

Geographic Issue: Urban Salinity in Wagga Wagga

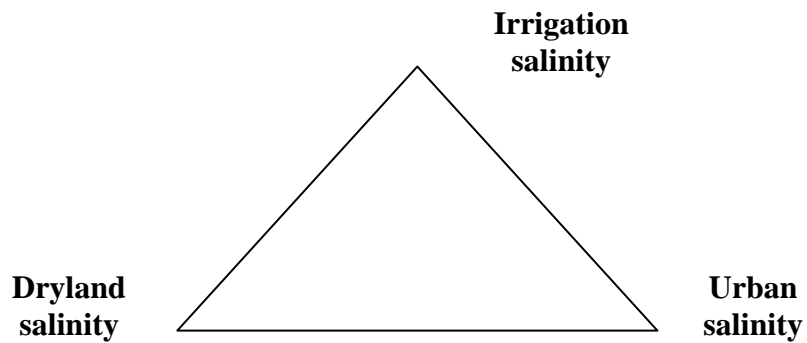
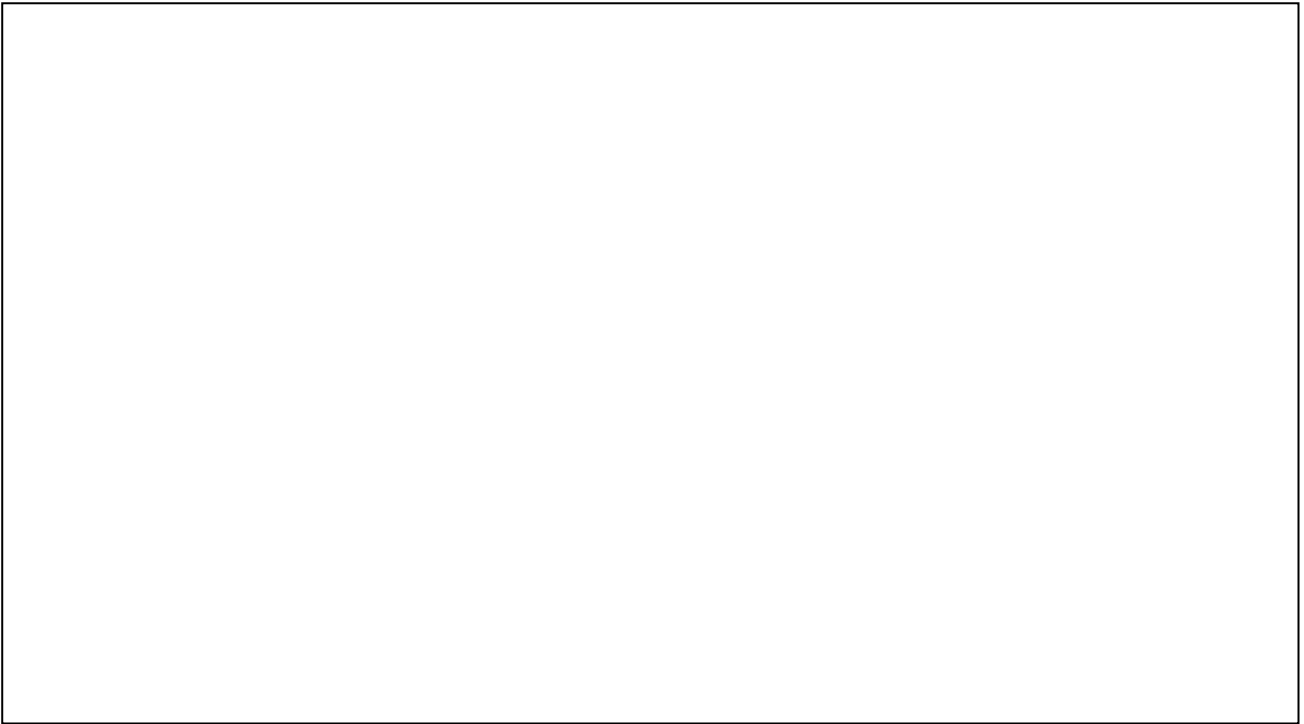


The growth of Wagga Wagga has changed the catchment's water balance. As a result the watertable has risen. Clearing vegetation for farming first changed the balance then urbanisation of this previous farmland dramatically increased recharge to the groundwater. Natural recharge by rainfall to the groundwater was approximately 1.0 mm per year, with urbanisation it is now 50 mm per year.

Sources of groundwater recharge - Estimates for the Turvey Park area 1999

Recharge source	Percentage of total
Rainfall	22
Rubble pits	14
Leaky pipes (water and sewer)	59
Garden watering	5

The Water Cycle and Salinity



Why does Wagga Wagga have a salinity problem?

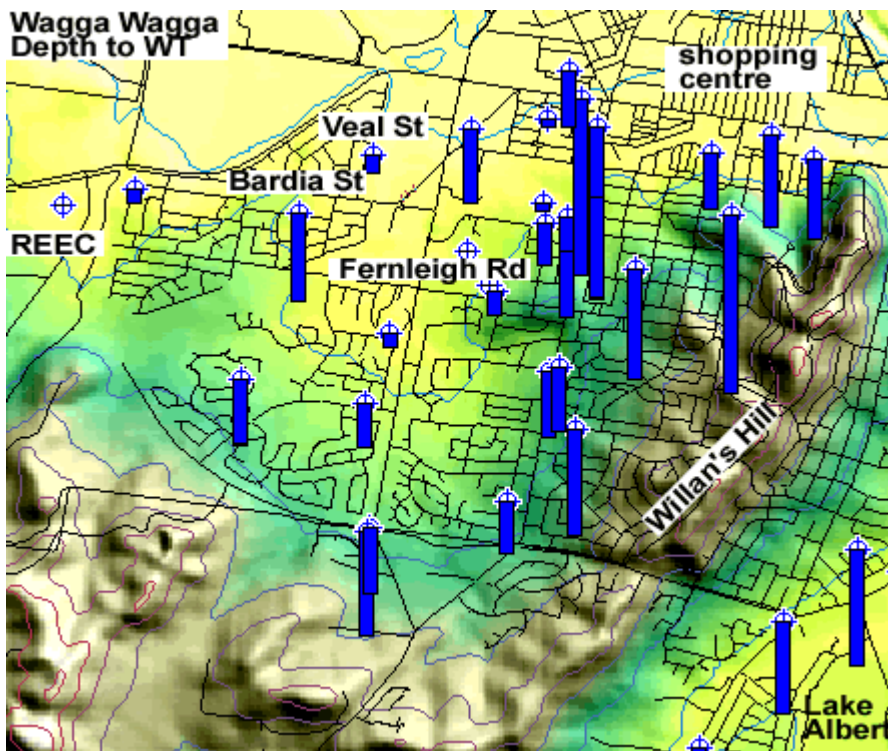
Geologic

1. _____
2. _____
3. _____

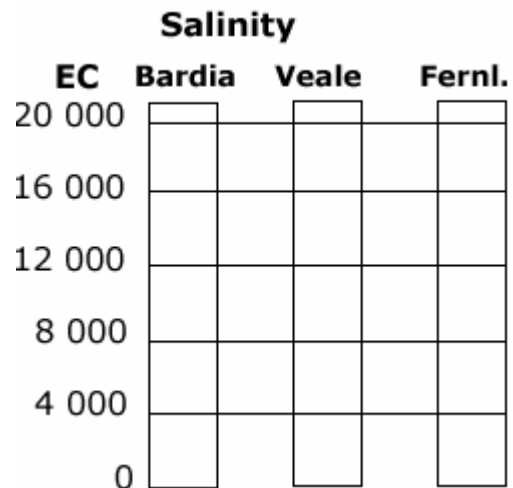
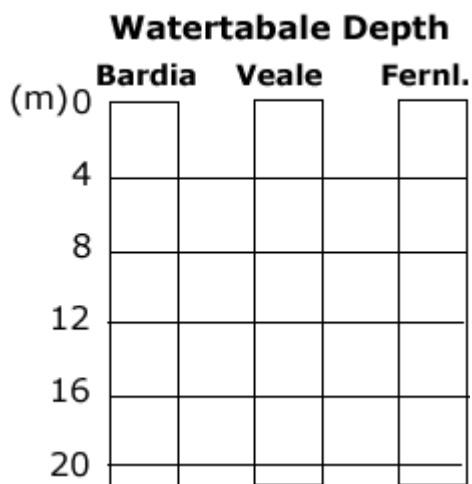
Human

1. _____
2. _____
3. _____

Location of salinity in Wagga Wagga



The map shows the location of piezometers with graphs indicating the depth to the watertable. The shorter the graph, the closer the watertable is to the surface.



Comment on how watertable depth varied in the three piezometers.

Comment on how salinity varied in the three piezometers.

Catchment stormwater investigation

Two stormwater drains meet at the bottom of the catchment near the Rules Club. The Fernleigh Rd drain collects water from the eastern side of the catchment and the Glenfield Rd drain collects water from the southern end of the catchment.

Salinity Glenfield drain _____ EC Salinity Fernleigh Rd drain _____ EC
 Comment

Salinity Survey – discharge area

Quadrat

Mark out an area 3m X 3m and map the salinity indicators: plants, bare ground, salt crystals. Use a legend with symbols for the different indicators.

Salinity rating

1. low salting
 - sea barley grass often abundant
 - no salt crystals
 - no or few bare patches
 - soil salinity 2000 to 4000 EC

2. Moderate salting
 - bare areas up to 1 metre
 - salt crystals when dry
 - soil salinity 4000-8000 EC

3. Severe salting
 - large areas of bare ground
 - often only 2 plant species
 - salt crystals when dry
 - soil salinity 8000 + EC

Legend

- | | |
|---------------|------------------|
| Bare ground | Sea barley grass |
| Salt bush | Wire grass |
| Couch | Others |
| Salt crystals | |

Give your quadrat a salinity rating and list the reasons for this.

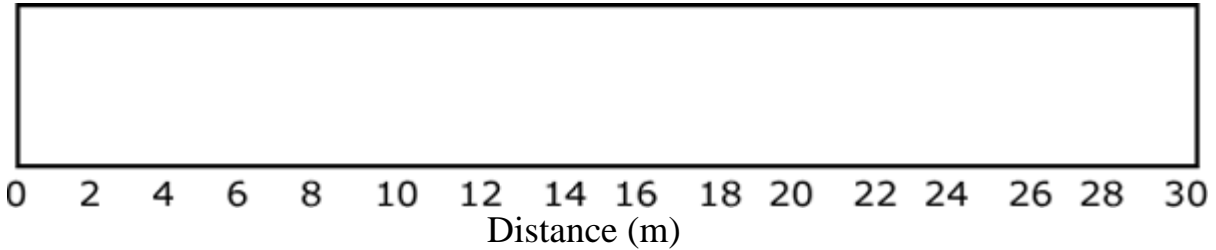
Transect

Mark a transect line 30m long with a tape measure.

Record the different salt indicators along the line.

Do soil salinity tests at 0, 15 and 30 metres and record your results.

(1:5 soil and water mix)



Legend

Bare ground	Salt bush	Wire grass
Surface water	Sea barley grass	Kikuyu or couch
Salt crystals	Tree	Other

Soil salt tests

0m ————— EC 15m ————— EC 30m ————— EC

Describe how salinity indicators changed along the transect.

Where on the transect does the salt sensitive kikuyu or couch appears? Why?

Was there a relationship between the indicators and the soil salinity results?

Recharge Area

Describe where you are in the catchment.

Explain why this is a groundwater recharge area.

Biodiversity and abundance survey

Record the location of trees and shrubs in the quadrat. Make a key to identify them.

Key

Red gum

Grey box

White box

Yellow box

Golden wattle

Box leaf wattle

Deane's wattle

Hairy leaf pea

Parrot pea

Flax lily

Grass

Why investigate natural bushland in a recharge area?

Management

Explain how we manage each of the causes of salinity listed below.

1. Past clearing of recharge area

2. Rainwater from houses (14% of recharge is from rubble pits)

3. Water from home gardens (5% of recharge is from watering gardens)

4. Leaking water and sewer pipes (59% of recharge)

Explain why we need to manage salinity on a catchment scale.

Terms to use

recharge infiltration salt tolerant dewatering bores engineering works	urban infrastructure quadrat transect discharge catchment	salt sensitive revegetation waterwise piezometer soil salinity test salinity indicators
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REEC web site with study guide:

www.reec.nsw.edu.au go to students 7-12 then 7-10, salinity