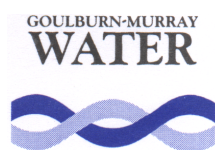


NORTH-EAST SALINITY STRATEGY SURFACE WATER SALINITY OVENS CATCHMENTS - 2000



Goulburn - Murray Water

August 2001



SINCLAIR KNIGHT MERZ

Contents

| | |
|---|-----------|
| 1. Introduction | 1 |
| 2. Catchment Information..... | 2 |
| 2.1 Ovens River..... | 2 |
| 2.2 Three Mile Creek | 2 |
| 2.3 Black Dog Creek..... | 2 |
| 2.4 Indigo Creek..... | 3 |
| 3. Data Availability | 5 |
| 3.1 Data Availability | 5 |
| 3.2 Proposed Monitoring..... | 5 |
| 3.3 Current Data Collation | 5 |
| 4. Flow and Salinity Statistics..... | 7 |
| 4.1 Statistics explained | 7 |
| 4.2 Flow Statistics..... | 8 |
| 4.3 Salinity Statistics..... | 8 |
| 4.4 Salt Loads | 11 |
| 5. Conclusions | 12 |
| 6. Recommendations..... | 13 |
| Appendix A Raw Data Plots..... | 14 |
| Appendix B Missing Data | 27 |
| Appendix C Estimated Data..... | 28 |
| Appendix D Infilling Techniques..... | 29 |

Document History and Status

| Issue | Rev. | Issued To | Qty | Date | Reviewed | Approved |
|-------|------|--------------------|-------------------|---------|-------------|------------|
| Draft | 0 | P Dickinson (G-MW) | 1 | 26/6/01 | N Kelleher | P Erlanger |
| Final | 0 | P Dickinson (G-MW) | 3 hard 1 elec | 31/8/01 | D Delahunty | P Erlanger |
| Final | 0 | P Ockenden (NRE) | 30 hard 1 elec | 31/8/01 | D Delahunty | P Erlanger |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Printed: 4 October, 2001
Last Saved: 27 June, 2001
File Name: I:\WCMS\Wc00840\00_01\Rep01_01.00\D03dvdne(Final).Doc
Project Manager: Dean Delahunty
Name of Organisation: Goulburn-Murray Water
Name of Project: North-East Salinity Strategy
Surface Water Salinity
Name of Document: Ovens Catchments
Document Version: Final
Project Number: WC00840

1. Introduction

This report provides a review of the surface water salinity data collected at four sites in the Ovens Basin for the 2000 calendar year. A brief analysis of the data is also included.

This report contains :

- ❑ An assessment of the usefulness and accuracy of information provided by the monitoring sites, with recommendations where appropriate.
- ❑ A schedule of missing data for all sites.
- ❑ Basic flow, salinity and salt load statistics for each site.
- ❑ Time series graphs for flow and salinity for each site.
- ❑ An evaluation of graphs and statistics for possible faulty data.

This brief annual review is essential to ensure the integrity of the monitoring program, and is a precursor to any full analysis of data from these monitoring sites. The collation of additional catchment data such as area, land-use and climate information will assist in the long-term understanding of salinity characteristics in these catchments. It is envisaged that this project will, over this initial stage of salinity strategy implementation, develop and document the information required for assessing the impact of salinity both within the region and in the wider context of the Murray Darling Basin.

2. Catchment Information

The Ovens catchments (shown in Figure 2.1) cover an area of approximately 36,500 ha and are recognised as contributing approximately 14% of the total volume of water to the Murray Darling Basin system (NESWG, 1997). The four continuous flow and salinity monitoring sites that have been reviewed in this report are located in the lower reaches of the Ovens catchments. The purpose of these sites is to record the salinity of these streams over time and to assist in the assessment of dryland salinity impacts. Dryland salinity due to rising water tables in the floodplains is a recognised factor in the decline of water quality in the lower part of catchment, particularly to the foothills regions. There is a large quantity of information available regarding salt discharge sites in the Ovens Basin. An example of this is the Everton Upper area where work is currently being undertaken to remediate a discharge site. The valley where the salt discharge is occurring does not flow as a stream but would naturally drain to the Ovens River during wetter weather. There is potential to collate information to link washoff of salt from these areas, which can be measured by the stream gauge, with particular weather sequences.

Additional information on catchment characteristics will be developed during the initial stages of Salinity Strategy implementation as stream flow and salinity data is gathered. It may then be possible to use the stream flow and salinity data to assess the salinity behaviour of the catchments. The current available information about each of the catchments is summarised below.

2.1 Ovens River

The Ovens River drains from the northern side of the Great Dividing Range and discharges to the River Murray upstream of Yarrawonga. The Ovens River monitoring site that is being assessed in this report is located at Peechelba. This site is being used by the Murray Darling Basin Commission for spot flow measurements and flood forecasting.

It should be noted that although there is also a flow monitoring site upstream of Peechelba at Wangaratta (Site 403242) the site does not capture any flows from the Fifteen Mile Creek system which flows into the Ovens River downstream of Wangaratta (Refer to Figure 2.1). The Peechelba site was chosen to best represent the salt load reaching the River Murray from the entire Ovens River catchment.

2.2 Three Mile Creek

The Three Mile Creek drains the area west of the King River and includes the combined flows from the Fifteen Mile and One Mile Creeks. The Creek passes through the city of Wangaratta and discharges to the Ovens River downstream of the town. The upstream catchment terrain is generally flat (Riverine plain) and extensively cleared. There are a number of known salt discharge sites in the upper catchment. Runoff in the lower parts of the catchment includes town stormwater runoff and is also influenced by industrial effluent discharges to the creek.

2.3 Black Dog Creek

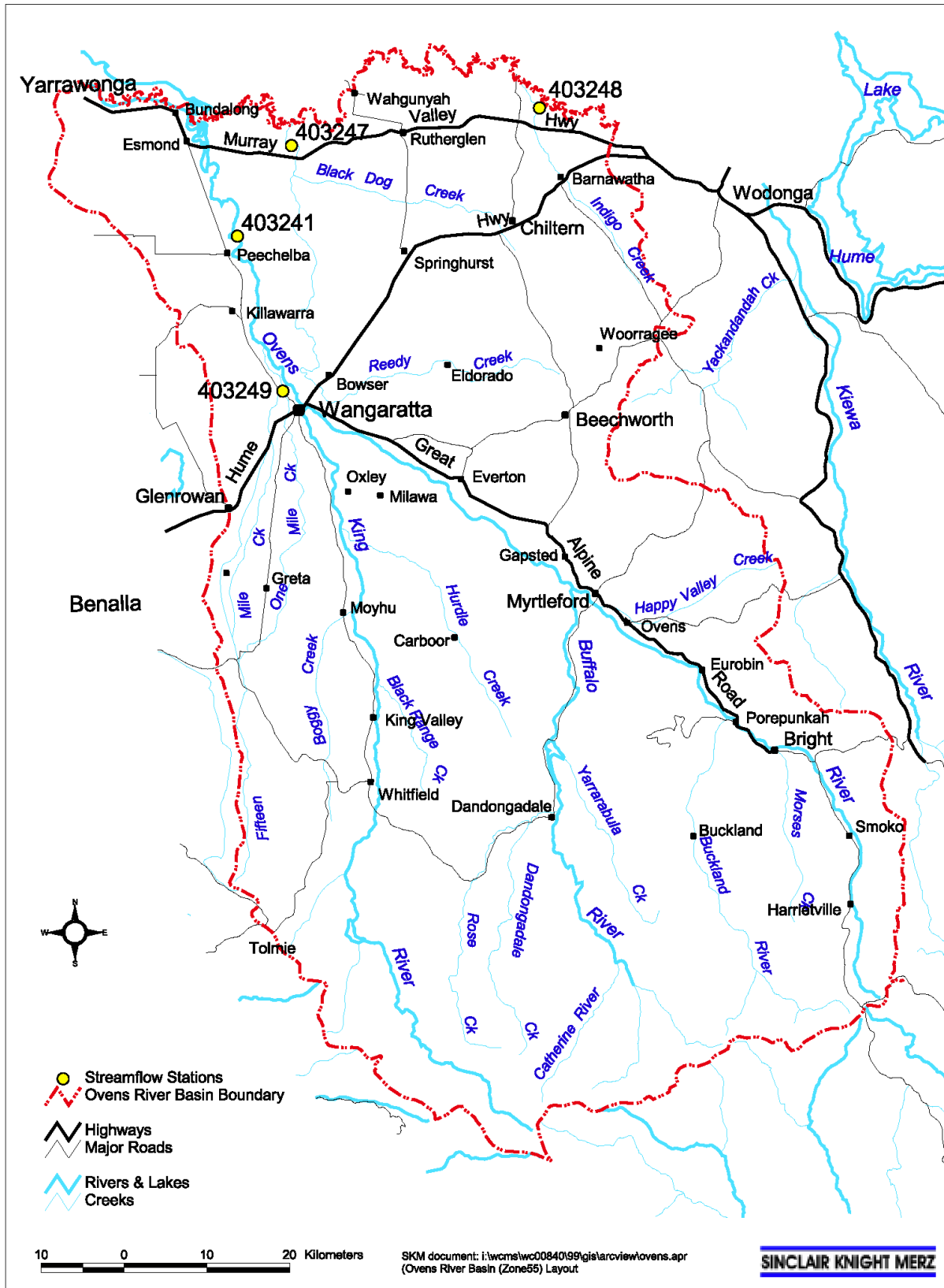
Black Dog Creek originates near Chiltern and flows across the Riverine Plains to the River Murray. The catchment is mainly cleared and although there is some steeper

terrain in the upper reaches, the significant land management unit is Riverine Plain Upper Terrace. There are a significant number of noted salt discharge sites in the catchment (NESWG, 1997), particularly in the Springhurst Hills area. The catchment includes a large area on the Riverine Plain (in the Reedy Creek area near Wangaratta) where surface water can pond and will not necessarily always discharge to the Black Dog Creek system. This may mean that flow and salinity data exhibit very different characteristics during wetter climatic periods. Further investigation and documentation could allow catchment boundaries for both low flow and flood flows to be more clearly defined.

2.4 Indigo Creek

The Indigo Creek originates amongst some steep terrain north of Yackandandah and flows across the Riverine Plain Upper Terrace to the River Murray. The catchment is mainly cleared and has been identified as having a significant number of salt discharge sites (NESWG, 1997). The discharge sites are concentrated in the middle reaches of the catchment where there is a transition from the steeper terrain to the Riverine Plains.

■ Figure 2-1 Locality Plan



3. Data Availability

3.1 Data Availability

This report covers four hydrographic monitoring sites for the 2000 calendar year, as listed in Table 3.1 below. The table shows the total extent of data available at the sites. The North-East data collection program began in the latter part of 1998 and all data has been examined for completeness and integrity.

■ **Table 3.1: Data Available**

| Station | Number | Parameter | Frequency | Start Date | End Date |
|-------------------------|--------|-----------|------------|------------|----------|
| Ovens River @ Peechelba | 403241 | Flow | Continuous | 22/9/1998 | Ongoing |
| | | Salinity | Continuous | 22/9/1998 | Ongoing |
| Black Dog Creek | 403247 | Flow | Continuous | 22/8/1998 | Ongoing |
| | | Salinity | Continuous | 22/8/1998 | Ongoing |
| Indigo Creek | 403248 | Flow | Continuous | 24/6/1999 | Ongoing |
| | | Salinity | Continuous | 24/6/1999 | Ongoing |
| Three Mile Creek | 403249 | Flow | Continuous | 2/6/2000 | Ongoing |
| | | Salinity | Continuous | 2/6/2000 | Ongoing |

3.2 Proposed Monitoring

One of the recommendations of the Draft North East Salinity Strategy (NESWG, 1997) was that new flow and water quality monitoring sites should be established at a number of nominated locations within the Ovens Basin. The final location nominated for monitoring, which has not yet been established, is the Buffalo River near the Ovens River junction. It was also recommended that water quality monitoring should be re-established on the Ovens River at Wangaratta and Reedy Creek in Wangaratta North. These are yet to be established although flow is currently monitored at these two sites.

Funding is yet to be made available for nutrient monitoring at any of the existing monitoring sites.

3.3 Current Data Collation

Overall the data collected during 2000 was of a good quality.

There were 186 days for which the quality code for flow was higher than 3 and 10 days where the salinity code was greater than 3. Full details of missing data have been included in Appendix B and details of estimated data with an explanation of quality codes is included in Appendix C.

A summary of the significant data collection problems is presented below.

- Backup caused by a downstream influence was the most significant cause for missing data. This accounts for 112 days at the 3 Mile Creek, Indigo Creek and Black Dog Creek sites. The cause of the backup is attributed to the higher flows in both the Owens River and River Murray at these times. Backup is generally detected when the rating is different on the rising limb of a hydrograph peak to the falling limb.
- Flow data was extrapolated at the Indigo Creek site due to insufficient gauging (Code 150). Although the flow has been estimated, use of this figure in any detailed studies should be treated with caution. This missing data code is to be expected with new sites as flows beyond the range of the available rating occur. The accuracy of high flow data is expected to improve with additional stages measured by Thiess.
- Some minor editing of the flow and salinity data was undertaken by Thiess.