

# On-farm water checklist

LANDSCAPE SOUTH AUSTRALIA NORTHERN AND YORKE

# Disclaimer

Water resources in the Northern and Yorke region are precious andneed to be managed sustainably.

The region is divided into Prescribed and Non-Prescribed water areas. In Prescribed areas, there are regulations in place to ensure responsible, fair, and equitable water allocations for communities, industry and water dependant ecosystems.

**Department for Environment and Water:**
"To manage South Australia's water resources sustainably, we issue water licences, allocations and permits, and have rules on water use and trading.

Many of our waterways and groundwater resources are 'prescribed water resources'. In prescribed water resource areas, a water licence is required to take water for most purposes and **water allocation plans** | **www.environment.sa.gov.au/topics/water-and-river-murray/projects-plans-and-security/water-security/water-allocation-plans** are developed with local communities to define sustainable limits and the rules around how water may be used or taken".

In **all parts of the region** "Drilling wells (bores) to access groundwater requires a Well Construction Permit and work must be done by a licensed driller".

Please visit the website for further information: **Department for Environment and Water - Water licence and permit forms** | **www.environment.sa.gov.au/licences-and-permits/water-licence-and-permit-forms**

**Northern and Yorke Landscape Board:**
Some activities can have adverse impacts on the health and condition of watercourses and catchments and the ecosystems that depend on them, as well as on other water users. These are called Water Affecting Activities (WAA). Eg works in water course or floodplains, collection/diversion structures.

Some WAA require a permit **prior to undertaking the activity**.

Contact your local Landscape Board office for more information on Water Affecting Activities before undertaking any works.
**Landscape South Australia - Northern and Yorke | Water affecting activities | www.landscape.sa.gov.au/ny/water/water-affecting-activities**

*This resource is supported by funding from the Landscape Priorities Fund and the South Australian Drought Hub through the Australian Government's Future Drought Fund.*

Australian Government
Department of Agriculture, Fisheries and Forestry
Future Drought Fund
SA DROUGHT HUB

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For more information on water resources, allocations and regulations for landholders in the Northern and Yorke region, visit www.landscape.sa.gov.au/ny or contact your local office:

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# Water in the Northern and Yorke region

The Northern and Yorke region comprises a varied and productive portion of South Australia's landscape. The **region encompasses** the **Yorke Peninsula**, substantial areas of the **Spencer Gulf** and **Gulf St Vincent**, the **southern Flinders Ranges**, parts of the **Rangelands**, the **Mid North**, the **northern Mount Lofty Ranges**, the **Barossa** and the **northern Adelaide Plains**.

Agriculture dominates ~80% of the region, with commodities including cereal and pulse grains, oilseeds, meat and fibre, aquaculture products, fruits and vegetables, and wine.

Water is the most precious natural resource, and water security is an ongoing concern across the region, especially for agricultural communities. On-farm water capture, storage, efficiency and cost are central to a farming businesses' success and long-term viability.

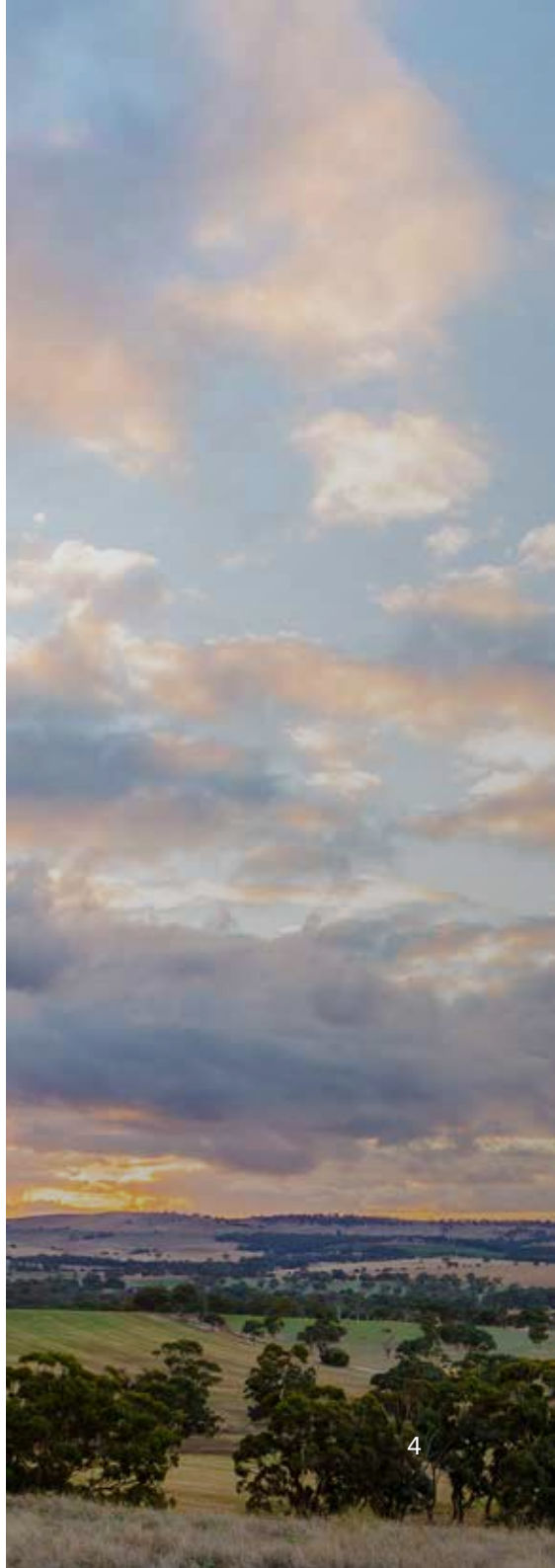
Decreased availability and declining quality of groundwater and surface water and reduced on-farm water storage have all been observed across the Northern and Yorke region, particularly in the Upper North and Rangelands following several dry years.

Climate modelling suggests that in the next 30 years, farmers will be faced with increased water demand and heat stress risk in livestock, damage to yield and quality of crops and pastures, and increased numbers, range and migration of pest plants and animals, resulting from warming temperatures (DEW 2022). Extreme rainfall events are projected to become more common, threatening captured water quality and infrastructure damage (DEW 2022).

Understanding your farm's water requirements and planning accordingly is one step you can take to improve your drought preparedness and resilience.

This checklist is designed to assist you in calculating how much water you need, and assessing whether there are any changes you could make to improve your overall water storage capacity, capture, and efficiency.

You can use this guide to calculate your water requirements over an entire year, or just over the summer period.



# Conversions and other useful information

This guide will use the units litres (L), kilolitres (kL) and megalitres (ML).

Litres and kilolitres are generally used for small to medium volumes of water, for example household or livestock usage. Megalitres is generally used for large volumes such as dams and catchments.

You can easily convert between these units to use the one that suits you best.

| Starting unit | Converting to | Conversion |
|---|---|---|
| mL | L | ÷1000 |
| L | kL | ÷ 1000 |
| L | ML | ÷1,000,000 |
| kL | ML | ÷1000 |
| ML | kL | ×1000 |
| ML | L | ×1,000,000 |
| kL | L | ×1000 |
| L | mL | ×1000 |

1 cubic metre equals 1000 L (1kL)

# How many days in the seasons?

In some instances, you may want to calculate your water usage only during certain seasons – for example you may only water your garden during summer or put a certain number of stock on saltbush to fill an autumn feed gap.

**The number of days per season**
(based on a calendar year):



| Summer | Autumn | Winter | Spring |
|---|---|---|---|
| 90 | 91 | 92 | 91 |



# Section 1.
# Work out your water requirements

## Step 1. Household requirements

If your household needs are met with mains water, skip this step.

Refer to Table 3 for average daily water requirements. If you already know your own household water usage, use that number instead.

### Table 1. Household water requirements

| Water usage | | Water requirement per day | Total water required per day for household | Number of days | Annual water requirement (L) | Notes |
|---|---|---|---|---|---|---|
| | A | B | C = A × B | D | = C × D | |
| No. of residents | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Total water requirement (L) | | | | | | Add all above numbers |
| Total water requirement (kL) | | | | | | Divide litres by 1000 |

**Table 2. Garden water requirements**

| Garden type (lawn, shrubs, native) | Garden area ($m^2$) | Water requirement per year (L) | Annual water requirement (L) | Notes |
|---|---|---|---|---|
| A | B | C | = B × C | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| Total water requirement (L) | | | | Add all above numbers |
| Total water requirement (kL) | | | | Divide litres by 1000 |

Values provided are estimates only. If you have your own garden water usage values (per year or per day), use those instead.

**Table 3. Average household water requirements for South Australia**

| | Average daily water use (L) | |
|---|---|---|
| Daily use per resident[1] | 125 | |
| | | |
| | Water allowance (L) per m² averaged over the year | |
| | Rainfall <500 mm/year | Rainfall > 500 mm/year |
| Lawn with shrubs[2] | 450 | 300 |
| Native garden[2] | 150 | 100 |
| Vegetable garden[2] | 900 | 600 |



# Step 2. Livestock requirements

Refer to Table 5 for livestock water requirements.

### Table 4. Livestock water requirements

| Livestock class | Number of stock | Average daily intake (L) | Number of days | Annual intake (L) | Notes |
|---|---|---|---|---|---|
| | A | B | C | = A x B x C | Calculate for the number of days you are interested in – for example, only summer, or annual. |
| | | | | | |
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| | | | | | |
| | | | | | |
| Total water requirement (L) | | | | | Add all above numbers |
| Total water requirement (kL) | | | | | Divide litres by 1000 |

## Table 5. Average water requirements for sheep and cattle

| Class | Long-term average demand (L/day)[3] | Maximum summer demand (L/day) [3] |
|---|---|---|
| Dry mature sheep | 5.0 | 10.0 |
| Lambs | 2.5 | 5.0 |
| Lactating ewes | 7.0 | 14.0 |
| Dry sheep on saltbush | 8.0 | 12.0 |

| Class | Long-term average demand (L/day)[3] | Maximum summer demand (L/day)[3] |
|---|---|---|
| Weaners | 50.0 | 70.0 |
| Beef cattle | 71.0 | 100.0 |
| Lactating cow | 100.0 | 120.0 |
| Cattle on saltbush | 105.0 | 140.0 |





# Deeper dive - water quality, quantity and supply for livestock

### Water quality requirements for livestock

For water quality requirements for sheep, cattle, pigs and poultry, see the Appendix.

### Water quantity requirements of livestock grazing saltbush

Saltbush is a good source of out-of-season feed, particularly in low-rainfall environments. The commonly used species can contain high levels of salts, made up of sodium, chlorine and potassium.

Livestock grazing saltbush require more water to flush the excess salts from their system. The quality and quantity of water needed depends on the proportion of the animal's diet made up of saltbush.

For more information and guidelines to calculate your livestock's total salt consumption, visit:

https://library.dpird.wa.gov.au/ap_factsheets/9
(click "download")

## Water supply for livestock

Livestock should always have access to an adequate supply of clean, good quality water. Trough systems are recommended rather than open sources such as dams or waterways. This is because open sources can become contaminated by animal waste, pose a risk of stock injury or death and are vulnerable to soil and vegetation degradation by livestock (which can further pollute the water source). Troughs provide a cleaner, more easily monitored water source. Livestock drinking cleaner water have better health outcomes and are more productive.



## A good trough system should:

- Provide sufficient access area to allow all stock to drink regularly.
- Be strong and durable.
- Allow for easy and regular cleaning and prevent manure accumulation underneath.
- Allow for easy pipe and fittings maintenance.
- Not cause wet areas or waterlogging at the base. A concrete pad is recommended to avoid pugging, which reduces health risks related to bacteria and parasites, particularly in sheep.
- Be centrally located and have enough troughs to reduce the walking distance required for water. Livestock should not need to walk more than 1.5 km for water.
- Allow for access to shade while drinking. Livestock can drink up to 40% more during summer. Shade at or near the trough helps the animals to regulate body temperature and prevents camping in other areas further from the watering point.
- Avoid areas with high erosion potential, or in areas with remnant vegetation.

Thoughtful trough placement can benefit pasture utilisation. Livestock preferentially graze pastures which are close to watering points. Locating troughs centrally, or providing more troughs in larger paddocks, encourages livestock to graze a wider area and helps prevent overgrazing.
remnant vegetation.

### Understand your flow rate

Adequate flow rate keeps the drinking water cooler and prevents troughs becoming empty which also keeps them cleaner for longer. If flow rate is sufficient, longer troughs are unnecessary. Flow rate will depend on distance to the water source, elevation change, pumping equipment and infrastructure capacity.

A rule of thumb for sheep is to provide one metre of trough (with access on both sides) per 100 sheep; troughs should store ~100 L per metre of trough; and flow rate into the trough should be ~1 L/second per 300 sheep.

For more information on watering system design and livestock water management, including for feedlots, see:

*www.mla.com.au/globalassets/mla-corporate/research-and-development/program-areas/feeding-finishing-and-nutrition/feedlot-design-manual/020-water-trough-design-and-sewer-systems-2016_04_01.pdf*

*https://library.dpird.wa.gov.au/cgi/viewcontent cgi?article=1011&context=ap_factsheets*



# Step 3. Native animal water use

Complete this step if kangaroo pressure is an issue on your property. Use Table 6 and Table 7 to estimate water usage by kangaroos or use your own values if you have them. Note that kangaroo density is difficult to quantify. These calculations are estimates only and are not intended to be used as otherwise. If you know what your kangaroo population density is, use your own numbers.

**Table 6. Native animal water use**

| Property size (ha) | Property size ($km^2$) | Estimated kangaroo pressure (head/$km^2$) | Number of days accessing water | Total water usage per year (L) | Notes |
|---|---|---|---|---|---|
| A | B = A ÷ 100 | C | D | = B × C × D | |
| | | | | | |
| | | | | | |
| | | | | | |
| Total water requirement (L) | | | | | Add all above numbers |
| Total water requirement (kL) | | | | | Divide litres by 1000 |



**Table 7. Kangaroo population densities in the Northern and Yorke region and water intake**

| Kangaroo population density (kangaroos per km²)[4] | | | | |
|---|---|---|---|---|
| Species | Upper North | Yorke and Mid-North | Southern | Estimated water intake per day (L)[5] |
| Red kangaroo | 13.3 | 0.4 | - | 1 |
| Western Grey | 11.9 | 8.8 | 11.9 | 1 |
| Euro | 25.4 | 4.9 | - | 1 |
| TOTAL | 50.6 | 14.1 | 11.9 | |

# Step 4. Pest animal water use

Complete this step if pest pressure is an issue on your property. Use Table 9 for water intake estimates for goats or use your own values if preferred. Use the extra spaces to input any other pest species you want to factor.

**Table 8. Pest animal water use**

| Species/class | Estimated density (head) | Water intake per day (L) | No. of days accessing water | Annual water intake (L) | Notes |
|---|---|---|---|---|---|
| | A | B | C | = A x B x C | |
| | | | | | |
| | | | | | |
| | | | | | |
| Total water requirement (L) | | | | | Add all above numbers |
| Total water requirement (kL) | | | | | Divide litres by 1000 |

**Table 9. Feral goat water intake**

| Class | Estimated water intake (L/day)[6] |
|---|---|
| Dry doe | 3-4 |
| Breeding doe | 4-6 |
| Weaner | 2-4 |
| Buck | 6-8 |



# Step 5. Other on-farm water use

Spraying

**Table 10. Spraying water requirements**

| Crop type | No. of hectares | Spray rate (L/ha) | Number of spray passes per year | Spraying water requirement (L) | Notes |
|---|---|---|---|---|---|
| A | B | C | D | = A × B × C | |
| | | | | | |
| | | | | | |
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| | | | | | |
| | | | | | |
| Total water requirement (L) | | | | | Add all above numbers |
| Total water requirement (kL) | | | | | Divide litres by 1000 |

Firefighting

**Table 11. Firefighting water requirements**

| Spray tank volume (L) | Estimated no. of tanks per season (L) | Firefighting water requirement (L) | Notes |
|---|---|---|---|
| A | B | = A x B | |
| | | | |
| | | | |
| | | | |
| Total water requirement (L) | | | Add all above numbers |
| Total water requirement (kL) | | | Divide litres by 1000 |

Your property may be required to store a certain volume of water to comply with bushfire safety standards. This requirement depends on your location's bushfire risk. For more information visit the CFS website | www.cfs.sa.gov.au

Other water usage

**Table 12. Other water requirements**

| Water use | Total water requirement (L) | Notes |
|---|---|---|
| | | |
| | | |
| | | |
| Total water requirement (L) | | Add all above numbers |
| Total water requirement (kL) | | Divide litres by 1000 |

# Step 6. Calculate total water requirements for your property

**Table 13. Total property water requirements**

| Water usage | Water requirement (L) | Water requirement (kL) | Notes |
|---|---|---|---|
| | Totals calculated on previous pages | Totals calculated on previous pages | |
| Household (pg. 7) | | | |
| Livestock (pg. 9) | | | |
| Native animals (pg. 14) | | | |
| Pest animals (pg. 16) | | | |
| Spraying (pg. 18) | | | |
| Firefighting (pg. 19) | | | |
| Other (pg. 19) | | | |
| Total property water requirement | | | |
| Total property water requirement (ML) | | | Divide above number by 1000 |

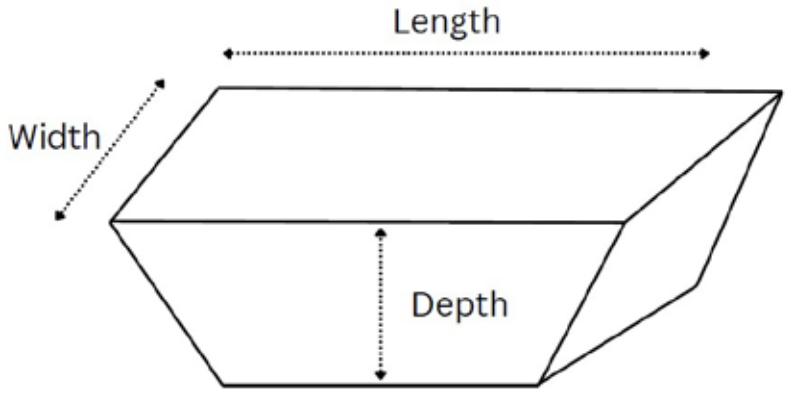


# Section 2.
# Calculate your water storage

# Step 1. Dam and tank storage

All calculations assume an internal wall slope (batter slope) of 3:1, which is considered standard. These calculations will likely underestimate water volume – for more accurate calculations see the Appendix.

Calculations sourced from Department of Primary Industries and Regional Development: *www.dpird.wa.gov.au/environment-and-sustainability/water/dams/calculating-farm-dam-excavated-earth-tanks-water-volume*

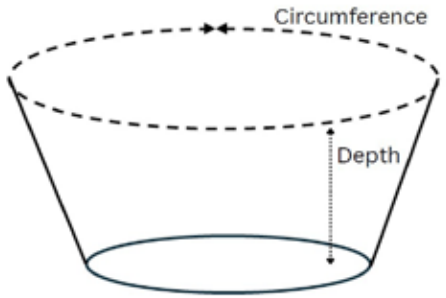



Volume ($m^3$) = surface area ($m^2$) × maximum depth (m) × 0.4

Example: a dam with a water edge 40 m long and 30 m wide, and a maximum depth of 5 m:

Surface area = 40 m × 30 m = 1200 $m^2$
Volume = 1200 $m^2$ × 5 m × 0.4 = 2400 $m^3$
Volume = 2400 kL or 2.4 ML



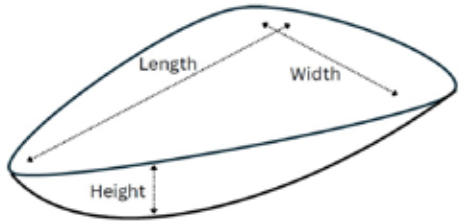



## Round dams

Surface area ($m^2$) = Circumference$^2$ ÷ (4 × π)
Where π = ~3.142
Volume ($m^3$) = surface area ($m^2$) × maximum depth (m) × 0.4

*Example: a dam with a circumference of 150 m, and a maximum depth of 6 m:*

*Surface area = 1502 ÷ (4 × 3.142) = 22,500 ÷ 12.57 = 1,789 $m^2$*
*Volume = 1789 $m^2$ × 6 m × 0.4 = 4295 $m^3$*
*Volume = 4295 kL or 4.3 ML*

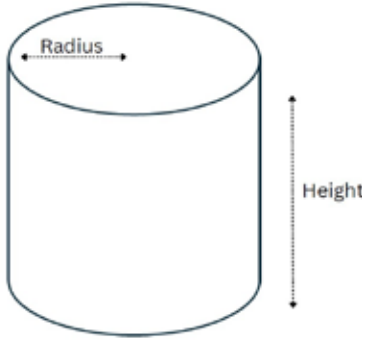



## Gully dams

Surface area ($m^2$) = Length × width × 0.5
Volume ($m^3$) = surface area ($m^2$) × maximum depth (m) × 0.4

*Example: a dam with a length of 40 m, a width of 20 m and a maximum depth of 5 m:*

*Surface area = 40 × 20 × 0.5 = 400 $m^2$*
*Volume = 400 $m^2$ × 5 m × 0.4 = 800 $m^3$*
*Volume = 800 kL or 0.8ML*




## Tanks

Surface area ($m^2$) = π × $r^2$ (where π = 3.142 and r = radius)
Volume ($m^3$) = surface area ($m^2$) × height (m)

*Example: a tank with a radius of 1.5 m and a height of 3.0 m:*

*Surface area = 3.142 × 1.52 = 3.142 × 2.25 = 7.0 $m^2$*
*Volume = 7.0 $m^2$ × 3.0 m = 21.0 $m^3$*
*Volume = 21,000 L or 21 kL*

**Table 14. On-farm dam water storage**

| Dam name | Length (m) | Width (m) | Surface area ($m^2$) | Depth (m) | Volume ($m^3$ / kL) | Volume (ML) |
|---|---|---|---|---|---|---|
| | A | B | C = A × B | D | E = C × D | G = E ÷ 1000 |
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| | | | | | | |
| Total dam volume for property | | | | | | |



## Dam water losses – Evaporation, seepage and pumping difficulties

### What is pan evaporation?

Pan evaporation is measured using an evaporation pan – an open metal pan of a known size. Water is set daily to a fixed depth, by adding water or removing water following rainfall. The change in depth at the end of each day, allowing for rainfall, is the daily evaporation. Pan evaporation is measured in millimetres and measures the most severe level of evaporation in any given area, as there is no shade or groundcover to protect the water surface. Hotter, drier climates and high sun exposure will result in greater pan evaporation measurements.

Use **Table 26 (Appendix)** to find the pan evaporation for your nearest locality.

### How much water is lost to seepage and pumping inefficiencies?

Most dams will lose water through seepage, the amount dependant on the materials and compaction methods used in construction. Additionally, water left in nearly empty dams is more difficult to pump out (typically the last 0.5 m). As a rule of thumb, 10% of the dam volume is lost due to seepage and pumping difficulties.

Use **Table 15** to calculate the remaining dam volume following these losses.

**Table 15. On-farm dam volume**

| Dam name | Volume (kL) | Seepage and pumping losses (kL) | Annual pan evaporation (mm) | November – April rainfall (mm) | Surface area ($m^2$) | Estimated evaporation (kL) | Remaining volume (kL) | Notes |
|---|---|---|---|---|---|---|---|---|
| | A | B = A × 0.1 | C | D | E | F = (C-D) × E ÷ 1000 | G = A – (B + F) | |
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| Total remaining volume (kL) | | | | | | | | Add all above numbers |
| Total remaining volume (ML) | | | | | | | | Divide kL by 1000 |

**Table 16. On-farm tank storage**

| Tank name | Radius | Height | Surface area ($m^2$) | Volume ($m^3$ / kL) | Notes |
|---|---|---|---|---|---|
| | A | B | $C = \pi \times A^2$ | $= C \times B$ | |
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| | | | | | |
| Total tank volume | | | | | |

# Step 2. Bore water supply

**Table 17. Bore water supply**

| Bore name | Flow rate (L/minute) | Usable hours per day | Litres per day | Days used per year | Annual yield (L) | Annual yield (kL) | Notes |
|---|---|---|---|---|---|---|---|
| | A | B | C = A × 60 × B | D | E = C × D | F = E ÷ 1000 | |
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| | Total yield | | | | | | Add all above numbers |
| | Total yield (ML) | | | | | | Divide kL by 1000 |

# Step 3. Other water supplies

Use Table 18 to record water supplies from any other sources. If you do not know the volume supplied (for example, for livestock watered by a stream or river for a few days in summer) then record the number of days used.

**Table 18. Other farm water supplies**

| Water source | Water supply (L) | Water supply (kL) | Notes |
|---|---|---|---|
| | A | B = A ÷ 1000 | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| Total water supply | | | Sum all above numbers |

# Step 4. Calculate total property water storage and supply

**Table 19. Total property water storage and supply**

| Water storage | Storage/ supply capacity (L) | Storage / supply capacity (kL) | Notes |
|---|---|---|---|
| | A | B = A ÷ 1000 | |
| Dams (pg. 26) | | | |
| Tanks (pg. 27) | | | |
| Bores (pg. 28) | | | |
| Other (pg. 29) | | | |
| Total storage capacity | | | Add all above numbers |
| Storage capacity ML | | | Divide kL by 1000 |



# Section 3.
# Calculate your water capture potential

# Step 1. Roof surfaces (sheds, residential, etc.)

**Table 20. Roof surface water capture**

| Roof name | Length (m) | Width (m) | Surface area (m2) | Annual rainfall (mm) | Annual rainfall capture potential (L) | Annual rainfall capture potential (kL) | Notes |
|---|---|---|---|---|---|---|---|
| | A | B | C = A × B | D | E = C × D | F = E ÷ 1000 | |
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| | | | | | | | |
| Total water supply | | | | | | | Add all above numbers |
| Total water supply (ML) | | | | | | | Divide kL by 1000 |

# Step 2. Catchment area supply (optional)

Use Tables 21 and 21 to calculate water capture from any catchments on your property.
You can also use this step to compare catchment yields from different materials.

**Table 21. Catchment area water supply**

| Catchment name | Area of catchment (ha) | Rainfall (mm) | Soil/material type | Runoff coefficient | Catchment yield (kL) | Catchment yield (ML) |
|---|---|---|---|---|---|---|
| | A | B | C | D | E = A × B × D × 10 | F = E ÷ 1000 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| Total property catchment yield | | | | | | |

**Table 22. Catchment area water capture and efficiency**

| Average annual rainfall (mm) | Total annual evaporation (mm) | Runoff as a percentage of average annual rainfall[7] | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Shallow sands or loam soils | Sandy clays | Elastic clays | Clay pans, inelastic clays or shales | Roaded/ graded | Plastic or bitumen | Uncleared |
| **401 – 500** | 1300 - 1800 | 1.5-3 | 3-6.5 | 1.5-3.0 | 5.0-8.0 | 25 | 75 | 0.5 |
| **250 – 400** | Less than 1800 | 0-1.5 | 0-3.0 | 0-1.5 | 1.5-5.0 | 5 | 75 | 0.5 |
| | More than 1800 | 0 | 0-1.5 | 0 | 1.5-3.0 | 5 | 75 | 0.5 |



# Section 4.
# Calculate your water balance

# Step 1. Compare your water demand to your water storage

**Table 23. On-farm water requirement and storage balance**

| Total water usage (kL) | Total water storage and supply (kL) | Number of days in season/year | Daily water consumption | Days water will last |
|---|---|---|---|---|
| A | B | C | D = A ÷ C | E = B ÷ D |
| | | | | |
| Total number of days water will last: | | | | |

# Step 2. Compare your water storage to your water supply

**Table 24. On-farm water supply and storage balance**

| Total water supply (kL) | Total water storage capacity (kL) | Difference (kL) |
|---|---|---|
| Table 18 | Table 19 | +/- |
| | | |

# Step 3. Assess your options

Use Table 25 to consider your options to improve on-farm water storage, use or capture.

**Table 25. On-farm water improvement options**

| Practice | Yes | No | Notes | Further information |
|---|---|---|---|---|
| Reticulated water systems | | | | https://agriculture.vic.gov.au/farm-management/water/farm-water-solutions/stock-perform-better-when-drinking-from-troughs<br><br>https://www.sustainablefarms.org.au/on-the-farm/farm-dams |
| Efficient water infrastructure | | | | https://agriculture.vic.gov.au/farm-management/water/farm-water-solutions/efficient-use-of-farm-water |
| Pest animal control | | | | https://www.landscape.sa.gov.au/saal/news/what-do-goats-cost-your-business<br><br>https://www.landscape.sa.gov.au/ny/plants-and-animals/pest-plants-and-animals/pest-animals |
| Containment feeding livestock | | | | https://cdn.environment.sa.gov.au/landscape/docs/hf/stock-containment-areas-fact-sheet_2024-02-01-012659_sxjg.pdf<br><br>https://agriculture.vic.gov.au/farm-management/land-and-pasture-management/stock-containment-areas-for-emergencies |
| Water testing for livestock | | | | https://www.landscape.sa.gov.au/ep/water/managing-water-resources/water-testing<br><br>https://agriculture.vic.gov.au/support-and-resources/newsletters/sheep-notes-newsletter/autumn-2026/water-quality-testing-for-livestock<br><br>https://library.dpird.wa.gov.au/ap_factsheets/12<br><br>https://agriculture.vic.gov.au/support-and-resources/newsletters/sheep-notes-newsletter/autumn-2016/testing-your-stock-water-is-critical-in-dry-seasons |

| Practice | Yes | No | Notes | Further information |
|---|---|---|---|---|
| Livestock class matched to water quality | | | | See appendix. |
| Shade and shelter for livestock | | | | https://agriculture.vic.gov.au/support-and-resources/newsletters/sheep-notes-newsletter/sheep-notes-autumn-2020/signs-and-management-of-heat-stress-in-sheep#h2-0 |
| Dam linings | | | | https://www.coorong.sa.gov.au/__data/assets/pdf_file/0031/1799230/Fact-sheet-Water-Harvesting-and-Lined-Catchments-11.02.2025.pdf#Water%20Harvesting%20and%20Lined%20Catchment%20Fact%20Sheet<br><br>https://www.dpird.wa.gov.au/environment-and-sustainability/water/dams/treating-leaky-farm-dams-in-wa/ |
| Dam covers | | | | https://www.gga.org.au/activity/watersmart-dams/ (see case studies)<br><br>https://www.coorong.sa.gov.au/__data/assets/pdf_file/0031/1799230/Fact-sheet-Water-Harvesting-and-Lined-Catchments-11.02.2025.pdf#Water%20Harvesting%20and%20Lined%20Catchment%20Fact%20Sheet |
| Revegetation around dams | | | | https://www.gga.org.au/activity/watersmart-dams/ (see case studies) |
| Lined or upgraded catchments | | | | https://www.gga.org.au/activity/watersmart-dams/ (see case studies)<br><br>https://www.coorong.sa.gov.au/__data/assets/pdf_file/0031/1799230/Fact-sheet-Water-Harvesting-and-Lined-Catchments-11.02.2025.pdf#Water%20Harvesting%20and%20Lined%20Catchment%20Fact%20Sheet |
| Shelterbelts and other vegetation around watercourses | | | | https://cdn.environment.sa.gov.au/landscape/docs/ny/revegetating-watercourses.pdf<br><br>https://www.sustainablefarms.org.au/on-the-farm/shelterbelts/ |
| Technology – e.g. water level monitoring devices | | | | https://biggroup.org.au/on-farm-water-technology/<br><br>https://cdn.environment.sa.gov.au/landscape/images/saal/FDF_SAAL-Water-FACTSHEET_Final_27.Jun2023.pdf |

# Step 4. Evaluate your water budget

Work through the following questions to assist you with evaluating your farm water budget

1. Do you have enough water storage for your farm's requirements? How many days will your water last?

2. What is your biggest water requirement? Were you surprised by any of the numbers?

3. Are you capturing as much rainfall as you can? Is there capacity to install more infrastructure (e.g. tanks or upgrading a catchment area) to increase your water harvest?

4. Are there any changes you can make to reduce your water requirements, improve your storage and supply, harvest more, or increase your water use efficiency?

5. What are the barriers preventing you from making changes? Do you know where to go for assistance?

# Appendix

1. Water quality requirements for livestock

**Table 26. Water quality (total dissolved solids, TDS) requirments for various classes of livestock**

| Livestock | Total dissolved solids (mg/L) | | |
|---|---|---|---|
| | No effect | Initial scouring. Animals will adapt. | Production losses and decline in animal health and condition likely. |
| Dry mature sheep[8] | 0-4,000 | 4,000-10,000 | 10,000-13,000 |
| Lambs[9] | | | 5,000-10,000 |
| Lactating ewes[3] | | | 3,800 |
| Beef cattle[8] | 0-4,000 | 4,000-5,000 | 5,000-10,000 |
| Poultry[8] | 0-2,000 | 2,000-3,000 | 3,000-4,000 |
| Pigs[8] | 0-4,000 | 4,000-6,000 | 6,000-7,000 |

For a comprehensive list of water quality requirements, see:
www.waterquality.gov.au/sites/default/files/documents/livestock-drinking-water-guidelines-draft.pdf

2. Calculating dam volumes

**Square or rectangular dam volume:**

$$V\ (ML) = (( L^T \times W^T ) + (L^B \times W^B ) + (( L^T + L^B ) \times (W^T + W^B ))) \div 6000 \times d$$

Where
$L^T$ = Top length (m)
$W^T$ = Top width (m)
$L^B$= Bottom length (m)
$W^B$ = Bottom width (m)
d = Depth (m)

This assumes a batter slope of 3:1 (i.e. for every 1 m depth increase, the dam sides slope in by 3 m).

**Circular dam volume:**

$$V\ (ML) = ( \pi R_T^2 ) + \pi R_B^2 ) + (\pi(R_T + R_B)^2 )) \div 6000 \times d$$

Where
$R_T$ = Top radius (m)
$R_B$ = Bottom radius (m)
d = Depth (m)
$\pi$ = ~3.14



**Table 27. Pan evaporation figures for South Australian locations. Source: Bureau of Meteorology**

| Location | Annual pan evaporatrion (mm) |
|---|---|
| Ardrossan | 1700 |
| Auburn | 1500 |
| Blyth | 1500 |
| Booleroo Centre | 1900 |
| Burra | 1900 |
| Carrieton | 2100 |
| Clare | 1500 |
| Crystal Brook | 1800 |
| Dublin | 1600 |
| Eudunda | 1900 |
| Gawler | 1500 |
| Jamestown | 1800 |

| Location | Annual pan evaporatrion (mm) |
|---|---|
| Kadina | 1700 |
| Kapunda | 1700 |
| Kulpara | 1700 |
| Laura | 1800 |
| Maitland | 1700 |
| Mallala | 1600 |
| Minlaton | 1700 |
| Mount Pleasant | 1500 |
| Orroroo | 1900 |
| Peterborough | 1900 |
| Port Broughton | 1800 |
| Port Pirie | 1800 |

| Location | Annual pan evaporatrion (mm) |
|---|---|
| Port Victoria | 1700 |
| Port Vincent | 1500 |
| Redhill | 1800 |
| Robertstown | 1900 |
| Roseworthy | 1500 |
| Snowtown | 1900 |
| Spalding | 1700 |
| Tanunda | 1500 |
| Warooka | 1600 |
| Williamstown | 1500 |
| Wilmington | 1900 |
| Yorketown | 1600 |

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