

# LOWER LAKES WATER QUALITY REPORT

Report 9, November 2009

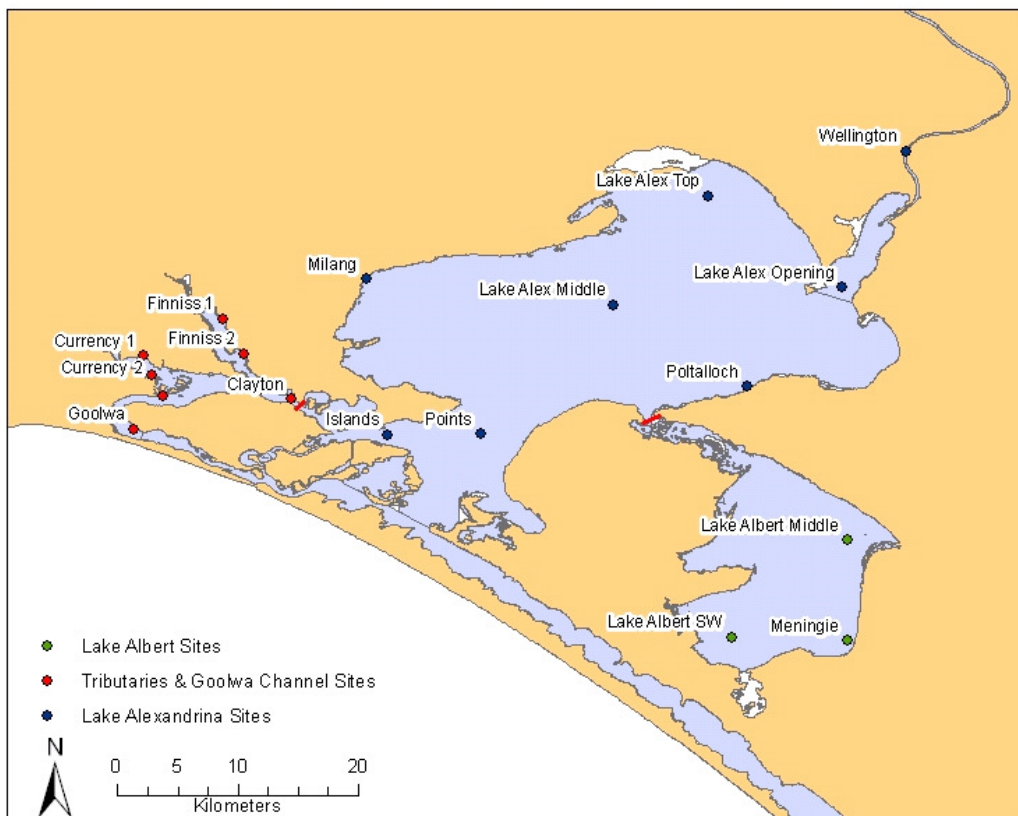
## Observations at a glance

- pH levels are within ANZECC guideline values (satisfactory) at all sites
- Alkalinity levels are stable within all areas of Lake Alexandrina and Albert. Alkalinity within Currency Creek has stabilised but remains at low levels
- Salinity levels have increased due to evaporation exceeding precipitation and inflows.

## Background

The Environment Protection Authority, South Australian Murray–Darling Basin Natural Resources Management Board, Department of Water, Land and Biodiversity Conservation, and Department for Environment and Heritage are monitoring to assess potential water quality impacts associated with water level decline and the exposure of acid sulfate soils (ASS) in the Lower Lakes. Fortnightly grab samples have been undertaken since August 2008 at 20 sites in Lake Alexandrina, Goolwa Channel, the Currency Creek and Finniss River tributaries, and 4 sites in Lake Albert (Figure 1).

**Figure 1 Map of sample sites**



## Summary

A wide range of water quality parameters are being analysed for each of the sites. The key parameters at this time are alkalinity, salinity, pH and turbidity. Water quality results are shown below for selected sites and parameters in Lake Alexandrina (Figure 2), the Finniss and Currency tributary region (Figure 3) and Lake Albert (Figure 4). The full water quality dataset is available for download on the EPA website.

- **Alkalinity** remains at high levels and above management trigger levels for all sites in the main areas of Lake Alexandrina and Albert (170 - 250 mg/L as CaCO<sub>3</sub>, Figures 2A, 4A). Low alkalinities that were previously found at the Clayton site (west side of the regulator) have recovered since refilling has completed.

The pumping event of higher alkalinity water from Lake Alexandrina has generally raised or stabilised alkalinities in the Currency-Finniss region (Figure 3A). However areas of the upper Currency still have low alkalinities (see the latest specific report for this region available on the EPA website<sup>1</sup>).

***Alkalinity is a measure of the buffering capacity of water, or the capacity of the water to neutralise acids and resist pH change. Alkalinity within water bodies is consumed as acid is released from acid sulfate soils. Adding limestone contributes alkalinity to waters helping to neutralise any acid released from the sediments. Historically alkalinity levels within this region have been between 100 – 250 mg/L as CaCO<sub>3</sub>.***

- **pH** levels are stable at approximately, 8-8.5 for all sites in Lakes Alexandrina and Albert (Figures 2B, 4B) and this is above the ANZECC guideline level of pH>6.5.

pH levels have remained relatively stable at approximately 7.8 to 8.4 in Finniss River, and have recovered and stabilised (from earlier acidified conditions) at all Currency Creek sites to a pH between 7.8 to 8 (Figure 3B).

***pH is an indicator of acidity or alkalinity. Neutral water has a pH of 7, acidic solutions have lower values and alkaline solutions have higher values.***

- **Salinity** levels (as measured by electrical conductivity) are now increasing at most sites in the lakes due to evaporation exceeding precipitation (Figures 2C, 3C, 4C, rainfall in Figure 5). The Goolwa site's salinity has stabilised due to dilution from tributary flows and the pumping from Lake Alexandrina over the Clayton regulator. However it is expected to increase over the coming summer months.

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<sup>1</sup> See

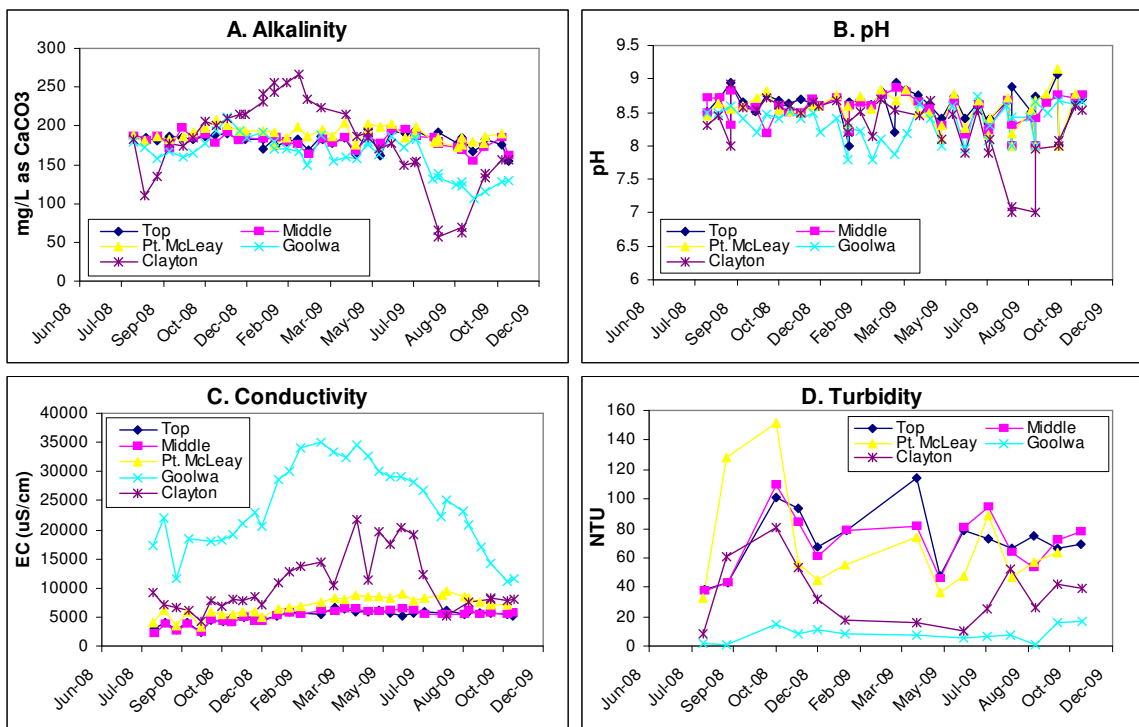
[http://www.epa.sa.gov.au/environmental\\_info/water\\_quality/monitoring\\_programs\\_and\\_assessments/lower\\_lakes](http://www.epa.sa.gov.au/environmental_info/water_quality/monitoring_programs_and_assessments/lower_lakes)

**Salinity is a measure of the amount of dissolved salts in the water. Saline water conducts electricity more readily than freshwater so electrical conductivity (EC) is routinely used to measure salinity.**

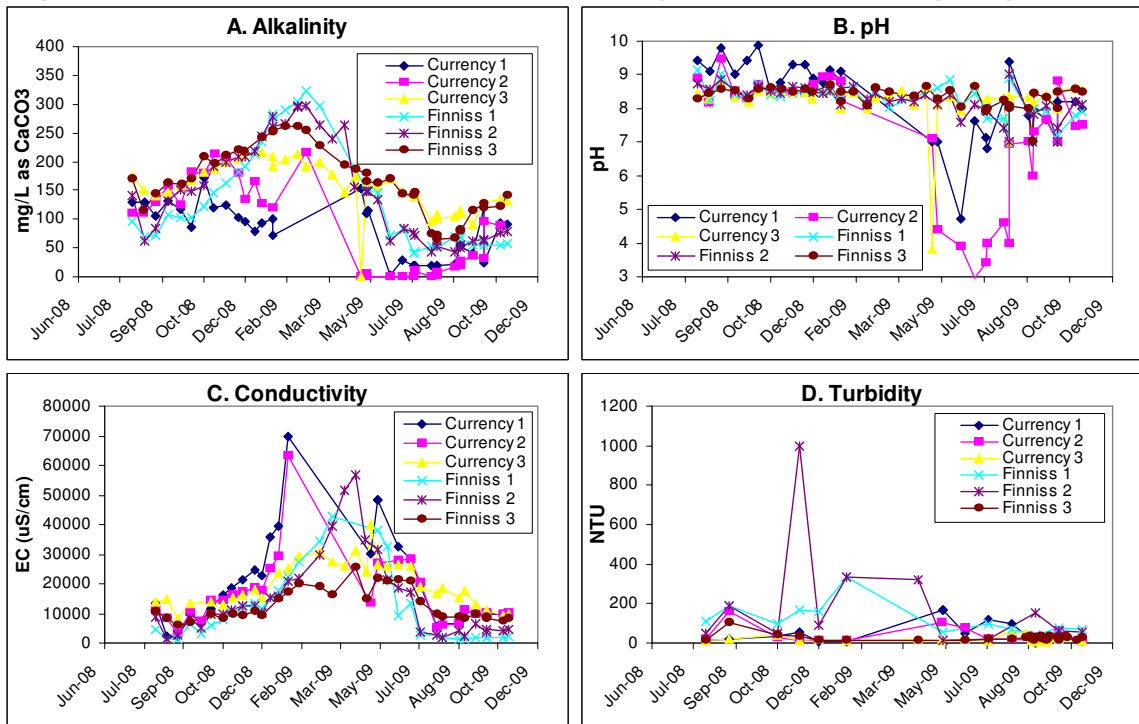
- **Turbidity** levels are quite variable and influenced by wind activity. As the water levels decline wind events will have a greater effect on the quantity of suspended material within the water (Figure 2D, 3D and 4D). The sites with high salinities (e.g. Goolwa) generally have lower turbidity as salt causes suspended particles to aggregate and settle out of the water column.

**Turbidity is a measure of how much suspended material (e.g. phytoplankton, silt, clay) is in the water. The more suspended material, the greater is the water's turbidity and the lower its clarity.**

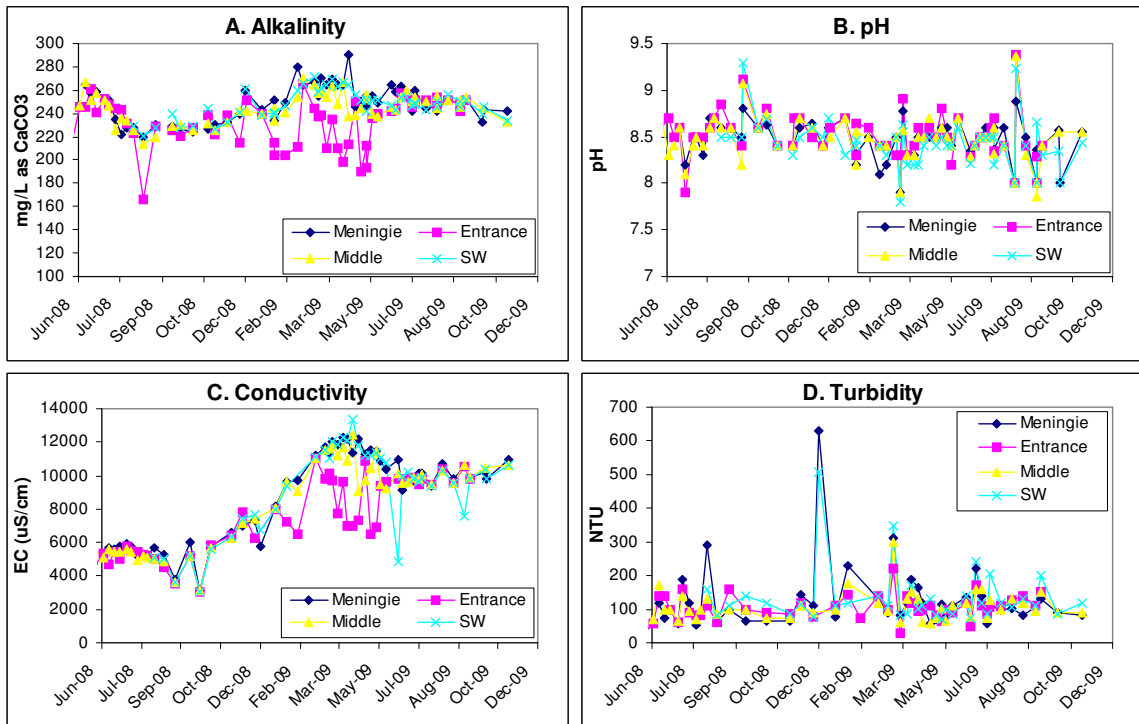
**Figure 2 Lake Alexandrina**



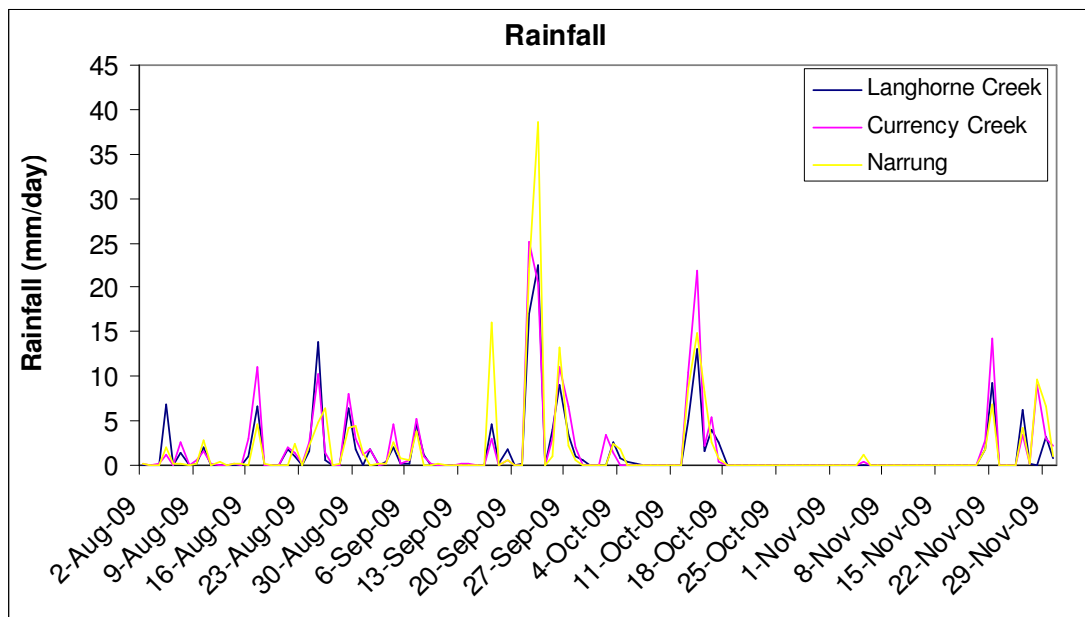
**Figure 3 Finniss River and Currency Creek tributary region**



**Figure 4 Lake Albert**



**Figure 5 Rainfall at Narrung, Langhorne Creek, Currency Creek**



Further information on water quality and quantity can be found on the following websites:

- River Murray Data <http://data.rivermurray.sa.gov.au/> (real-time data)
- Environment Protection Authority [www.epa.sa.gov.au](http://www.epa.sa.gov.au)
- Department of Water, Land and Biodiversity Conservation [www.dwlbc.sa.gov.au](http://www.dwlbc.sa.gov.au)
- South Australian Murray–Darling Basin Natural Resource Management Board [www.samdbnrm.sa.gov.au](http://www.samdbnrm.sa.gov.au)
- Murray–Darling Basin Authority [www.mdba.gov.au](http://www.mdba.gov.au)
- Waterwatch [www.waterwatch.org.au](http://www.waterwatch.org.au)