

MAP 17 – HYDROGEOLOGICAL INVENTORY



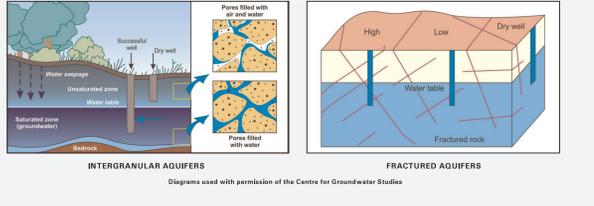
These maps are complementary to the 1:250 000 scale hydrogeological maps which use as a basis, a compiled 1:250 000 scale geology layer (derived from 1:250 000, 1:50 000, 1:63 360 scale geological maps together with some areas where only reconnaissance mapping is available). These 1:100 000 scale maps 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 priority areas of the State, these maps can be further developed and made more site specific.

Boreholes shown on the map are those with locations mostly supplied by drillers and from location in the field by MRT staff. There are many more boreholes installed for investigation and production purposes in coastal and inland areas of Tasmania that may not be shown on these maps at this stage. Boreholes with yields <0.05 L/s have been considered as successful bores. Outputs of bores are those supplied by drillers and are mostly the result of short term pumping measurements. Some bores 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 Permian rocks in most locations. The three dimensional shape effect enables users to understand the spatial relationship between adjoining groundwater 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 view of salinity from drill holes at a particular site. Natural groundwater quality is influenced by ground level 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 by 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 flow and the relationship between surface water, groundwater and rainfall is a particular area 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 groundwater surface water. At least low rainfall and spring water is largely from all 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 (Whole of Tasmania)	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, silty sand, silty loam and gravel underlying areas near the coast. Includes marine silt.	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 later boulder deposits. Minor windblown sands on rising bedrock.	Low to high. Low where clay material overlies aquifer. High where there is no clay.
POROUS (INTERGRANULAR)	LOW-HIGH	Tertiary sandstone, clay sand and gravel of non marine origin (locally alluvial deposits). Minor interconformable siltstone (e.g. variable thickness up to several hundred metres).	Low to high. Low where clay overlies aquifers. High where gravel aquifers come to the surface.
FRRACTURED ROCK (intergranular on some horizons)	HIGH	Permian, quartzite and lithic sandstones, mudstone, minor coal. Tertiary origin (R, Rv, Rv).	High - unless a layer of low permeability material overlies the aquifer.
FRRACTURED ROCK	MODERATE-HIGH	Permian mudstone, siltstone and sandstone (often pebbly), minor limestone, conglomerate and siltite. Many main origin (P).	Very high - unless a layer of low permeability material overlies the aquifer.
FRRACTURED ROCK	HIGH	Tertiary basalt.	High - very occasionally deep clay soils may offer some protection and lower vulnerability.
FRRACTURED ROCK	MODERATE	Jurassic - Silurian. Devonian - Permian.	Moderate. Can be high if fractured zones are not overlain by low permeability material.
FRRACTURED ROCK	LOW-MODERATE	Devonian granitic rocks. Cambrian mafic ultramafic complexes (pentrite, serpentinite, diorite etc.). Precambrian granite.	Low to moderate. Can be high if highly fractured zones not covered by clay.

GROUNDWATER FEATURE
Feature type: Yield and accuracy. Salinity-TDS.

GROUNDWATER FEATURE TYPE AND ACCURACY

- Borehole location accuracy: 1-500 metres, 500-2000 metres, 2000-5000 metres, 5000-20000 metres, Well, dug well location accuracy 500-2000 metres.
- Spring point location accuracy: 1-500 metres, 500-2000 metres, Well, dug well location accuracy 500-2000 metres.

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

- Unknown
- < 0.05 Domestic, stock, garden, limited irrigation
- 0.05 - 0.5 Domestic, stock, garden, moderate area irrigation, small communities
- 0.5 - 1.5 Domestic, stock, garden, small area irrigation, small communities
- 1.5 - 5.0 Domestic, stock, garden, moderate area irrigation, small communities
- 5.0 - 10.0 Domestic, stock, garden, large area irrigation, small towns, supplement to larger towns
- > 10.0 Domestic, stock, garden, large area irrigation, small towns, supplement to larger towns

SALINITY - TDS
Milligrams / Litre

- Unknown
- < 300
- 300 - 1000
- 1000 - 1500
- 1500 - 3000
- 3000 - 7000
- > 7000

POTENTIOMETRIC CONTOURS

- Potentiometric contours of deeper Tertiary Aquifers (5m contour interval)
- Potentiometric surface contours (10m contour interval)
- Potentiometric surface contours in Tertiary basalt (10m contour interval)
- Tertiary age deep lead - position approximate Great Forester River Catchment (NE Tasmania)

SALINITY CONTOURS

- Salinity contours of deeper Tertiary Aquifers (500 mg/L contour interval)
- Longford Area (Geological Bulletin 59)

MEAN ANNUAL RAINFALL

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

- < 500 All purposes, domestic and irrigation
- 500 - 1000 Most purposes, general upper limit for irrigation
- 1000 - 1500 Most purposes, upper limit for drinking, limited irrigation
- 1500 - 3000 All livestock, very limited irrigation
- 3000 - 7000 Most livestock (not pigs or horses)
- > 7000 Limited stock use (beef cattle, sheep)

Scale: 1:100000
AGD86 - AMG Zone 55
Contour Interval: 100 metres

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MUNICIPAL PLANNING INFORMATION SERIES MAP 17