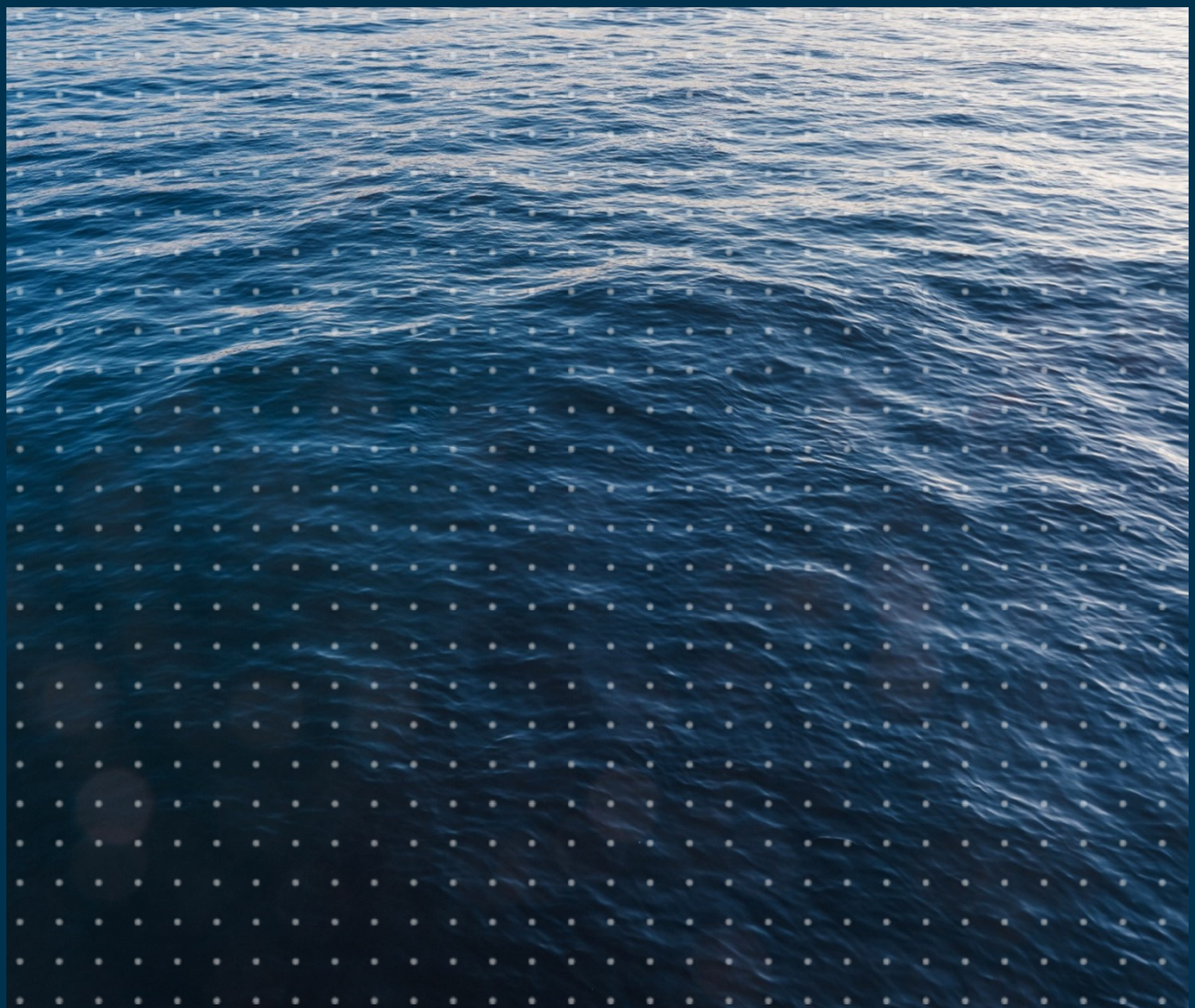
Environment Protection Authority

Hunter River Salinity Trading Scheme 2020–21 Performance



More information about the Hunter River Salinity Trading Scheme

Further information on the operation of the Scheme can be obtained online from the EPA at www.epa.nsw.gov.au/licensing/hrsts/ and from WaterNSW at https://realtimedata.waternsw.com.au/

Follow the links from these webpages for information on river flow and EC (electrical conductivity) conditions in the Hunter River.

For more information on the operations of the Scheme, telephone 131 555 or email info@epa.nsw.gov.au.

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What is the Hunter River Salinity Trading Scheme?

The Hunter River Salinity Trading Scheme (the Scheme) involves a finite system of salt credits that industries can buy and trade to discharge their salty water into the Hunter River. Discharges are only permitted when the river contains adequate fresh water to dilute the salt and maintain water quality. The Scheme therefore balances the amount of salt that industry can directly discharge with the background level of salt in the river.

River flow is measured at a series of monitoring points along the river. When flows are low, no discharges are allowed. During periods of high flow, limited discharges can occur, but only if the person discharging has sufficient salt credits. When flood flows occur, discharges are allowed up to an agreed salinity target.

Salinity is measured by determining the electrical conductivity (EC) of water within the river. EC estimates the amount of total dissolved salts in the river and is measured in microsiemens per centimetre (µS/cm). Sea water has an EC of around 55,000µS/cm. Drinking-quality water can range between 600µS/cm and 1200µS/cm.

The Scheme is operated by WaterNSW under a service agreement with the NSW Environment Protection Authority (EPA) and is guided by the Hunter River Salinity Trading Scheme Operations Committee. The committee includes representatives from industry, irrigators, the community and a committee member to represent the interests of the environment and the NSW Government. The river is divided into three sectors for the purposes of the Scheme, with specific salinity targets set for each sector.

What is the purpose of the Scheme?

The Scheme has been designed to balance the water quality objectives of the Hunter River with the water quality needs of agricultural users and the discharge needs of mines and power stations within the Hunter River catchment.

Overall, salinity is kept to an appropriate level by only allowing discharges during high flow or flood events and balancing the amount of salt that industry can discharge against the background salt levels in the river.

The river naturally contains high levels of salt due to weathering of the geological strata, surface water run-off and infiltration, saline groundwater inflows and a range of anthropogenic sources, which include agricultural practices and mining and power generation.

The Scheme monitors salt levels in the river to ensure that mines and power stations only discharge when salinity levels are appropriately low. By balancing the amount of salt that can discharge against background salt levels in the river, the Scheme helps to manage the impact of these discharges on the health of the river, and ensures that the water is suitable for local primary producers to use for irrigation purposes.

How did the Scheme perform during 2020–21?

During the 2020–21 financial year, the Hunter River catchment received higher rainfall when compared to recent years, resulting in high flows and allowing the Scheme to safely discharge salty water into the Hunter River.

Five discharge periods (known as blocks) were activated in 2020–21, providing 63 discharge opportunities for various industries, with 28 discharge opportunities for the Upper sector, 15 for the Middle sector and 20 for the Lower sector.

In total, there were 98 individual discharge events of saline water from across eight industry sources into the river in 2020–21, within the 63 discharge opportunities.

The breakdown per sector was as follows:

1. There were 28 opportunities for industries in the Upper sector to discharge within the following timeframes: 30 July–2 August 2020; 20 October; 29–31 October 2020; 7–11 January 2021; 22–30 March 2021; 13–16 June 2021; 28 June 2021.
2. There were 15 opportunities for industries in the Middle sector to discharge within the following timeframes: 30 July–3 August 2020; 20 October; 29 October–4 November; 25–27 December 2020; 6–12 January 2021; 20 March–3 April 2021; 13–16 June 2021; 28 June 2021.
3. There were 20 opportunities for industries in the Lower sector to discharge within the following timeframes: 29 July–5 August 2020; 14–16 August; 20 October; 29 October–5 November; 25–27 December 2020; 1–14 January 2021; 16 March; 20 March–6 April 2021; 13–17 June 2021; 28 June 2021.

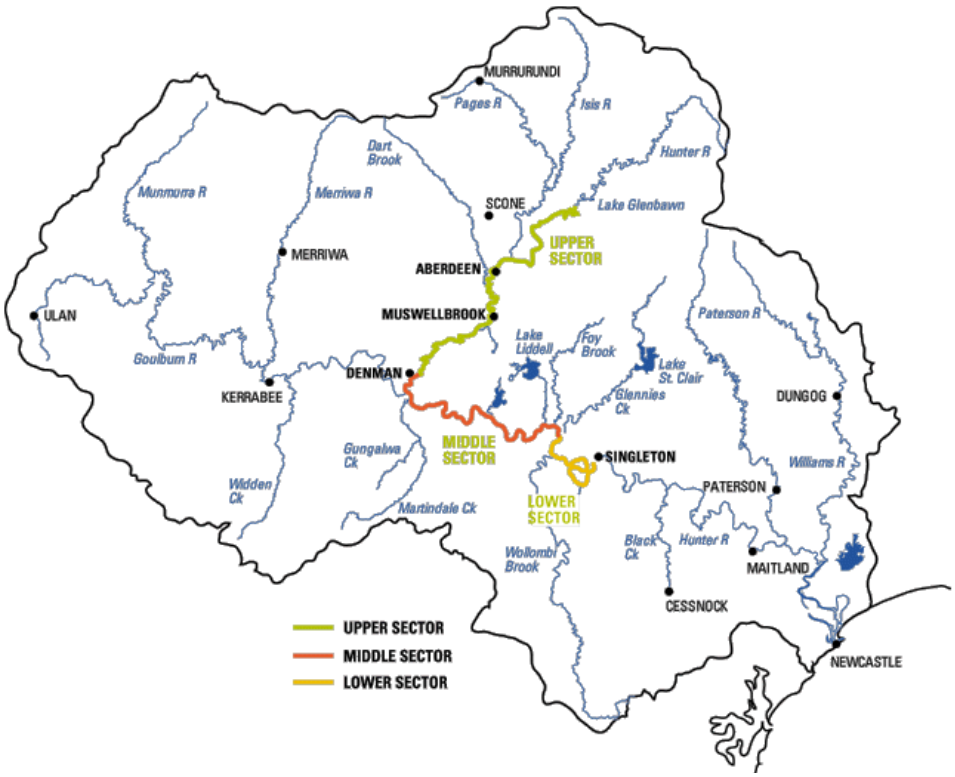

Figure 1 Hunter River sectors

During periods of low flow, salinity generally increases in the Hunter River, as the graphs below show. This is a result of a range of factors as outlined above, coupled with less dilution and therefore higher concentrations of salt. Conversely, during periods of high flow, salinity generally decreases.

How did the Scheme perform during industry discharge events?

A total of 10,000 tonnes of salt were discharged to the Hunter River by Scheme participants during high flows, representing 7% of the Total Allowable Discharge (TAD) of salt per year, and 18% of the total salt load carried by the river past Singleton during 2020–21. Eight participants took advantage of discharge opportunities. The calculated TAD (i.e. without flood flows) was 151,900 tonnes. The average daily salinity in the river over the 2020–21 period was 650µ/cm at Denman; 855µS/cm at upstream Glennies Creek; and 742µS/cm at Singleton.

Below is a summary of salinity and flow information in the Upper, Middle and Lower sectors of the river over the year. Salinity results are compared with the established salinity targets that have been set for the three sectors of the river.

Upper sector: Hunter River upstream of Denman

The salinity target for the Upper sector is 600µS/cm during high flows (shown in Figure 2, below, as a pink line) and 900µS/cm during flood flows (shown in Figure 2, below, as a red line). The Upper sector has two targets due to its position in the upper catchment where water quality is generally better because it has received less diffuse and direct discharges than the Middle and Lower sectors. This helps to ensure that the final water quality in respect of salinity is maintained throughout the Hunter River.

During 2020–21, the Upper sector achieved 100% compliance with its high flow salinity goal of 600µS/cm and flood flow salinity goal of 900µS/cm during allowed discharge periods.

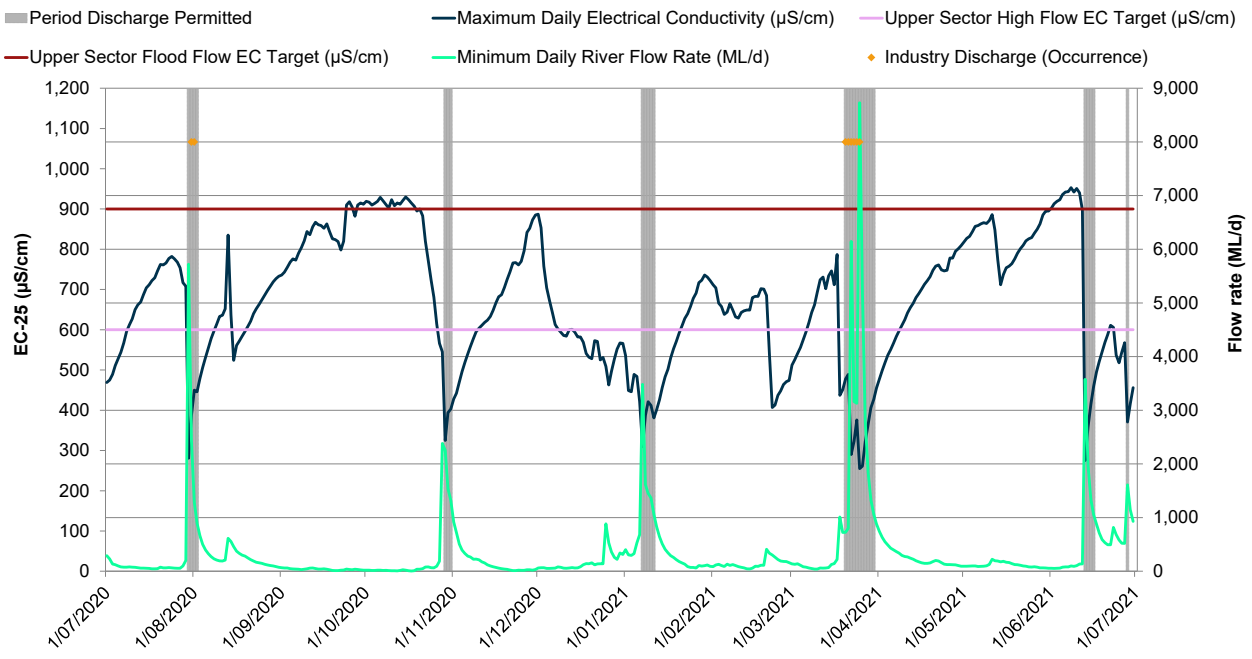

Figure 2 Maximum salinity and minimum flow: Hunter River at Denman

In total, there were 28 periods during the year when mines in the Upper sector were allowed to discharge salty water. During the discharge periods in August 2020 and in March 2021, only one mine used its credits to discharge. During these discharge periods the EC in the river remained well below the high flow salinity target, ensuring that the water was suitable for local irrigation.

Middle sector: From Denman to the junction of the Hunter River and Glennies Creek

The salinity target for the Middle sector is 900µS/cm for both high flows and flood flows (shown in Figure 3, below, as a red line).

Spikes in EC occurred when river flows in Denman dropped from 1000ML/d to under 450ML/d. The contributing factors included concentration of salt due to lower flows, potential inputs from surface water run-off and infiltration, and saline groundwater inflows.

The drop in EC in early April 2021 occurred as flows in Denman increased from previous 250ML/d to over 5000ML/d.

Spikes in EC are not only due to direct contributions from surface water run-off and groundwater inflows but also inflows from tributaries such as the Goulburn and Wybong rivers. These rivers have saline catchments that contribute water with high EC when flows in the Hunter River drop substantially.

The drop in EC in early April 2021 occurred as flows through Denman increased from 250ML/d to over 500ML/d.

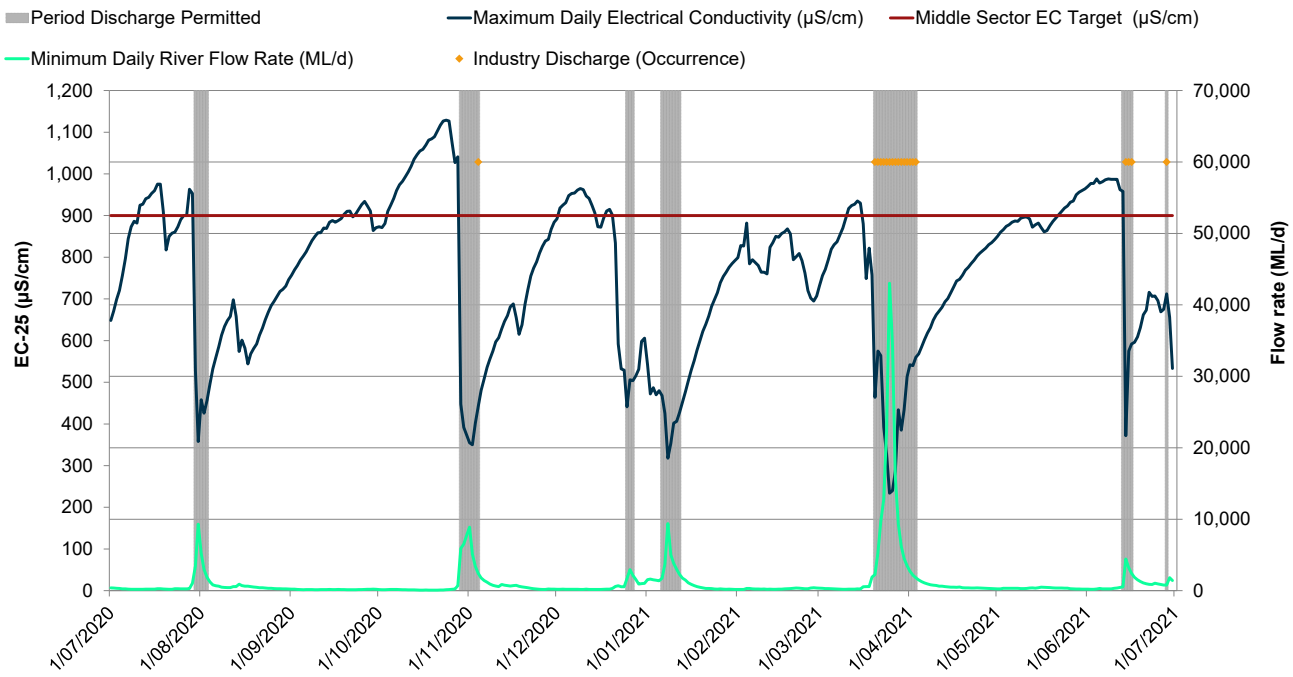

Figure 3 Maximum salinity and minimum flow: Hunter River upstream of Glennies Creek

Lower sector: From the junction of the Hunter River and Glennies Creek to Singleton

The salinity target for the Lower sector is 900µS/cm for both high flows and flood flows (shown in Figure 4, below, as a red line).

As with the Middle sector, spikes in EC correlate to the concentration of salt due to lower flows, potential inputs from surface water run-off, infiltration, saline groundwater inflows and other tributaries.

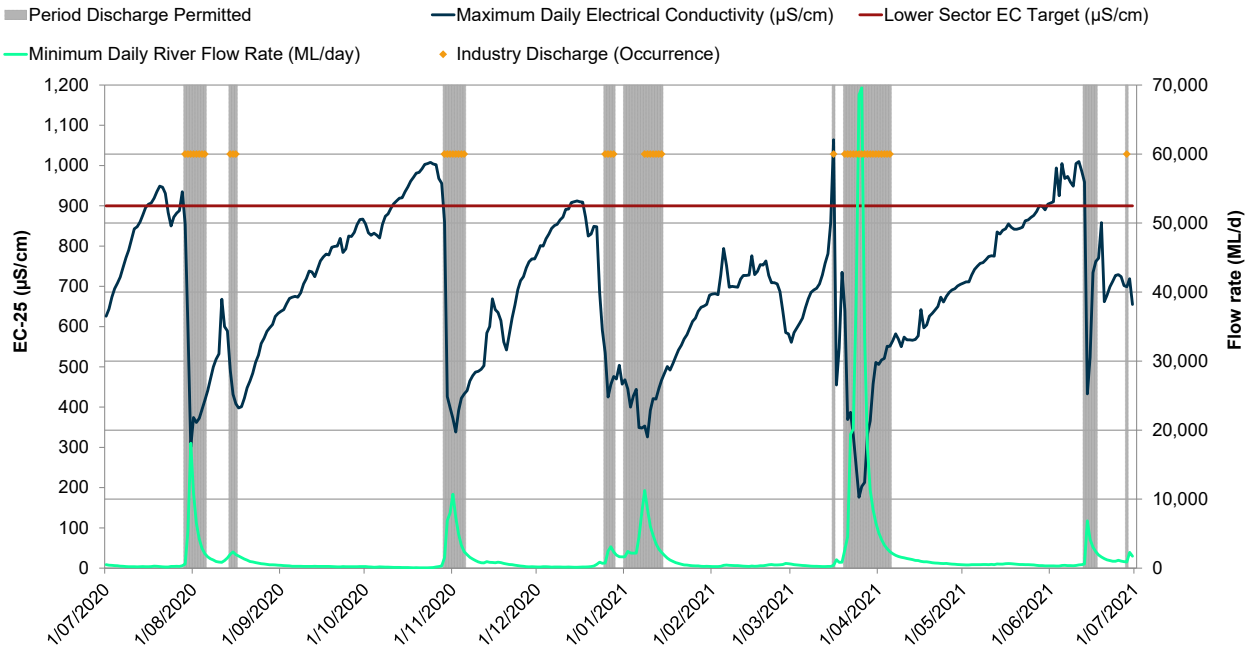

Figure 4 Maximum salinity and minimum flow: Hunter River at Singleton

Scheme discharge as a proportion of the total allowable discharge and salt load passing through Singleton

The total salt load passing through Singleton during 2020–21 was 55,100 tonnes. Figure 5 (below) shows the total allowable discharge as 151,900 tonnes in the green column, and total discharge by industry as 10,000 tonnes in navy blue column.

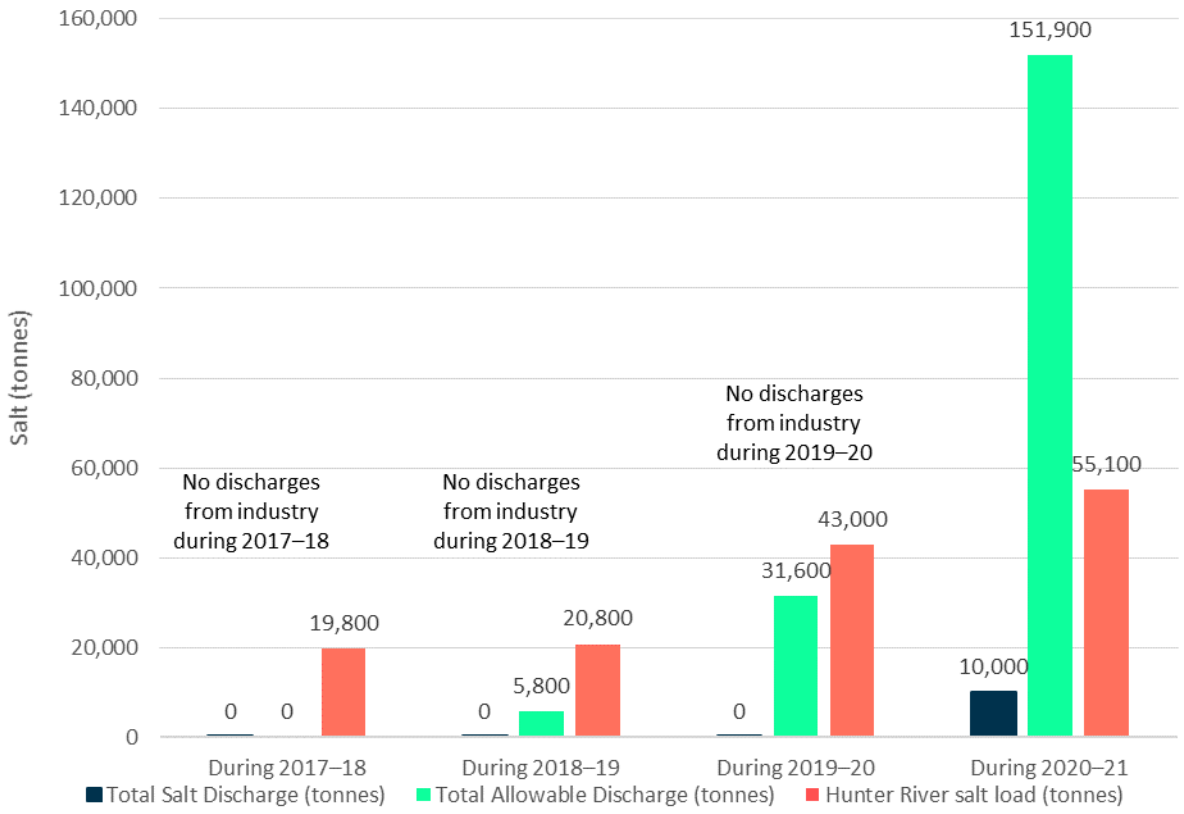

Figure 5 Industry discharge compared with total allowable discharge and total salt load passing through Singleton during 2020–21

Further information

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