





Upper Darling Salt Interception Scheme

A Joint Works project under the Murray-Darling Basin ministerial Council's Basin Salinity Management Strategy 2001–2015. The scheme will prevent around 16,500 Tonnes of salt from entering the Darling River annually and thus reducing downstream salinities.

UPPER DARLING – IN CONTEXT

The Upper Darling area associated with the Salt Interception Scheme is located on the eastern bank of the Daring River approximately 30 km southwest of Bourke.

Knowledge that saline groundwater flows into the Darling River system has been around for many years. As early as 1829, Charles Sturt had commented on the arrangement of fresh and saline groundwater seepage on the banks of the Darling River. Since then it has been considered that saline groundwater inflow contributes to the Darling River salinity.



Headworks for No. 1 Bore



Weir No. 19A on the Darling River adjacent to Bore No. 1

In addition regular surveys of the salinity in the Darling River over a number of years have indicated that there are significant salt accession to the River immediately downstream of Weir 19A. This saline groundwater is contained in an ancient buried river channel that drains the Darling River Basin.

Salt accumulated over the upper catchments have been transported into the aquifers of Bourke graben (geological fault) by the regional groundwater flow. The saline inflows to the Darling River are being fed by a regional upward movement of groundwater that is being directed by the damming effect of a below surface rock barrier known as the Yanda ridge.

The NSW Government through the Office of Water developed a number of possible solutions to address the problem. Intercepting the saline water with a "curtain" of pumped groundwater bores was considered by far the most cost effective solution to the problem.

Upper Darling Salt Interception Scheme



The \$6.5 m salt interception scheme is designed to intercept saline groundwater in the shallow aquifers (20 to 30 metres) currently entering the Darling River and is located near the western edge of the geological fault where the Yanda ridge forms a subsurface barrier to aquifer flow across the outlet of the fault.

The scheme consists of five production bores located along the southern bank of the Darling River. Each production bore is equipped with an electrically operated stainless steel submersible pump with nominal pumping rates varying from about 10–20 L/sec.

BENEFITS GAINED BY THIS SCHEME

Through the implementation of this scheme the reduction of in-river salt load provides a more stable environment for aquatic ecosystems. This is particularly relevant for the downstream wetland systems which provide a critical habitat for many fish and vegetation species. A broader community benefit is through improved urban water quality for downstream users (particularly Broken Hill water supply) and salinity offsets for irrigation agriculture.

These benefits are also seen in the River Murray where the operational scheme will see a salinity reduction of 3.54 EC at Morgan in South Australia.







Construction of the enhanced leakage pit.

WHAT HAPPENS TO THIS SALINE GROUNDWATER?

The intercepted groundwater, which is typically around 35,000 EC, is disposed of via a pipeline to a constructed basin complex approximately 9 kilometres south-east of the production bores. (an EC unit is a measure of salinity concentration with seawater at around 50,000 EC)

The disposal basin complex, which is approximately 50 ha in size, is divided into two main bays which are interconnected by pipes with control structures to direct the passage of flow from one bay to another. Evaporation of this water will result in the concentration of the brine in these bays. Brine from the final bay is transferred to the enhanced leakage pit from which it leaks directly to the bottom of the deep sandy aquifer.

SCHEME STATISTICS

The Scheme is the first and only Salt Interception Scheme built on the Darling River

- The scheme consists of 17km of HDPE pipes of varying sizes from 200 to 400 mm diameter pipes.
- The scheme has 5 submersible pump stations
- On average the scheme delivers 1800ML per year to the disposal basin.
- Average salinity of the groundwater extracted is 35,000 EC
- The scheme pumps approximately 40,000 tonnes of salt per year to the disposal basin.
- The scheme cost \$6.5M to construct
- Predicted EC benefit of the scheme is 3.54 EC at Morgan.



THE BASIN SALINITY MANAGEMENT STRATEGY 2001–2015

The Basin Salinity Management strategy 2001–2015 is the Murray-Darling Basin Ministerial Council's response to the threats of salinity to water quality, environmental values, regional infrastructure and productive agricultural land. The Strategy sets out how Basin Communities and Governments work together to control salinity and protect important assets and environmental values.

A key element of the Strategy was the implementation of a joint works program to offset a predicted 61EC future increase in average salinity at Morgan. Since the Strategy came into effect, the partner governments of New south Wales, Victoria, South Australia and the Australian Government have, initially through the Murray-Darling Basin Commission and more recently the Murray-Darling Basin Authority, invested in the construction, operation and maintenance of salt interception and drainage disposal schemes to meet the salinity targets of the strategy, therefore protecting the River Murray from the impact of rising salinity.

Further Information

The Murray-Darling Basin Authority Phone: 02 6279 0100

For further information on salinity or Salt Interception Schemes, visit the Murray-Darling Basin website: www.mdba.gov.au

NSW Office of Water Phone: 03 5051 6223

Funded by the New South Wales, Victorian, South Australian and Australian Governments through the Murray-Darling Basin Authority

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