

# MAP 8 – 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.

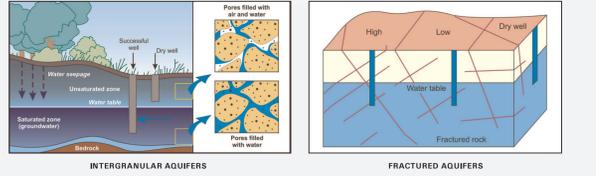
Boreholes shown on the map are those with locations mainly supplied by drillers and from location in the field by MRT staff. There are many open boreholes installed for investigation and production purposes in coastal sand deposits in Tasmania that may not be shown on these maps at this stage. Boreholes with yields <0.03 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 siltstone, mudstone and coal measures has lower prospectivity and poorer quality groundwater than the Lower Triassic and Permian rocks in most locations. The three dimensional shaded relief enables users to understand the spatial relationship between adjoining groundwater units shown on the map and in some cases their relative thicknesses.

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 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 weathering, fracturing, porosity and the relationship between surface water, groundwater and rainfall) is a particular area are important considerations in resource and other groundwater related studies. The attached average rainfall map can be used to make general deductions about the possible links between the above-mentioned water balance factors. Climate has an effect on quantity and quality of low groundwater and surface water. At least low in rivers and spring water is largely. First 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 (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, silty sand, silt, silty clays 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 later boulder deposits.  | Low to high. Low where clay material overlies aquifer. High where there is no clay.            |
| POROUS (INTERGRANULAR)                          | LOW - HIGH                       | Tertiary sedimentary clay sand and gravel of non marine origin (lacustrine alluvial deposits). Minor interstratified Permian mudstone, siltstone and sandstone (often pebbly), minor limestone, conglomerate and tillite. Many main range (P). | Low to high. Low where clay overlies aquifers. High where gravel aquifers come to the surface. |
| FRACTURED ROCK (transgranular or 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 tillite. Many main range (P).  | Very high - unless a layer of low permeability material overlies the aquifer.                  |
| FRACTURED ROCK                                  | HIGH                             | Tertiary basalt.   | High - very occasionally deep clay soils may offer some protection and lower vulnerability.    |
| FRACTURED ROCK                                  | MODERATE                         | Jurassic - Silurian Devonian turbidite sequence of sandstone and mudstone (Muller's Supergroup); Ordovician limestone, Cambrian volcanics and sediments. Precambrian mudstone, slate, quartzite and dolomite. Neoproterozoic sandstone.        | Moderate. Can be high if fractured zones are not overlain by low permeability material.        |
| FRACTURED ROCK                                  | LOW - MODERATE                   | Devonian granitic rocks. Cambrian mafic ultramafic complexes (pentrite, serpentinite, olivine gneiss). Precambrian granite.  | Low to moderate. Can be high if highly fractured zones not covered by clay.                    |

**GROUNDWATER FEATURE**  
Feature type: Yield (litres per second) and accuracy: Yields - TDS

**GROUNDWATER FEATURE TYPE AND ACCURACY**

- Borehole location accuracy: 1-500 metres, 500-2000 metres, 1-500 metres, 500-2000 metres, Well, dug well location accuracy 500-2000 metres.
- Spot 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 (Dry)
- < 0.05: Limited use for domestic and stock
- 0.05 - 0.5: Domestic, stock, garden
- 0.5 - 1.5: Domestic, stock, garden, limited irrigation
- 1.5 - 5.0: Domestic, stock, garden, moderate area irrigation
- 5.0 - 10.0: Domestic, stock, garden, moderate area irrigation, small townships
- > 10.0: Domestic, stock, garden, large area irrigation, small townships, supplement to larger towns

**SALINITY - TDS**  
Milligrams / litre

- Unknown
- < 500
- 500 - 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)
- Great Forester River Catchment (NE Tasmania)
- Potentiometric surface contours in Tertiary basalt (10m contour interval)
- Tertiary age deep lead - position approximate Great Forester River Catchment (NE Tasmania)

**SALINITY CONTOURS**  
500 mg/L contour interval  
Longford Area (Geological Bulletin 59)

**GEOLOGY (TRIASIC / PERMIAN)**

- Undifferentiated Triassic sediments (P)
- Upper Triassic sediments - stratified mudstone and sandstone, siltstone and clay
- Lower Triassic sediments - unstratified sandstone
- Permian sandstone (P)

**Scale: 1:100000**  
AGD96 - AMG Zone 55  
Contour Interval: 100 metres

**MEAN ANNUAL RAINFALL**  
3300 mm, 3000, 2500, 2000, 1500, 1000, 500

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

- < 500: All purposes, domestic and irrigation
- 500 - 1000: Most purposes, upper limit for drinking, limited 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)

**MEAN ANNUAL RAINFALL**  
The rainfall map shows the mean annual rainfall over Tasmania for the standard 30-year period from 1981 to 2010. It was derived from a combination of the Tasmanian Hydrological Office of the Bureau of Meteorology, from gauged or un-gauged rain gauges in the Tasmanian National Climate Centre. The rainfall map is available on the Bureau of Meteorology website. The rainfall map is available on the Bureau of Meteorology website.

**INDEX TO ADJOINING MAP SHEETS**

**WARNING: INKS ARE LIGHT SENSITIVE**

coverprojctas, prospectivity/amlm/1003d.dmi  
Profile for this map generated from digital data: September 19, 2006