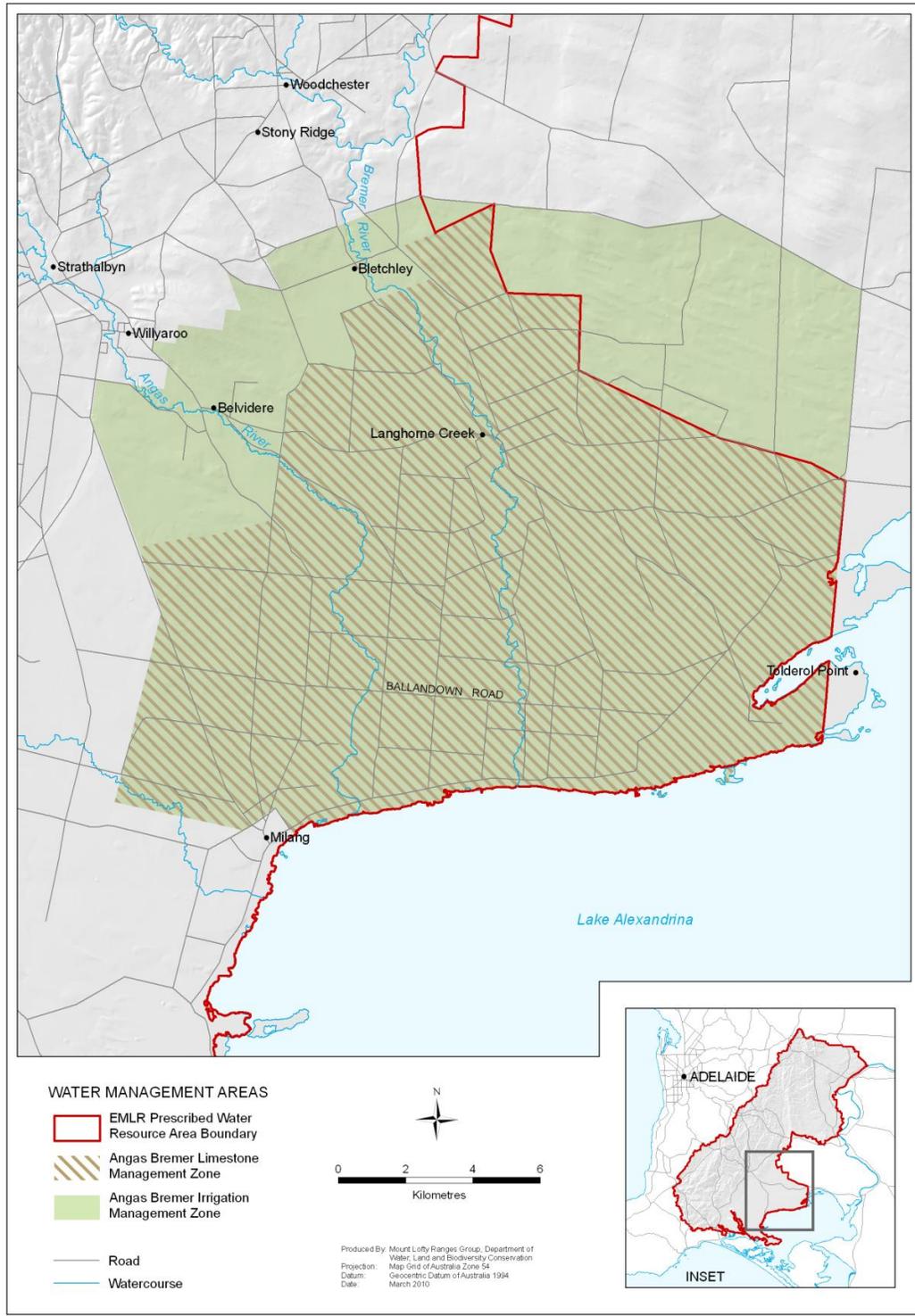


A Code of Practice for Sustainably Managing Irrigation in the Angas Bremer Irrigation Management Zone

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Map 1: Angas Bremer Limestone Management Zone and Angas Bremer Irrigation Management Zone.

Irrigation Efficiency

What? – Irrigators must aim to use their irrigation water in a sustainable manner using Best Practice Methodology.

Why? – Efficient irrigation will minimize the volume of water draining into the groundwater and reduce the risk of waterlogging and soil salinisation, however, some drainage beyond the rootzone is necessary to flush out accumulated salt and reduce plant stress and loss of production. Efficient irrigation also has the added benefit of minimizing impacts on precious water resources.

When? – At least record the total amount of water used for irrigation at the end of each irrigation year and the date of the first and last irrigations for the season. Preferably also record after every irrigation the amount of water applied and how much drained below the rootzone in at least one location within your major crop.

How? –

Record :

- Meter readings and the total amount of water used for irrigation over the year, including volume applied to each crop type where relevant
- The salinity of the irrigation water
- The date of first irrigation and last irrigation over the season
- If also measuring at each irrigation and using a FullStop device or similar –the amount of water applied per irrigation and the volume of water sampled from below the rootzone (1m depth) either prior to the next irrigation or once per week, and the salinity of the water sample below the rootzone.

Winter leaching: Winter leaching to complement rainfall appears to be the most efficient way of achieving drainage below the rootzone to flush accumulated salt from the soil.

Groundwater Monitoring

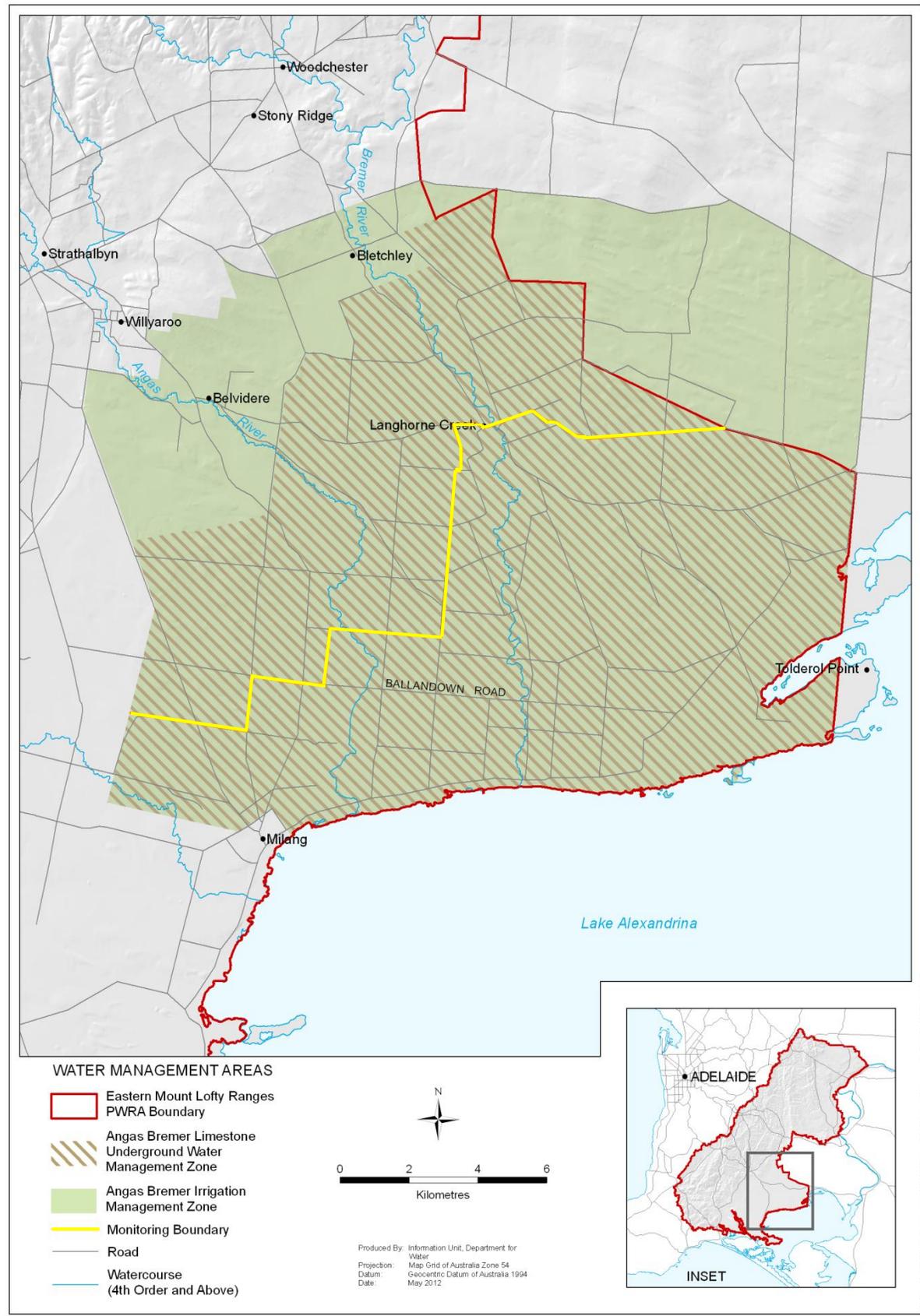
What? – Monitoring of groundwater on irrigated land south of the yellow line in Map 2.

Why? – To detect any changes in groundwater levels as this may indicate an increased risk of waterlogging and/or soil salinisation.

When? – Quarterly in September, December, March and June each year.

Where? – In groundwater wells located either within, or as close as practicable to, the area to be irrigated on each property situated south of the yellow line in Map 2. If you have more than 500 ML on licence (River Murray, Groundwater and Surface Water combined¹) you need at least two groundwater monitoring wells.

How? – Measure the depth to groundwater in a 6m deep test well. The measurement required is from the top of the steel casing to the water level or to the bottom of the well (if dry). Record the well number, the date and the depth to groundwater.



Map 2: Angas Bremer Limestone Underground Water Management Zone (equivalent to the Angas Bremer Prescribed Wells Area) and Irrigation Management Zone. Watertable monitoring wells are only required south of the yellow line.

Vegetation planting and management

What and when? – For every 100 ML of water on licence¹, 2 hectares of deep-rooted, non-irrigated perennial vegetation needs to be planted and nurtured on *relevant land*² in accordance with the Angas Bremer Irrigation Region Revegetation Booklet. This is on a pro-rata basis, for example, 110 ML will need 2.2 ha or 25 ML will need 0.5 ha. Existing vegetation can be counted for water on allocation prior to 2 January 2001 but new vegetation must be planted for new allocations or transfers after 2 January 2001. Preferably a diverse range of native plants of local origin should be planted. The vegetation should be maintained in good health and invasive species such as weeds and rabbits controlled. Those irrigators with River Redgums on their property are also asked to report on the general health of the trees and possible reasons for any observed changes in tree health.

Why? – Deep-rooted plants have the potential to intercept rainfall and excess irrigation water before it reaches the groundwater. Some plants can also access groundwater directly and will help to manage shallow regional groundwater levels. The addition of local native plants and weed and rabbit control will also increase the biodiversity value of the property (e.g. encourage bird life) and improve ecosystem health. The reintroduction and maintenance of biodiversity is also a reporting indicator for the Wine Maker's Federation Environmental Assurance Program, Entwine.

Where? – Within the Angas Bremer Irrigation Management Zone (see Map 1). Future plantings should be located on *relevant land* where there is a high risk of rising shallow watertables, unless it can be demonstrated it is not practical to do so, in which case it is preferable to establish or manage vegetation on, or as close as possible to, the irrigated areas.

How? – New vegetation must be established in accordance with the Eastern Mt Lofty Ranges Water Allocation Plan and the Angas Bremer Land and Water Management Plan. In general, the distance between plants should not exceed 10m. Plantings not fitting these guidelines need to be assessed by the Angas Bremer Water Management Committee (ABWMC).

The area covered by vegetation can be measure directly in the field or by using aerial photographs.

The area covered by single lines of trees can be calculated by multiplying the length of the tree line (include 5m either side of the first and last plants) by 10m (the assumed width of mature trees regardless of the species planted) to give an answer in square metres. $\text{Area} = (\text{Length of row} + 10) \times 10$

¹ The requirement for an increase in the number of hectares of revegetation and/or installation of another monitoring well for existing licence holders after the addition of Surface Water allocations to water licences will not apply where:

- a) the water to be allocated would be applied to an area that is already the subject of an existing allocation (or allocations) that is considered by the Minister to be sufficient to meet the water requirements of the purpose of use; and
- b) the revegetation and monitoring well requirements have already been met, or will be met, for that existing allocation or allocations.

² *relevant land* means land within the Angas Bremer Irrigation Management Zone that is i) owned by the licensee; or ii) owned by another person with the written consent for the use of that land; or iii) under the care, control and management of the Alexandrina Council, the SAMDB NRM Board or a Minister, instrument or agency of the Crown, with written consent for the use of that land.

Irrigation Annual Reporting

What? – An Irrigation Annual Report asking for details about each component of the Code of Practice is sent to all irrigators in the Angas Bremer Irrigation Management Zone in June each year. Answering each question truthfully and returning the form is compulsory.

Why? – To achieve accreditation under this Code of Practice for Irrigators. Returning a completed Irrigation Report each year is a water licence requirement and is an obligation under the Eastern Mt Lofty Ranges Water Allocation Plan and the River Murray Water Allocation Plan. Under section 127(6) of the Natural Resources Management Act 2004, failure to complete your Irrigation Annual Report can attract an expiation fee.

When? – In June each year a letter is sent to each irrigator informing them that on-line reporting through the website (www.angasbremerwater.org.au) is open again, or, if requested, an Irrigation Annual Report form is sent in hard copy by the ABWMC or the SA Murray Darling NRM Board (the NRM Board). Completion of the on-line or hard copy form is required by 31st July each year.

How? – Follow the instructions and fill in the Irrigation Annual Report. The following information is required:

What to record	When to record
• Total water extraction from each meter (kL)	30 June each year
• Groundwater level in monitoring well (m)	Sept, Dec, March and June
• Total annual irrigation for each crop type (kL)	30 June each year
• Date of first and last irrigation for the season	Beginning and end of irrigation season
• Area of each type of irrigated crop (ha)	30 June each year
• Salinity of irrigation water applied to crops (ppm) <i>(include min. and max. salinities if variable over the year)</i>	30 June each year
• Total aquifer recharge volume, water source and salinity <i>(include min. and max. salinities if variable over the year)</i>	30 June each year
• Floods (ha and hours)	Each flood
• Type of soil moisture monitoring equipment used	30 June each year
• Area of non-irrigated deep-rooted vegetation (ha)	30 June each year
• Redgum health and possible causes of change in health	30 June each year

Any additional rootzone salinity and water efficiency information can be recorded on a FullStop record sheet or spreadsheet available from the ABWMC and a copy provided to the ABWMC.

Once the Irrigation Annual Reports have been received, the ABWMC (or NRM Board staff) on behalf of the NRM Board, will collate the information and provide each irrigator with a copy of the Angas Bremer District Irrigation Annual Report each year.

References:

Biswas T., Bourne J., Schrale G. and McCarthy M. (2009), "Salinity Management Practice Guidelines. Managing root-zone salinity for irrigated horticultural crops in winter rainfall zones of Australia". National Program for Sustainable Irrigation, Land and Water Australia.

Environmental Regeneration Australia, "Angas-Bremer Irrigation Region Revegetation Booklet" (2000).