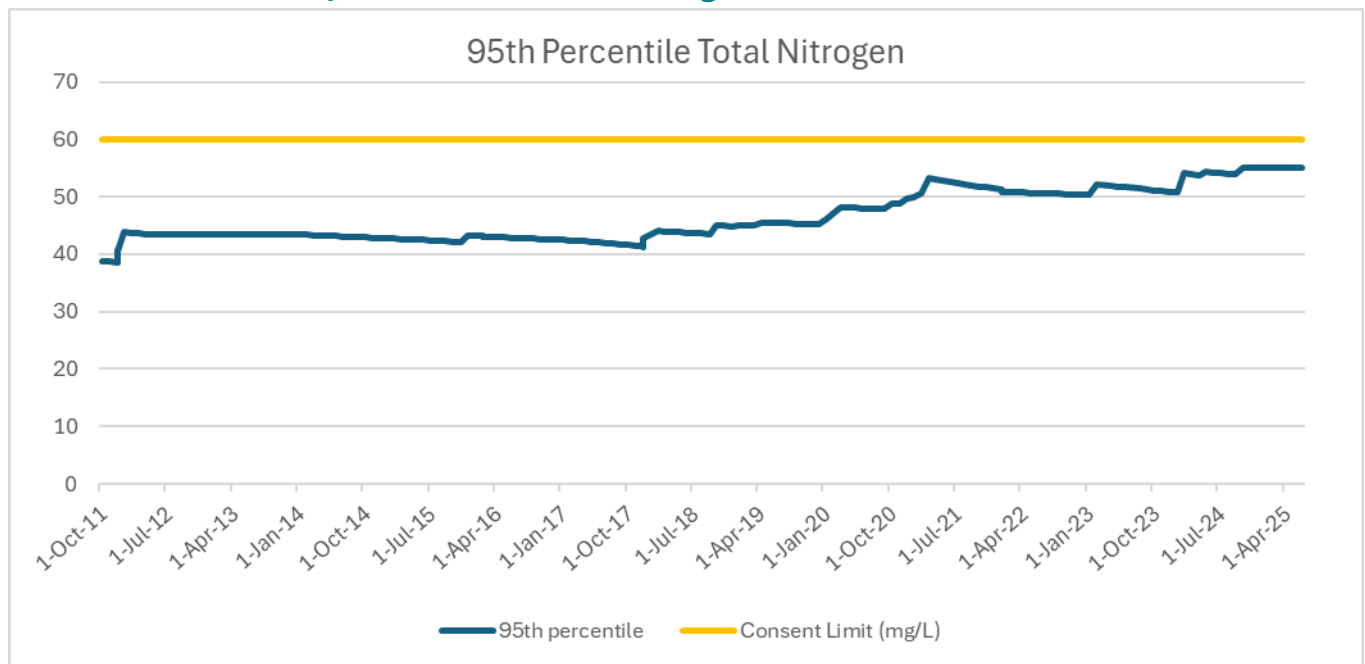
Sampled and Analysed - Enterococci



Condition 11 - 95th percentile of ammonical nitrogen

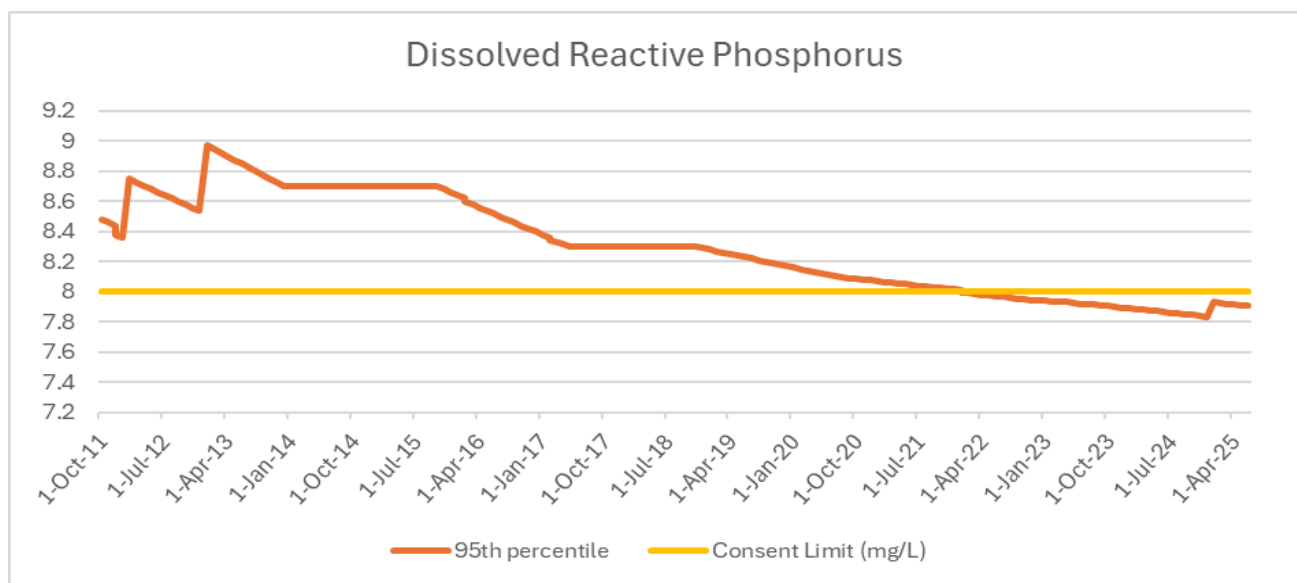


Condition 12 – 95th percentile of total nitrogen



As you can see on the graph above, the 95th percentile of total nitrogen is beginning to trend towards the upper consent limit. We have identified a potential solution to address this through changing the flow of the wastewater through the plant, as the root cause is due to the current plant design, which does not include a dedicated anoxic stage for nitrate/nitrite reduction after treatment in the Rotating Biological Contactors (RBCs).

Condition 13 – 95th percentile of dissolved reactive phosphorus

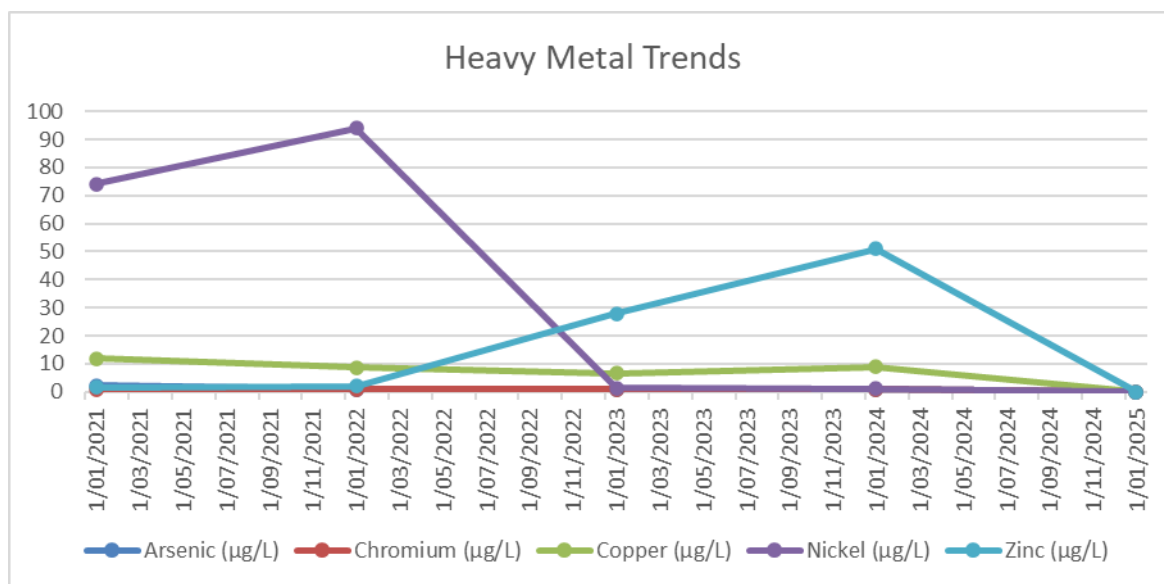


DRP 90th percentile has been trending very close to the consent limit, but as it is heading down we will keep a close eye on it and take action if required.

Condition 14 – Heavy metals

Heavy Metal Sampling of Treated Wastewater

Date Sampled	Arsenic (µg/L)	Chromium (µg/L)	Copper (µg/L)	Nickel (µg/L)	Zinc (µg/L)
6/01/2025	0.0013	0.001	0.0073	0.0026	0.056
11/01/2024	1	1	8.98	1.2	51
6/01/2023	1	1	6.6	1.3	28
12/01/2022	1	1	8.6	94	2
6/01/2021	2.2	1	12	74	1.6



Heavy metal samples are trending downwards over time.

Guideline values for heavy metals - ANZECC & ARMCANZ (2000)

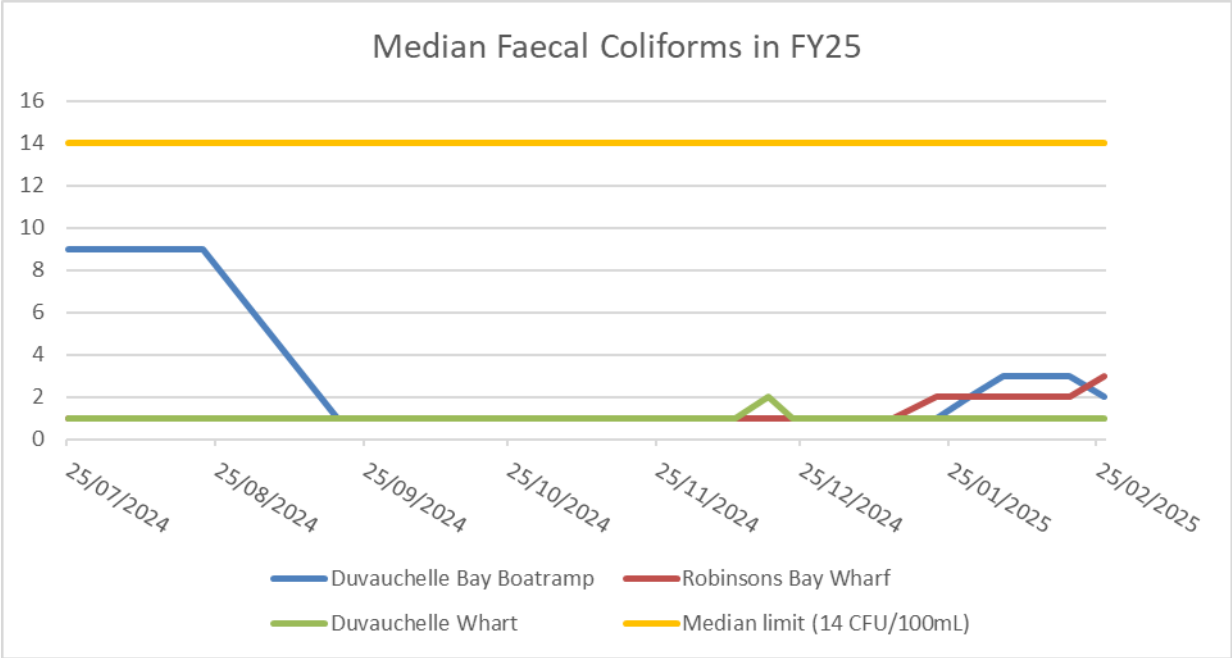
Heavy metal	Publish Date	Level of species protection	µg/L	Medium
Arsenic (AsIII)	2000	95%	24	Freshwater
Arsenic (AsV)	2000	95%	13	Freshwater
Chromium (CrIII)	2000	95%	27	Marine water
Chromium (CrVI)	2000	95%	4.4	Marine water
Copper	2000	95%	1.3	Marine water
Nickel	2000	95%	70	Marine water
Zinc	2021	95%	8.0	Marine water

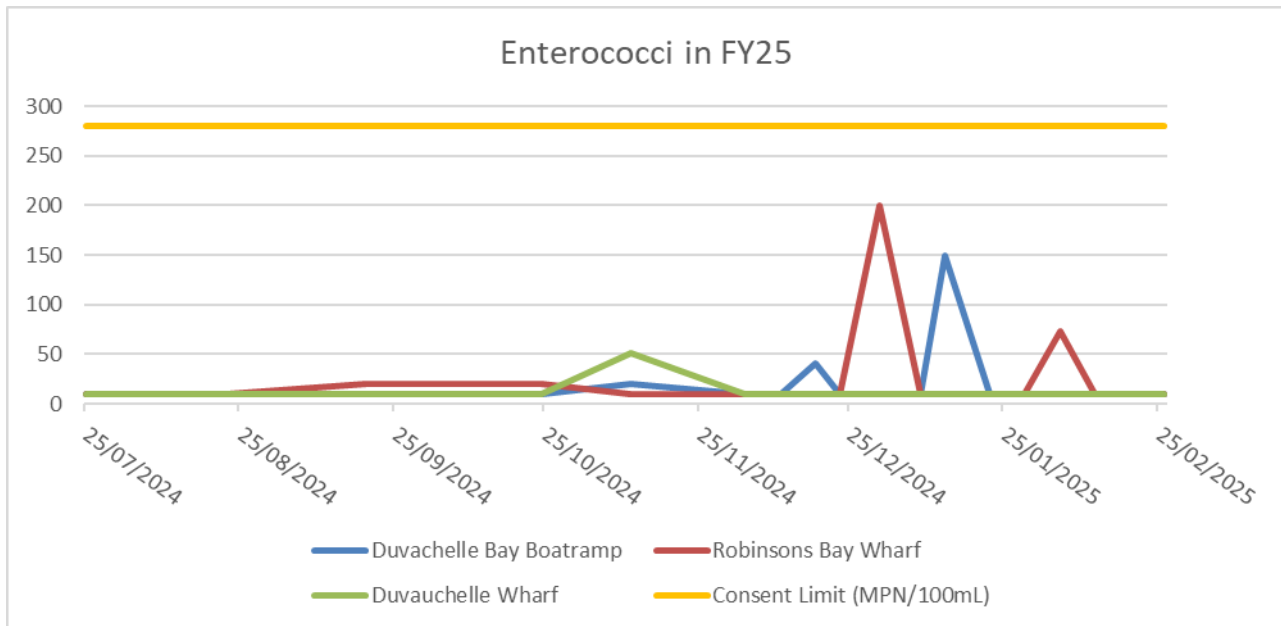
It is not possible to derive DGVs that would be appropriately applicable to all estuarine waters all the time. Estuaries are typically brackish. In addition to the lack of relevant ecotoxicological data, estuarine systems are highly variable and dynamic, especially in relation to their salinity and turbidity.

The heavy metal samples taken at the Duvauchelle WWTP are also measured at the point of discharge before the outfall. These samples do not consider the dilution factor which applies once the WWTP discharge enters the estuarine environment.

Condition 22d *An interpretation of the monitoring results in relation to the effects of the discharge on the environment,*

The water of the receiving environment is sampled in three locations, weekly between 1 December and the last day of February, and monthly from 1 March to 30 November. These samples are analysed for faecal coliforms and enterococci concentrations. All samples collected within the period of 1 December to the last day of February each year, are further analysed to check that the concentration of faecal coliforms does not exceed a rolling median of 14 CFU per 100 millilitres based on the previous five samples. There were 0 exceedances of the standard consent limit in FY25





There were no exceedances of the rolling median of 14 CFU per 100 millilitres based on the previous five samples, during the summer period.

There were also no single sample exceeding 280 enterococci per 100 millilitres.

Condition 22e *Summary of what measures the Consent Holder has implemented or will implement to mitigate any adverse environmental effects as a result of the exceedances of any trigger values and to prevent a reoccurrence.*

After the end of FY24, we implemented an upgrade to the UV control system, which has reduced levels of Enterococci in the treated wastewater.

Condition 22g *Details of any outfall monitoring undertaken in the reporting period, required under Condition 19 (outfall pipe condition inspection)*

Outfall monitoring is set out to be undertaken every 2 years after the commencement of this consent. The next outfall monitoring is due to occur in July 2025. At the last monitoring carried out in 2023, it was not possible to find the outfall pipe as it is fully buried by sand. We would like to discuss the best way forward to address this with ECAN.