

MAP 9 – HYDROGEOLOGICAL INVENTORY



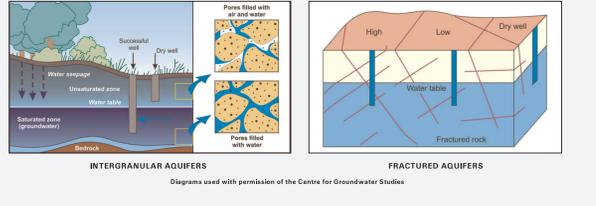
These maps are complementary to the 1:250 000 scale hydrogeological maps which use as a basis, a compiled 1:250 000 scale geology layer (derived from 1:25 000, 1:50 000, 1:63 360 scale geological maps together with some areas where only reconnaissance mapping is available). These 1:100 000 scale maps are easier to read and use the regional groundwater prospectivity boundaries from the 1:250 000 scale maps as background information in the absence of more detailed hydrogeological coverage across the whole State. They should be used in conjunction with the 1:250 000 scale maps and other more detailed hydrogeological maps and site specific reports, if available, as a preliminary to more intensive groundwater studies in a particular area. If additional projects are undertaken in targeted prioritised areas of the State, these maps can be further developed and made more site specific.

Boreholes shown on the map are those with locations mainly supplied by drillers and from location in the field by MRT staff. There are many open boreholes for investigation and production purposes in coastal and inland areas in Tasmania that may not be shown on these maps at this stage. Boreholes with yields >0.05 L/s have been considered as successful boreholes. Outputs of boreholes are those supplied by drillers and are mostly the result of short term pumping measurements. Some boreholes have been successful but outputs have not been reported. Boreholes reported as dry holes usually have a small unreported yield (<0.05 L/s).

Small elevated areas of any hydrogeological unit will usually have lower prospectivity because of limited storage and high drainage rates. In areas where there is little or no water bore data (e.g. Southern Tasmania), the groundwater prospectivity has been assumed to be similar to that in the areas where data are widely available. In areas of low rainfall, water quality can be poorer and water usage may be limited.

These maps provide some additional information to the 1:250 000 scale hydrogeological maps in that there are some subdivisions of Permian and Triassic age units. There is some difference in hydrogeological properties and prospectivity between these units. For example, the Upper Triassic fine sandstone, mudstone and coal measures has lower prospectivity and poorer quality groundwater than the Lower Triassic and Permian rocks in most locations. The three dimensional shade effect enabled users to understand the spatial relationships between adjoining geological units shown on the map and in some cases their relative thickness.

There is usually a degree of vertical stratification in the groundwater quality within the aquifers and results presented represent a composite value of salinity from drill holes at a particular site. Natural groundwater quality is influenced by annual rainfall and the evaporation (e.g. high rainfall, low evaporation areas tend to have better quality groundwater than low rainfall, high evaporation areas). The composition of the rock types through which the groundwater passes and is stored in and physical properties of the rocks such as permeability and porosity, human activities such as extensive groundwater pumping, pollution from various waste disposal activities and use of chemicals (agriculture, forestry, industry etc.) also may have negative effects on groundwater quality. The geology (including aquifer prospectivity), groundwater quality and the relationship between surface water, groundwater and rainfall are important considerations in resource and other groundwater related water studies. The attached average rainfall map can be used to make some general deductions about the possible link between the above-mentioned water balance factors. Climate has an effect on quantity and quality of low groundwater and surface water. At least low rainfall events and spring water is largely from groundwater derived under most conditions. In areas with unconfined shallow aquifers groundwater pumping near the rivers may result in the reverse water flow from the river towards the groundwater and result in decreased river flow. These maps provide preliminary information for more detailed groundwater and surface water studies.



AQUIFER TYPE	PROSPECTIVITY (Value of Terrain)	ROCK GROUPS	VULNERABILITY TO POLLUTION
POROUS (INTERGRANULAR)	HIGH	Quaternary aeolian deposits marginal to the coast consisting of fine to medium grain size sand.	High.
POROUS (INTERGRANULAR)	MODERATE-HIGH	Quaternary coastal plain deposits consisting of sand, clayey sand, clayey deposits and gravel underlying areas near the coast.	Moderate to high. Depends on permeability of the material that overlies the aquifer.
POROUS (INTERGRANULAR)	LOW-MODERATE	Quaternary alluvium (clay, sand and gravel with varying clay content) and lake/fluviatile deposits.	Low to high. Low where clay material overlies aquifer. High where there is no clay.
POROUS (INTERGRANULAR)	LOW-HIGH	Triassic sandstone, clay and gravel of non-marine origin (lacustrine alluvial deposits). Minor interconformable lenses (e.g. siltstone, shale). Variable thickness up to several hundred metres (e.g. siltstone, shale).	Low to high. Low where clay overlies aquifer. High where gravel aquifers come to the surface.
FRACTURED ROCK (intergranular on some horizons)	HIGH	Triassic, quartzite and lithic sandstones, mudstone, minor coal. Tertiary origin (R, Rv, Rv).	High unless a layer of low permeability material overlies the aquifer.
FRACTURED ROCK	MODERATE-HIGH	Permian mudstone, siltstone and sandstone (often pebbly), minor limestone, conglomerate and siltite. Many minor ironstone lenses.	Very high unless a layer of low permeability material overlies the aquifer.
FRACTURED ROCK	HIGH	Ordovician to Devonian turbidite sequence of sandstone and mudstone (Murray, Gagebrook). Ordovician limestone, Cambrian volcanics and sediments. Neoproterozoic mudstone, slate, quartzite and siltstone. Neoproterozoic sandstone.	High. Very occasionally deep clay soils may offer some protection and lower vulnerability.
FRACTURED ROCK	MODERATE	Tertiary basalt.	Moderate. Can be high if fractured zones are not overlain by low permeability material.
FRACTURED ROCK	LOW-MODERATE	Jurassic: siltstone. Devonian: siltstone. Permian: basalt. Tertiary basalt - Scottsdale, Ringarooma, Tamar and Brown Creeks.	Low to moderate. Can be high if highly fractured zones not covered by clay.
FRACTURED ROCK	LOW	Devonian granite rocks. Cambrian mafic ultramafic complexes (pentecostite, neopentecostite, diorite dykes). Precambrian granite.	Low to moderate. Can be high if highly fractured zones not covered by clay.

GROUNDWATER FEATURE
Feature type — Yield and accuracy — TDS

GROUNDWATER FEATURE TYPE AND ACCURACY

BOREHOLE YIELD
Litres/second Potential usage of groundwater based on borehole yield

SALINITY - TDS
Milligrams / litre

POTENTIOMETRIC CONTOURS

SALINITY CONTOURS
500 mg/L contour interval

GEOLOGY (TRIASIC / PERMIAN)

Scale: 1:100000
CGD66 - AMG Zone 55
Contour interval: 10 metres

MEAN ANNUAL RAINFALL
3300 mm
3000
2500
2000
1500
1000
500

GROUNDWATER QUALITY
Expressed as Total Dissolved Solids (TDS)
TDS in mg/L

Potential usage of groundwater based on water quality

These are general limits for the use of groundwater. The use of water for irrigation with the higher levels of salinity in the above table should only be considered on particularly suitable soil types with the adoption of specific management practices, or if the bore water is mixed with fresh water. For further information see Australian and New Zealand guidelines for fresh and marine water quality.

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MUNICIPAL PLANNING INFORMATION SERIES
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