Wagga Wagga
Urban Salinity Guide

Urban Salinity Management

Wagga Wagga Urban Salinity Guide

This Guide gives an overview of the urban salinity issue present in Wagga Wagga. Information in this guide includes why Wagga has this problem, what the impacts are and what can be done to minimise the risk and reduce the impact of urban salinity.

The Urban Salinity Guide provides information on key locations, including directions for individuals to take a self guided tour of Wagga Wagga. Larger groups such as schools, universities, Scout groups etc are invited to contact Wagga Wagga City Council to have a Council representative conduct a guided tour. Please use the contact details below.

Using this Guide

This guide includes;

- A map of the tour sites and suggested route
- Explanations for each site
- Relevant background information for each site
- A map of piezometer locations

Further information can be obtained from the Wagga Wagga City Library or online at www.wagga.nsw.gov.au. For any comments or suggestions regarding the Wagga Wagga Urban Salinity Guide please contact Councils Sustainability Education Officer on;

1300 292 442
sustainablewagga@wagga.nsw.gov.au

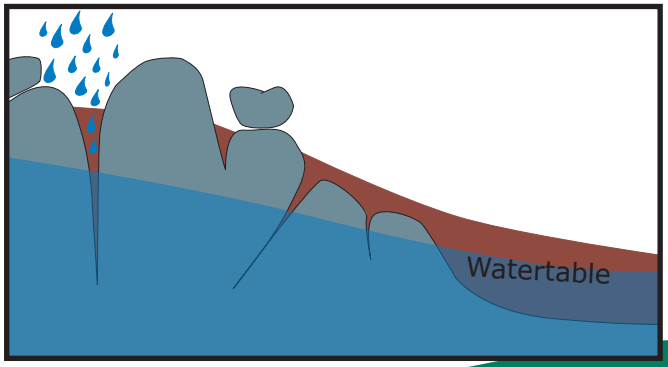
Background information
Why do we have a problem here in Wagga Wagga?

The effects of salinity were first identified at the Wagga Wagga Showground in the late 1970s where grass was dying off and despite encouragement the grass would not return. The cause of this dieback was not determined until 1994 where after extensive testing and research it was determined that the area was suffering from the effects of urban salinity. However, the processes involved in urban salinity were well underway long before this evidence appeared on the surface.

The Wagga Wagga region has a pre-disposition to salinity. Factors including underlying geology, soil type and prevailing winds have contributed to the high salt load in our soils and the ease at which excess water can enter the groundwater system.

However it is the human influences, such as land clearing and urban development, that have exacerbated these conditions causing the problem that we see in Wagga Wagga and in many other areas in Australia and around the world.

Wagga Wagga is dominated by granite landscapes, characterised by rounded hills and in some locations exposed rocky outcrops (particularly to the north of the Wagga Wagga township). As granite weathers, deep fractures appear in the rock. These fractures allow water to easily infiltrate deep into the ground ending up in groundwater reserves.

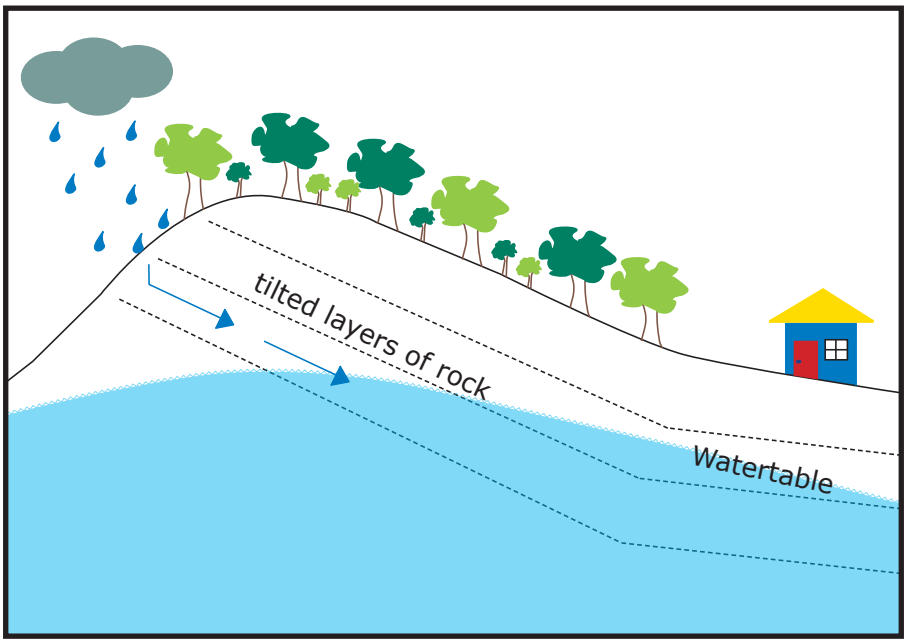


This diagram shows the ease at which rainwater can enter the watertable via fractures in the underlying geology

The tilting of rock layers, caused by volcanic intrusions or continental collisions, can also direct rainwater through the horizontal layers of the rock and into the watertable (See diagram below).

The shape of Wagga Wagga's catchment also plays a role as it is a large drainage basin with a narrow outflow point due to the surrounding hills. This makes it difficult for groundwater to leave the catchment causing the water to rise and reach the grounds surface causing water logging and salinity.

The thick clay soils associated with granite geology can also restrict the movement of groundwater. Clay deposited on the floodplain restricts the movement of groundwater travelling down the slopes and can also cause the water to back up and reach the soil surface.



Horizontal layers of rock that have been tilted can allow rainwater to seep through the rock - directing flow straight into the watertable

We now know water can easily enter groundwater reserves in our area – but how does this cause salinity?

Large amounts of water entering the ground will cause the groundwater levels to rise. As this water rises it collects the salt particles in the soil and turns it into solution. As the watertable continues to rise these salts in solution are also transported through the soil profile. Within a few metres of the surface the salty groundwater will be drawn up by surface tension and evaporation. As the water evaporates the salt crysals remain in the surface soils, on road formations, in bricks and concrete and cause corrosion of metal pipes. a high salt concentration in the surface soils may cause damage to roads, buildings and infrastructure.

Where do these salts come from?

Salt is naturally occurring in the environment. Salt can be released from rocks as they weather and turn into soil. Salt particles are small enough to be easily transported by the wind (aeolian). Sources of wind blown salt are from the Tasman Sea and Pacific Ocean to the east and from further inland to the west where a large inland sea once covered the land. It is estimated that 15kg of salt is added to soils in the south-east of Australia per hectare per annum as a result of wind blown salt (*Source: Riverina Environmental Education Centre).*

These are all natural processes. However; humans have altered the landscape and have allowed salts to more easily and rapidly reach the surface.

The main influencing factor is vegetation removal. Native trees, especially our deep rooted Eucalypts, send their root systems far into the ground and tap into ground reserves to obtain water. These roots maintain the depth of the water table below the ground.

The Wagga Wagga urban catchment is approximately 44 km² and plant communities that once dominated the area include;

- River Red Gum Woodland (River Red Gum, Yellow Box, Wattle, Sheaoak, Kurrajong) located in floodplain areas
- Mixed Box Woodland (White, Grey and Yellow Box; Red Gum, Cypress Pine, Kurrajong, Wattle, Bush-Pea) found on the lower slopes
- Various Woodlands on the upper slopes.

When these trees and vegetation were removed and replaced with shallow rooted plant species such as pastures, lawns or exotic garden species, the water table began to rise – bringing with it the salt in the soil. More than 90% of the native vegetation has been cleared since the settlement of Wagga Wagga in the mid 19th Century, and is clearly a major factor in the urban salinity story.

Other human activities that can increase the amount of water reaching groundwater reserves include the over irrigation of gardens, leaking pipes and stormwater in rubble pits.

River Red Gum Woodland on the Murrumbidgee River Floodplain

Photograph: David Read

Start point - Wagga Wagga Visitor Information Centre

183 Tarcutta Street, Wagga Wagga

The current Civic Centre was completed in 1999 at a cost of $20 million. The Council precinct is also home to the Museum of the Riverina Historical Council Chambers site, The National Art Glass Gallery and the Civic Theatre.

The Growth of Wagga Wagga

The city was established close to the river and its floodplain so that the townspeople had easy access to the fresh waters of the Murrumbidgee River. Clearing of the land for the development of a town and agriculture started in the 1830s. Wagga Wagga was proclaimed a town in 1849 and by 1952 Central Wagga ended at Johnston Street to the south and the suburb of North Wagga Wagga to the north.

The town spread slowly towards Willans Hill. The city extended to Urana St taking in the suburb of Turvey Park by 1940. Over the next fifty years urban development continued southward to include Ashmont, Lake Albert, Kooringal, Mount Austin, Tolland and Glenfield Park.

Since 1990 urban development has extended to the hill slopes north of the floodplain at Estella. The southern hillslopes have also been developed to include the suburbs of Tatton, Lloyd and Bourkelands. It is no doubt that with the growth in population in the future we will see further expansion of the surburban area of Wagga Wagga.

Next stop: Leavenworth Drive

Directions for Vehicles over 4.5 tonnes;

Travel south on Tarcutta Street, turn right at the lights onto Edward Street, turn left on to Edmonson Street and then continue as it becomes Northcott Parade. Turn left into Walteela Avenue just before the T intersection with Leavenworth Drive. Turn right onto Marama Parade then right onto Leavenworth Drive and park near the Salinity Interpretive signage.

Background Information - Murrumbidgee River Salinity

Wagga Wagga is located in the Murrumbidgee Catchment, which is one of many river valleys that make up the Murray-Darling Basin. Around 400,000 tonnes of salt flows past our city each year – that's 1,096 tonnes per day!

Salt reaches the Murrumbidgee River from creeks draining highly saline land and salty groundwater seeping into the tributaries and the river itself. Significant amounts of salt are added to the system by smaller sub-catchments including Muttama Creek and Jugiong Creek.

Blowering and Burrinjuck Dams control the timing and amount of water flowing down the Murrumbidgee River. Below Wagga Wagga a large amount of water is diverted for irrigation which supplies the Murrumbidgee Irrigation Area (MIA) and Colleambally Irrigation Area including the areas of Griffith, Leeton, Yanco, Darlington Point and Colleambally.

However, as we are just one entity in the Murray-Darling Basin, we need to be aware that the problem of high levels of salt entering the system in Wagga Wagga can have downstream effects.

Where does our domestic water come from?

Towns such as Wagga Wagga and people living along the river use the water for stock and domestic purposes. Around 25% of Wagga Wagga's water comes from the Murrumbidgee River with groundwater reserves accounting for the remaining 75%.

Alternative Car Route Directions;

Travel south on Tarcutta Street. Continue on through the traffic lights along Lake Albert Road. Turn right on to Stanley Street which becomes Leavenworth Drive when crossing the hill.

Travelling Time: 10 minutes

Parking: along the road side opposite Marama Parade

Stop 1 - Leavenworth Drive

What you will see here;
* Salinity interpretational signage
* Revegetation site

This site was once lush bushland before it was cleared for urban development in the 1960s. Considering our underlying geology and vegetation removal play a significant part in the urban salinity problem – it is interesting to see these two together. Clearing vegetation from hilltops will certainly allow more water in to the ground from this location. Now that we understand the link between vegetation clearing and salinity, it's important that we keep as much natural vegetation on the hilltops as possible and save these areas from urban development.

Leavenworth Drive, as well as all the other hilly areas where water can easily seep into groundwater is referred to as **recharge areas**. It is important that when Council or other agencies plan salinity revegetation works that these recharge areas are targeted. This is one strategy that Wagga Wagga City Council in conjunction with the Riverina Local Land Services sees as vital to managing urban salinity.

Some challenges with revegetation works include finding large enough expanses of land for tree planting in urban areas and the maintenance work required for the upkeep of the site.

Next stop – Lloyd West Subdivision Red Hill Road

Directions: travel west along Leavenworth Drive and turn left onto Bourke Street at the T interesection. Turn right at the roundabout onto Red Hill Road and continue to the entrance of the Lloyd West subdivision.

Travelling time: 5 minutes

Parking: on road shoulder just short of entrance to Lloyd West

Background Information - Tree and Shrub Planting

Wagga Wagga City Council has various management strategies in place to tackle urban salinity including hard engineering, revegetation, planning controls and community education.

Re-planting and community education aims to:

- Increase the area of perennial native vegetation in the local area
- Encourage the establishment of salt tolerant and water wise plant species
- Increase residents awareness of how their activities can impact on urban salinity
- Encourage water wise practices in the garden and minimise the area of lawns, which are usually shallow rooted and often require a lot of water
- Encourage nurseries to promote water wise gardening

Community education and engagement in the urban salinity issue is vital to achieving our goals. As people become more aware of their impact and the consequences of urban salinity, the more likely they will actively take part in projects to help manage the problem. This goes for businesses as well. Wagga Wagga City Council appreciates the financial contributions and hard work carried out by local businesses and community groups for urban salinity management.

Local schools, businesses, scouts, council staff, community members and Landcare groups have assisted with planting for salinity management. Locations have included Silvalite Reserve, Hill Top Estate, Moorong Street, Gregadoo Waste Management Centre, Glenfield Park and North Wagga.

In 2009, a major salinity planting project took place. Grant funding provided by the Murrumbidgee Catchment Management Authority allowed for 16,000 seedlings to be planted. The RAAF Base Forest Hill, Cargill Beef Australia and the Wagga African Community Group assisted with planting trees, shrubs and grasses at locations in Gregadoo, Glenfield Park and Hilltop.

Stop 2 Lloyd Urban Release Area

What you will see here;
* 80:20 Development Control Plan in action

The Lloyd Urban Release Area is an area that is particularly important for managing urban salinity within the broader Wagga Wagga urban area. As such, the rezoning of land for residential purposes was permitted only if certain special controls and measures were implemented to help minimise potential impacts on urban salinity [Fact Sheet: Development in Lloyd].

One of the special conditions applying to the Lloyd Urban Release Area is that developers must ensure that a minimum of 80% of the suburb is covered by impervious surfaces (i.e. a surface through which water cannot penetrate).

For each individual allotment there is a special plan, created by the developer, which indicates the minimum area of the site which must be impervious and includes the road immediately adjacent to the allotment (to the centreline). That plan is known as the "80:20 plan".

Next stop – Glenfield Road

Directions: travel south back along Red Hill Road, turn left into Dalman Parkway and then left at the roundabout onto Glenfield Road. Pull to the side of the road just short of the roundabout with Fernleigh Road.

Travelling time: 4 minutes

Parking: on the left shoulder of Glenfield Road

Typical layout to achieve 80:20 Impervious:Pervious

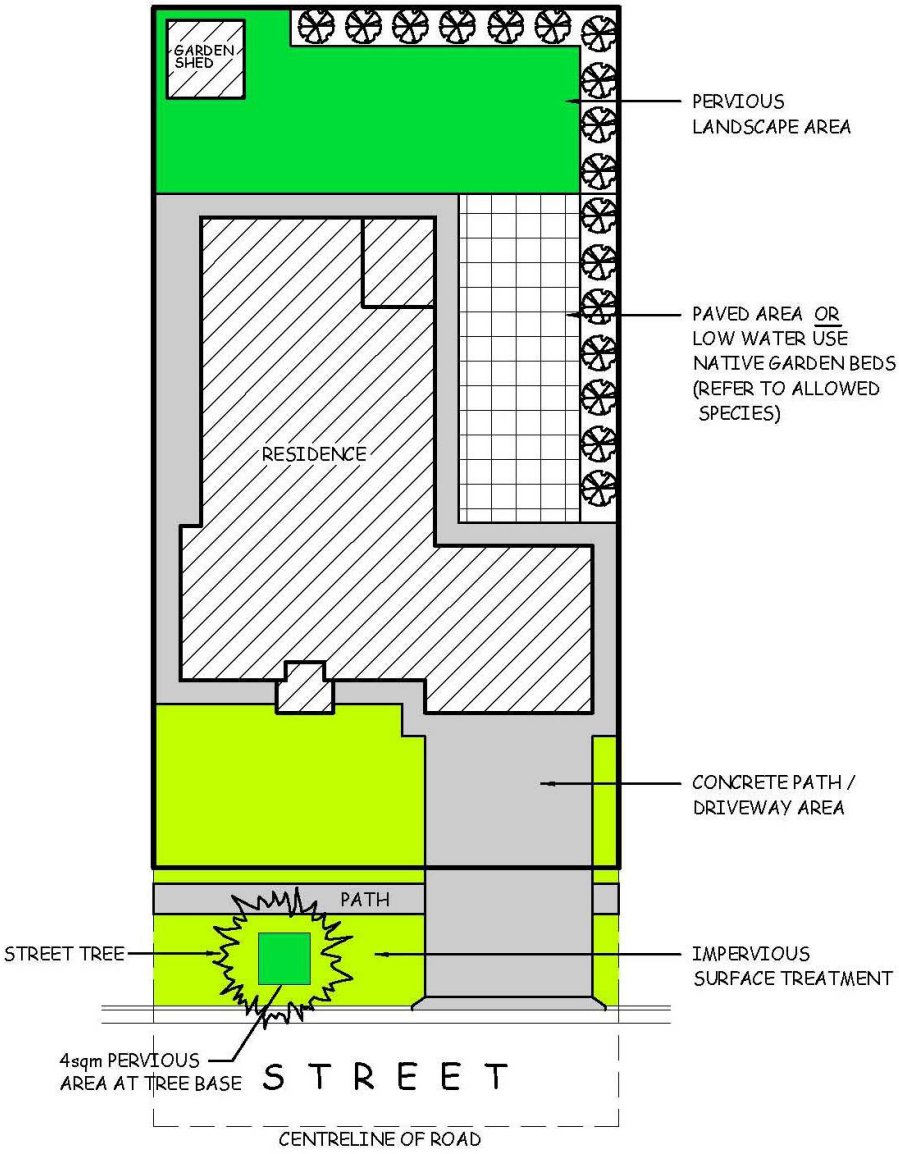


Image courtesy of MJM Consulting Engineers

Stop 3 - Glenfield Road Drain

What you will see here;
* Glenfield Road Drain

Engineering strategies play an important part in managing urban salinity. A trickle flow line is a subsurface drainage system aimed at limiting contact between stormwater and soil to prevent stormwater from seeping down through soil and in to the watertable. This trickle drain is designed to take smaller storm events where water is likely to pool and soak into the ground rather than run off. The visible open drain situated above the trickle drain is designed to take stormwater from larger rain events events.

This trickle drain is connected to a network of other trickle drains – taking in Red Hill Road, Jubilee Park, Bourkelands and Lloyd.

This photo shows the trickle drain outflow point near the intersection of Fernleigh and Glenfield Roads. The trickle drain has been installed beneath the open drain running parallel to Glenfield Road

Next Stop – South Campus, Fernleigh Rd

Directions: travel north along Glenfield Road, turn right at roundabout with Fernleigh Road. Stop alongside South Campus Sports Oval.

Travelling Time: 2 minutes

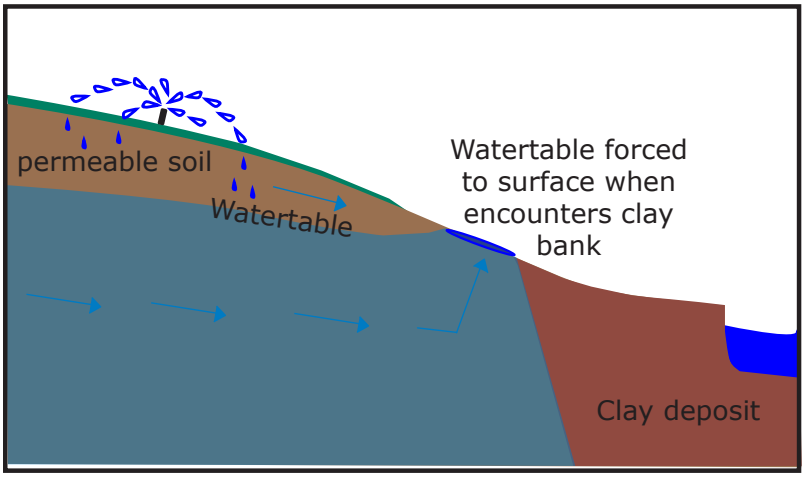
Parking: along roadside opposite Quail Street

Stop 4 - South Campus, Fernleigh Rd

What you will seen here;
* Salt affected land
* Salt tolerant plants growing on salt affected area
* Piezometer to measure groundwater height and electrical conductivity

Vegetation dieback, the presence of salt tolerant plant species and a visible salt crust indicate that this area is severely affected by salinity and is a discharge area. A **discharge area** is where the watertable reaches the soil surface.

Groundwater has been brought to the surface in this location as a result of a clay belt further down slope. This clay has built up over many thousands of years as clay sediments have been deposited on the floodplain by the Murrumbidgee River. Clay is a fine textured soil which means that the particles can sit tightly together making it difficult for water to pass through the soil. In this location, groundwater moving downslope through more permeable soils encounters a bank of clay. This water cannot flow through this clay very easily and the water starts to rise and eventually reaches the surface.



This diagram shows the watertable discharging as a result of a clay bank

Rehabilitation of this site will be very expensive and there will be a need for extensive works to be carried out to ensure that any new structures built will be able to withstand the saline conditions. It may be a requirement for any construction in this area to include marine strength concrete and double fired bricks to make the buildings more resistant to attack by salt. Despite the costs that may be involved in developing the site, due to its location close to central Wagga Wagga, it may be financially viable.

Visible salt crust at South Campus, Wagga Wagga

Next stop – Wagga Wagga Showground

Directions: travel east along Fernleigh Road and take first left into Hely Avenue, turn left on to Charleville Road and right on to College Avenue. Turn left onto Urana Street and then right into Showground (2nd entrance gate). Buses are able to turn around here and there is also access to view the Showground.

Travelling time: 2 minutes

Parking: within the Showground

Background Information - Piezometers

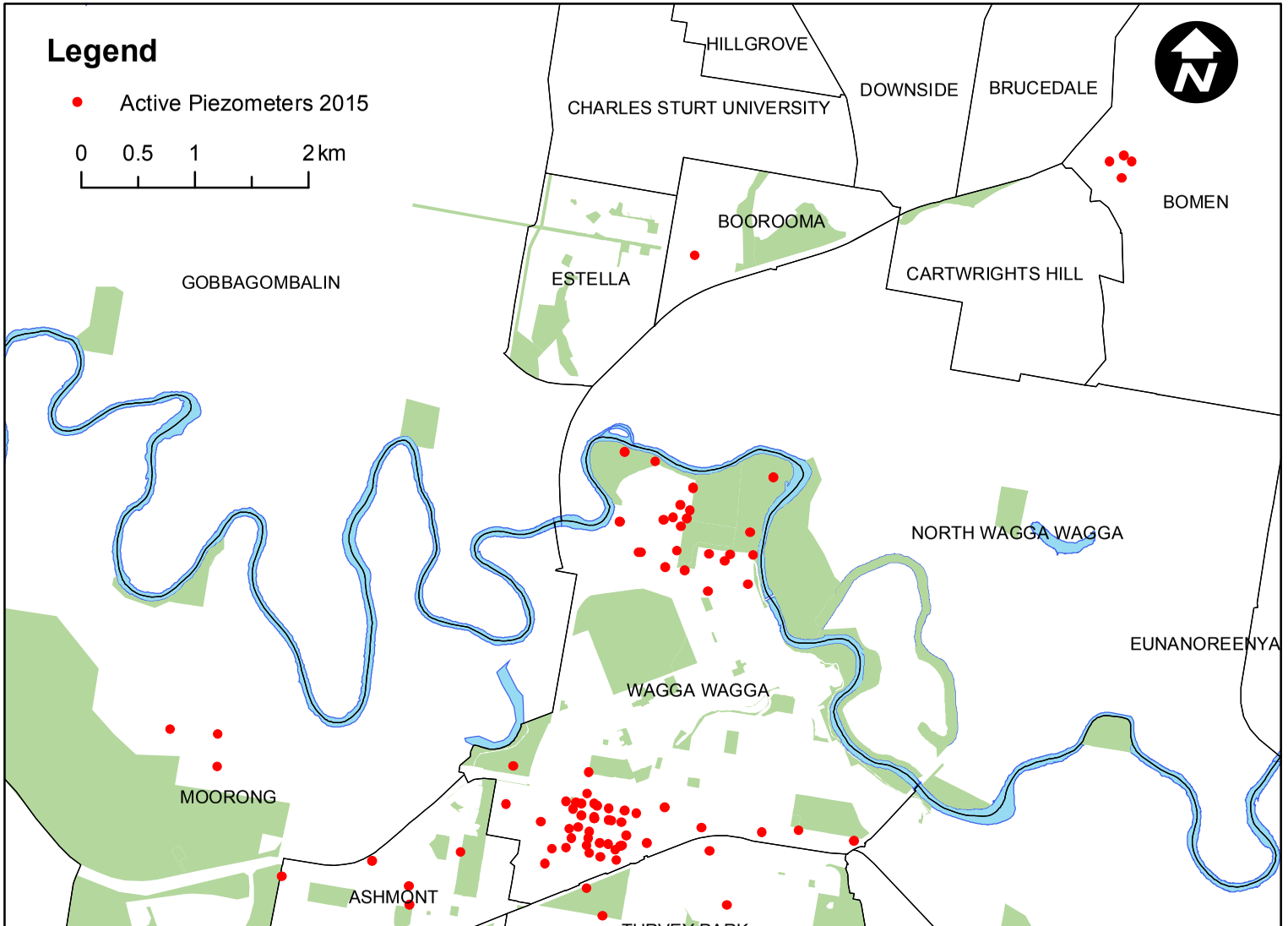
A piezometer is a non-pumping bore used to measure groundwater pressure or the level of the watertable. Currently 211 piezometers are located in the Wagga Wagga Local Government Area with more likely to be installed as Wagga Wagga develops.

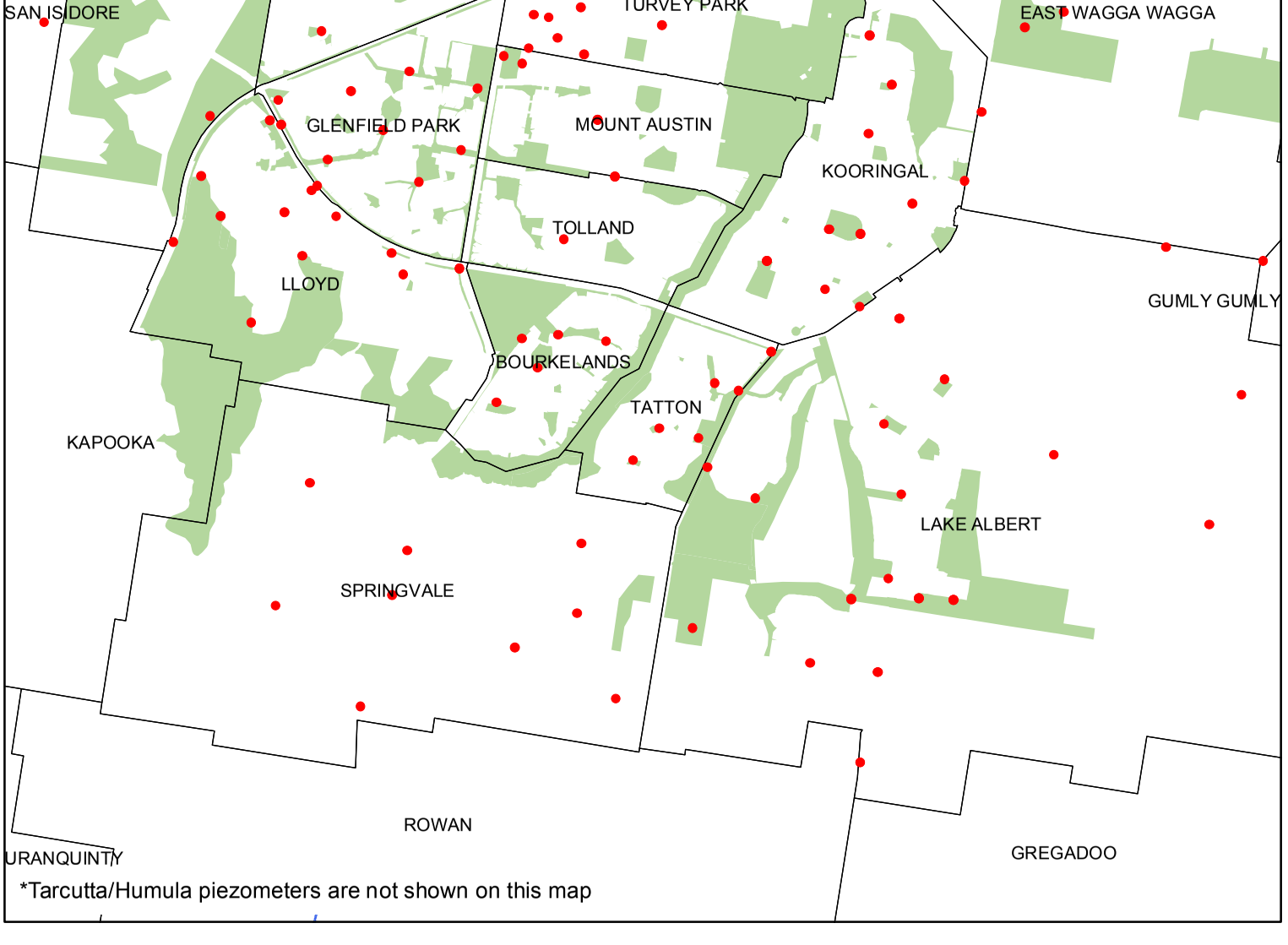
The piezometer consists of a sealed PVC pipe of 40mm diameter, with narrow slots cut into the bottom section to allow water entry. They are usually installed to a depth greater than three metres.

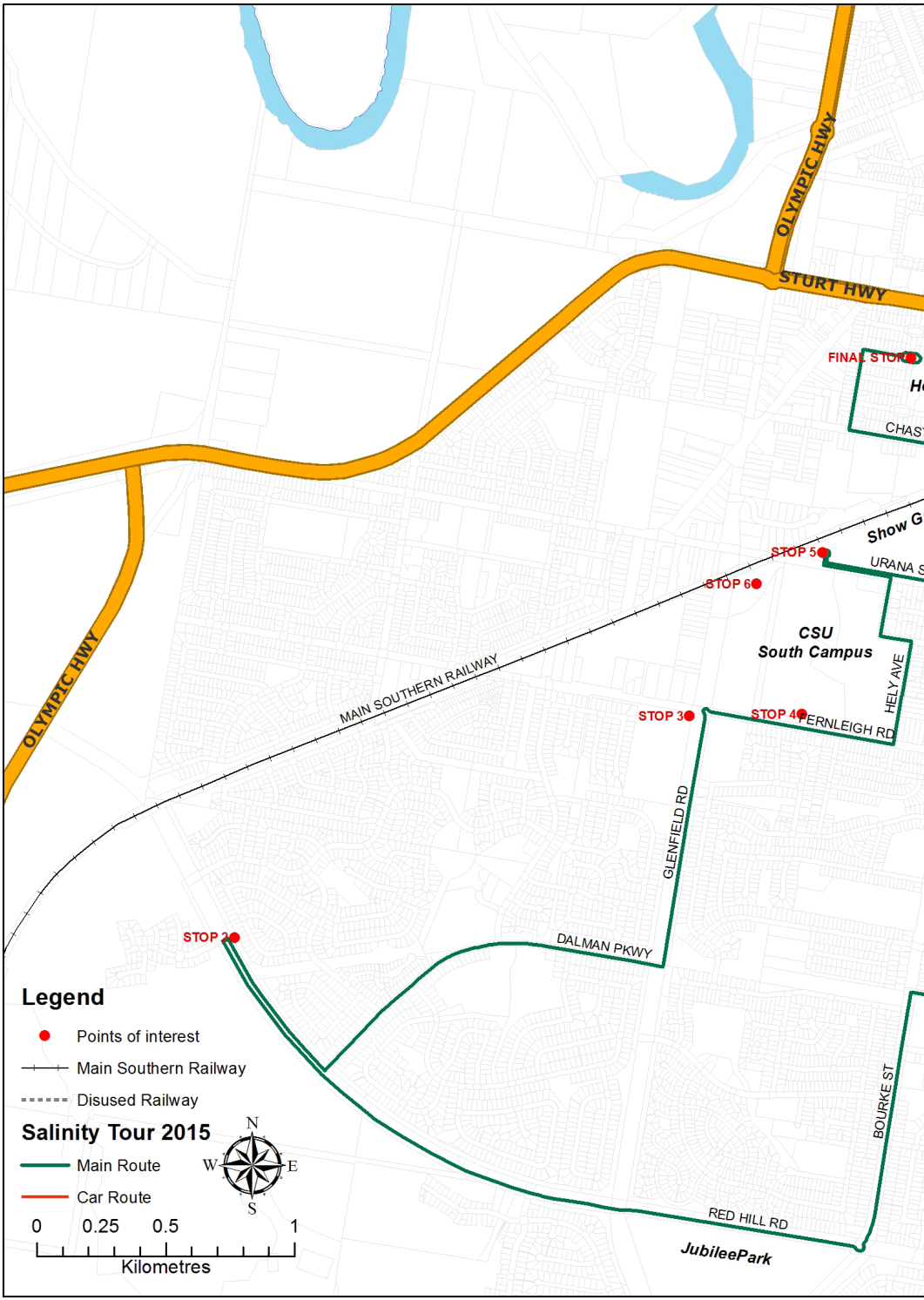
Piezometers in the Wagga Wagga area are monitored monthly. The depth of the watertable and salinity level is recorded and the information entered into a database to collate and interpret long term data.

The level of salinity is given as Electrical Conductivity (EC). Put simply, 1 EC = 0.64mg of salt per litre.

2 of the 211 piezometers located within the Wagga Wagga Local Government Area


Legend
Active Piezometers 2015
0 0.5 1 2 km
HILLGROVE
DOWNSIDE
BRUCEDALE
CHARLES STURT UNIVERSITY
BOOROOMA
BOMEN
ESTELLA
CARTWRIGHTS HILL
GOBBAGOMBALIN
NORTH WAGGA WAGGA
EUNANOREENYA
WAGGA WAGGA
MOORONG
ASHMONT


SAN ISIDORE
TURVEY PARK
EAST WAGGA WAGGA
GLENFIELD PARK
MOUNT AUSTIN
KOORINGAL
TOLLAND
LLOYD
GUMLY GUMLY
BOURKELANDS
TATTON
KAPOOKA
LAKE ALBERT
SPRINGVALE
ROWAN
URANQUINTY
GREGADOO
*Tarcutta/Humula piezometers are not shown on this map


OLYMPIC HWY
STURT HWY
FINAL STOP
CHAS
Show G
STOP 5
URANA S
STOP 6
CSU
South Campus
HELY AVE
OLYMPIC HWY
MAIN SOUTHERN RAILWAY
STOP 3
STOP 4
ERNLEIGH RD
GLENFIELD RD
STOP 2
DALMAN PKWY
BOURKE ST
RED HILL RD
JubileePark
Legend
Points of interest
Main Southern Railway
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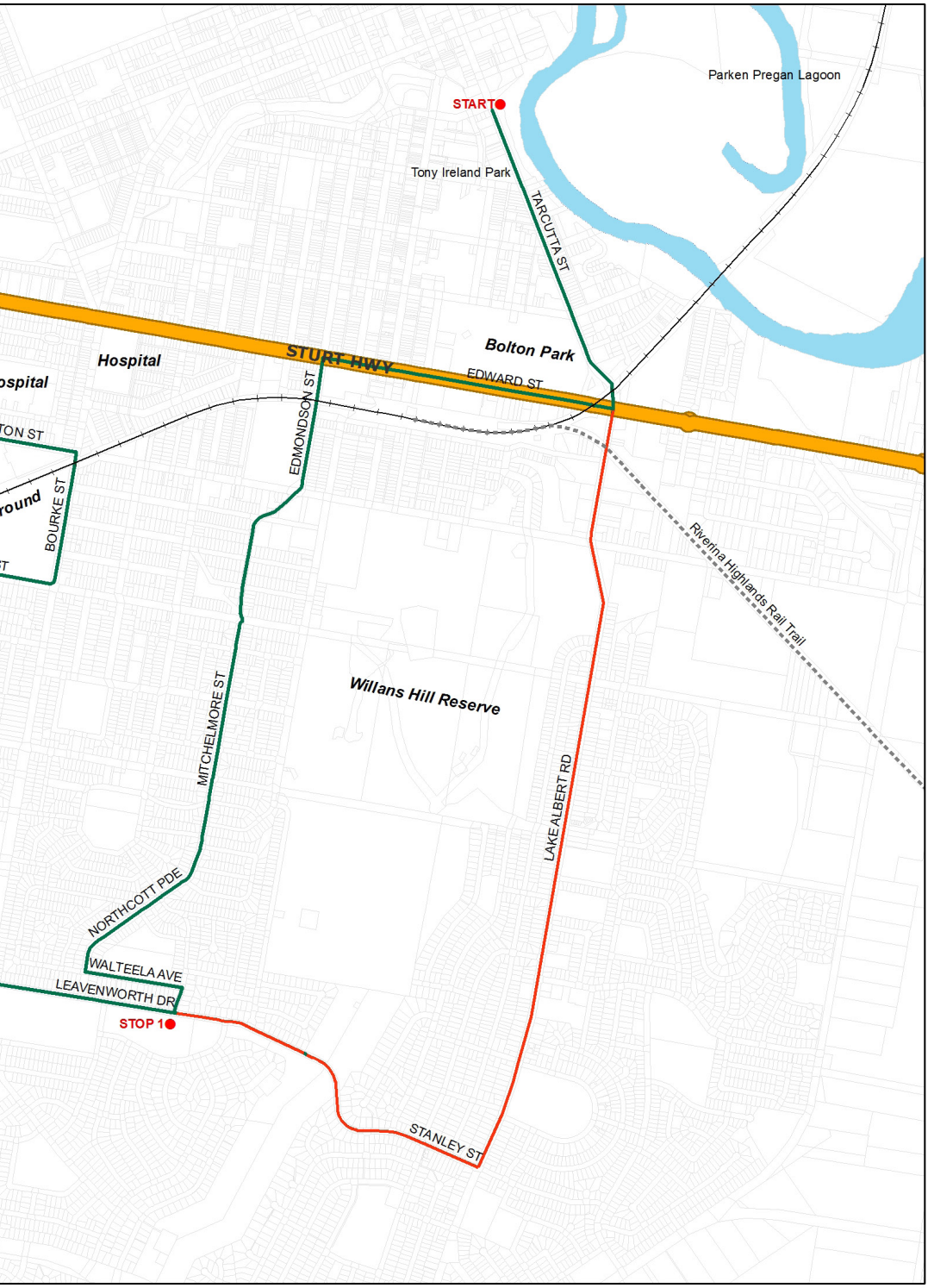
Kilometres


Parken Pregan Lagoon
START
Tony Ireland Park
TARCUTTA ST
Bolton Park
STURT HWY
EDWARD ST
Hospital
ospital
TON ST
EDMONDSON ST
BOURKE ST
Riverina Highlands Rail Trail
Willans Hill Reserve
MITCHELMORE ST
LAKE ALBERT RD
NORTHCOTT PDE
WALTEELA AVE
LEAVENWORTH DR
STOP 1
STANLEY ST

Stop 5 - Wagga Wagga Showground

What you will see here;
* Revegetation of the inner ovals of the showground and trotting track
* Salt tolerant grasses

It was at this site where urban salinity was first identified in Wagga Wagga. The grass on the ovals started to die back and despite extensive works, the grass would not grow. Investigations in to the matter showed a high concentration of salt in the upper limits of the soil profile.

In response to this site being a discharge area, a series of pipes were installed around 1.2 metres below the surface in order to drain the area of groundwater to prevent it from reaching the surface. From the showground, the water flows into an evaporation basin to the west of the Showground further along Urana Street.

Wagga Wagga	dS/m
Wagga Wagga drinking water	0.2-0.3
Lake Albert	1.1
Emblen Park - deep aquifer	1.38
Emblen Park - shallow	2.05
South Campus	14.5
Glenoak	0.78
Mortimer Place	11.8

These tables show general salinity readings and readings of sites in Wagga Wagga.

General	dS/m
Distilled water	0.0
Level to disturb vegetation	1.0
Limit for human consumption	2.5
Saline water	6.0
Limit for livestock	11.0
Pacific Ocean	59.0

Next Stop – Evaporation Basin

Directions: travel west (walk) along Urana Street to the interpretive signage on the left hand side of the road.

Travelling Time: 2 minute walk

Stop 6 - Evaporation Basin

What you will see here;
* Small earthen dam – evaporation basin
* Interpretative signage
* Small trees and shrubs planted along road and the basin

This is the outlet for groundwater drained from the Wagga Wagga Showground. This is safe disposal of saline groundwater, as the water is unable to drain into the stormwater system which flows to the Murrumbidgee River. The saline groundwater is allowed to pool on top of the compacted clay sealed dam and the water eventually evaporates leaving behind a salt crust.

Once there is a significant accumulation of salt on the bed of the evaporation basin, the salt is removed. The salt collected here could potentially be suitable for industrial use.

Evaporation Basin on Urana Street at a time it was full of groundwater

Final stop – Emblen Park Demonstration Garden

Directions: travel west along Urana Street to the roundabout and turn left onto Docker Street. Travel over the railway line and take the first left into Chaston Street. Turn right into Cullen Road and right into Hardy Avenue.

Travelling time: 5 mins

Parking: Near demonstration garden on Hardy Avenue

Background Information - Evaporation Basin

The evaporation basin has been built to:

- Ensure the ongoing use of the Showground by controlling the water table height at the site
- Safely dispose of salty groundwater and prevent it from reaching the river
- Test the effectiveness of an evaporation basin in managing salinity in an urban environment

In response to the dieback of grass at the Showground in 1993, the top soil was removed, however this did not help the grass re-establish. After further investigation it was declared that this area was suffering with a salinity issue. From here salinity investigations were carried out right across the city. The watertable was very close to the surface at the Showground making the ground damp and salty.

In May 1994 the Show Society installed drainage pipes under the two inner ovals and planted salt tolerant grasses. The drainage pipes are 1.2 metres underground and 7 metres apart. After rainfall these pipes reduce water logging by draining excess water from the soil. The salty groundwater from these pipes initially flowed into to the Murrumbidgee River via stormwater drains.

The basin was built in response to NSW Government regulations preventing salty water being discharged to the river. Funding for the evaporation basin project came from the Environmental Trust ($80,000), the Environmental Protection Agency ($10,000) and Wagga Wagga City Council ($200,000).

The area drained by underground pipes is 2.5 hectares. The basin has two sections. The larger basin is primarily for salty water storage and some evaporation. It has an area of 0.5 hectares and is 1.7 metres deep. The smaller, shallower basin is designed to enhance water evaporation and allow for salt removal by earth moving machinery as needed. Its storage capacity is 300 cubic metres. The evaporation basin is designed only to handle the volume of water from the Showground arena.

Final stop - Emblen Park

What you will see here;
* Emblen Park demonstration gardens
* Intensive Bore Field

Emblen Park is a demonstration site for water-wise and salt tolerant gardening where, it is hoped, residents can draw inspiration for their own gardens. It is also a site where people can learn more about the impacts of salinity and what management strategies are in place.

The park includes garden beds with salt tolerant plant species and synthetic lawn. The idea behind using the synthetic lawn is to demonstrate that we can still have nice areas to enjoy in our backyard – but without the need to use large amounts of water. It also means less maintenance because no mowing, fertilizing or weeding is required!

Also located within Emblen Park are 5 piezometers and 1 of the 9 pumping bores that remove excess groundwater from this area.

Emblen Park in central Wagga Wagga has been designed using waterwise principles

Background Information- Emblen Park

The Emblen Park demonstration site is located in a discharge area – where groundwater is close to the soil surface. Wagga Wagga City Council established this site to help those living in this discharge areas where water logging and salty soils would otherwise be a problem. Emblen Park also provides examples of plants that suit these conditions. Finding grasses that can deal with both high traffic and salinity proved difficult. This is the reason why the lawn area has been replaced by synthetic grass. Could you tell it wasn't real on first glance?

The park is watered with groundwater pumped from the de-watering bore into the park's water tank. Drip irrigation is used to water the plants. This system is set to a timer and is watered 2 – 3 times a week.

In November 1999 the nine dewatering bores were switched on. The bores aim to lower the watertable and reduce the damaging affects of salinity and waterlogged soil in the area bounded by Cullen Road, Docker Street, Chaston Street and Edward Street.

Background Information - De-watering bores

The aim of the de-watering bores is to lower the watertable so that it is maintained between 3 and 5 metres below the surface. At that depth it will not affect the soil surface or underground services.

The bores pump from an aquifer 40-65 metres underground where the groundwater is less salty than water closer to the soil surface. This water may be safely piped to and released into the river.

As water is removed from depth, water closer to the surface falls to make up for this loss at depth lowering the water table in this location.

As a management strategy, the intensive bore field was a trial to determine;

- Effectiveness of groundwater pumping in lowering the watertable
- Changes to groundwater salinity with pumping over time
- Pumping rates needed to lower the watertable
- Establishment and running costs.

The de-watering bores were trialed in this part of Wagga Wagga as it is a discharge area.

Discharge areas are usually in the lower parts of the landscape where the watertable is close to the soil surface.

Left: drilling a de-watering bore at Emblen Park in 1999

Right: Pump and storage tank at Emblen Park

How much water is pumped into the river?

Wagga Wagga City Council presently holds an extraction licence to pump water from the borefield to the Murrumbidgee River.

Over the past 3 years, the average annual discharge from de-watering bores into the Murrumbidgee River was 110 megalitres, which is equivilent to 110 olympic size swimming pools.

How does this affect the river?

Groundwater that enters the river is monitored to ensure that the water is not too salty. Over the past 3 years, the average salt load discharges into the river was 158 tonnes per year.

Alternative methods of disposal have been investigated and at this time pumping to the river is the most suitable option. But this should not be viewed as a long term solution.

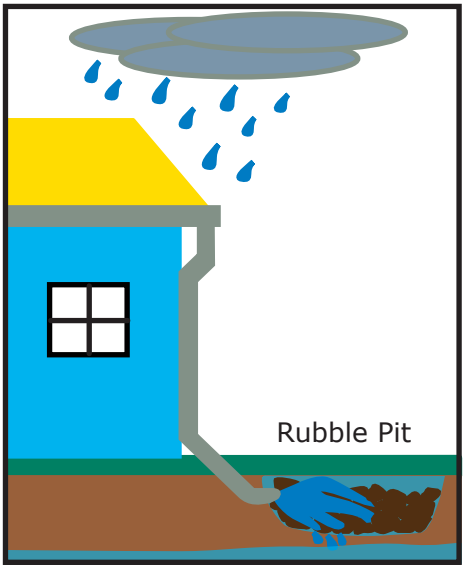
Background information - Rubble Pits

Rubble pits are rubble filled holes in the ground used to dispose of rainwater from rooves in areas where stormwater connections do not exist. Rubble pits are usually located in the backyards of houses in older parts of residential Wagga Wagga. Over time the rubble pit empties as the water soaks into the ground, contributing to a rise in the water table.

Extensive work has been carried out to provide alternative stormwater disposal by providing new stormwater pipes that connect to a new stormwater drainage system. Wagga Wagga City Council now prohibits the installation of new rubble pits.

The cost of disconnecting rubble pits and connecting to the stormwater drainage system is approximately $5,500 per house. Most works have been carried out with funding from the Murrumbidgee Catchment Management Authority and Wagga Wagga City Council.

Downpipe diverts rainwater directly from the gutter to a subsurface pit where water easily seeps into the watertable



Education

Education is a vital factor in urban salinity management. Urban salinity is a community issue as well as an individual issue. Wagga Wagga City Council aims to educate the community and promote behaviour change.

Some simple changes include;

- Don't over water your garden – a good water twice a week will keep your lawn alive
- invest in a tap timer to ensure you don't accidentally leave irrigation systems running longer than necessary
- Try adding some native plants to your garden – these also use less water and attract native animals and insects to your garden
- Use mulch to keep moisture in the soil longer which means you can water your garden less
- Design your own waterwise garden with minimal lawn
- Check for leaks from pipes and swimming pools regularly
- Join a local Landcare group to participate in local rehabilitation works.

Volunteers planting trees to help rehabilitate our land

Further Information

Urban Salinity Status Reports are available on the Wagga Wagga City Council website through the Environment section.

www.wagga.nsw.gov.au

www.riverina.lls.nsw.gov.au

www.environment.nsw.gov.au

www.dpi.nsw.gov.au

Keep up to date with environmental initiatives in Wagga Wagga and join the Sustainable Wagga Wagga facebook page

Thank you for your participation!

Glossary

Aeolian salt
salt transported by the wind

Aquifer
A saturated layer of rock or sediment that allows water to move through it

Baseflow
Groundwater that releases into surface waterways including lakes, rivers and creeks

Catchment
The area of land drained by a river and its tributaries

Discharge area
An area where groundwater is released to a land surface or water body

Electrical conductivity
The ability of a substance to conduct electricity which is the most convenient method or measuring salinity levels in water

Groundwater
Water that is located beneath the surface of the earth

Piezometer
A monitoring bore that allows measurement of groundwater

Recharge area
An area where water can enter the groundwater system

Rubble pit
A hole in the backyard where roof water is drained as a means of disposal

Salinity
The excessive accumulation of salts in land and water

Water table
The upper limit of groundwater and the level below which is permanently saturate with water

Source: Adapted from the 'Salinity Glove Box Guide' NSW Murrumbidgee Catchment

Notes

Notes

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