

Groundwater & Salinity Definitions & Terms

This fact sheet explains the meaning of various names, terms, abbreviations and language used when dealing with ground water and salinity.

Aquifers

The saturated area beneath the water table is called an aquifer, which stores water. When a water-bearing rock readily transmits water to wells, bores and springs, it is called an aquifer. Bores can be drilled into the aquifers and water can be pumped out.

Confined and Unconfined aquifers

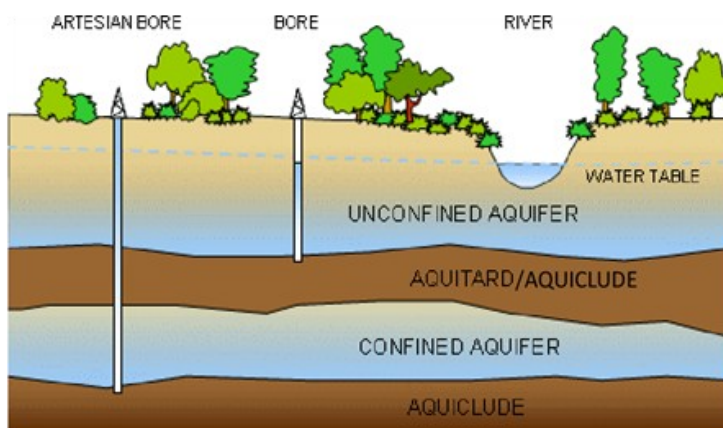
Confined aquifers (usually called the bottom layer of water) are permeable (porous) rock units that are usually deeper under the ground than unconfined aquifers. They are overlain by relatively impermeable rock or clay that limits groundwater movement into, or out of, the confined aquifer.

Groundwater in a **confined aquifer** is under pressure and will rise up inside a borehole drilled into the aquifer.

Confined aquifers may be replenished, or recharged by rain or stream-water infiltrating the rock at some considerable distance away from the confined aquifer. Groundwater in these aquifers can sometimes be thousands of years old.

Unconfined Aquifers (usually called the top layer of water) is where groundwater is in direct contact with the atmosphere through the open pore spaces of the overlying soil or rock. The upper groundwater surface in an unconfined aquifer is called the water table. The depth to the water table varies according to factors such as the topography, geology, rainfall, season, and the quantities of water being pumped from the aquifer.

Unconfined aquifers are usually recharged by rain or stream-water infiltrating directly through the overlying soil.



Groundwater

When rain falls, some of it flows across the surface of the land and accumulates in creeks, wetlands, and eventually the ocean. But some of the water seeps into the ground and accumulates within cracks or pores in the rocks (aquifers), forming groundwater resources, which in turn also eventually flow into surface water or the ocean.

Artesian flow

An artesian is where water flows out of the borehole under natural pressure.

Salinity

The term "salinity" refers to the concentrations of salts in water or soils. Salinity can take three forms, classified by their causes: primary salinity (also called natural salinity); secondary salinity (also called dryland salinity), and tertiary salinity (also called irrigation salinity).

Dryland salinity

Dryland salinity is the build-up of salt in surface soil in non-irrigated areas, usually because of rising groundwater tables. Groundwater seeps to the surface, bringing salt with it. As the soil surface dries out, salt is left behind

Water Connect

Interactive map and search tool for viewing information about the State's wells with access to well details including, graphs showing water salinity and water level. It provides a variety of search methods, including filtering the results. Other features include, downloading data, printing search results summary or map, viewing map layers, e.g. prescribed regions.

<https://www.waterconnect.sa.gov.au/Systems/GD/Pages/Default.aspx>

Obswell

Obswells is the name given to the Department for Environment & Water's groundwater observation wells that have water level records for varying periods of time. These are available on the Water Connect web site.

Obswell sites were selected in each focus area based on the reliability of the record. Unfortunately there is very limited data available in the Tintinara West / Colebatch area.

Bores

There are actually 2 parts to a bore water supply, the bore (some people also call it a well) and the bore pump. In simple terms, a bore is a hole drilled in the ground that fills up with groundwater that can then be pumped out to use for various things.

Well—(Landscape SA Act2019)

- an opening in the ground excavated for the purpose of obtaining access to underground water; or
- an opening in the ground excavated for some other purpose but that gives access to underground water; or
- a natural opening in the ground that gives access to underground water;

Wedge holes & groundwater access trenches

Landscape SA Act section 104(3)(a) and (b)

- The maximum depth is 2.5 metres otherwise it is considered to be a well.
- Stock access should be excluded by the construction & maintenance of a fence.
- Flow of surface water into groundwater access trench / wedge hole should be stopped by building a wall/bund around the underground water access trench at least 500mm high.
- All new groundwater access trenches must be maintained in a manner that prevents contamination of the water resources.

Salinity monitoring

Monitoring bore water quality is important for identifying:

- Shandyng, checking salinity levels in blended livestock water.
- Livestock health.
- Extreme salinity levels.
- Identifying bore casing failure.



Piezometers

Piezometers and monitoring wells are pipes that allow water to rise and fall as a way of measuring the level of groundwater.

Groundwater hydrographs

Long term records of ground water levels measured in each of the wells in the network form the database.

Water levels in aquifers fluctuate in both a long and short term sense, primarily in response to changes in precipitation and/or pumping.

A plot of these fluctuations through time is called a hydrograph.

Rainfall data can also be added to the hydrograph to plot seasonal variability

Salinity meters

If you find yourself considering these challenges regularly perhaps it is time to consider purchasing your own Electrical Conductivity (EC) meter to measure the salinity of your water.

- What is the quality of the water my livestock are drinking?
- Why has there been an increase or decrease in my stock water consumption?
- How do I keep my livestock healthy?
- What is the salinity level in my bores, wedge holes, tanks and troughs?

Pocket sized meters are available which are appropriate for use around the farm and are easy to use and not expensive.



Salinity units

It is usually measured as electrical conductivity (EC units) which is an indicator of total dissolved salts (TDS) in the water, which is referred to as parts per million (ppm).

Be careful not to get confused with different salinity measuring units. EC units & parts per million are the most common units.

The Coorong Tatiara LAP has a **Salinity Unit Conversion Slide Chart** which is available free from the Council Offices on request.

Groundwater Recharge and Discharge

Recharge is commonly expressed as the amount of water which fills an aquifer over a given period of time, and is usually measured in millimetres-per-year. Discharge represents the outflow of groundwater from underground aquifers.

Understanding & Accessing Groundwater Fact Sheet

<https://www.coorong.sa.gov.au/council-services/coorong-tatiara-local-action-plan/water-security/groundwater-resources>

This fact sheet covers:

- groundwater, •confined & unconfined aquifers, •monitoring,
- checklist for drilling a bore, •regulatory requirements,
- construction requirements for bores, •fire water,
- calculating livestock water needs, •livestock water quality
- salinity & salinity measurement units, •water quality,
- water savings options, •groundwater contamination.

Coorong Tatiara Local Action Plan

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<https://www.coorong.sa.gov.au/council-services/coorong-tatiara-local-action-plan/water-security>



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