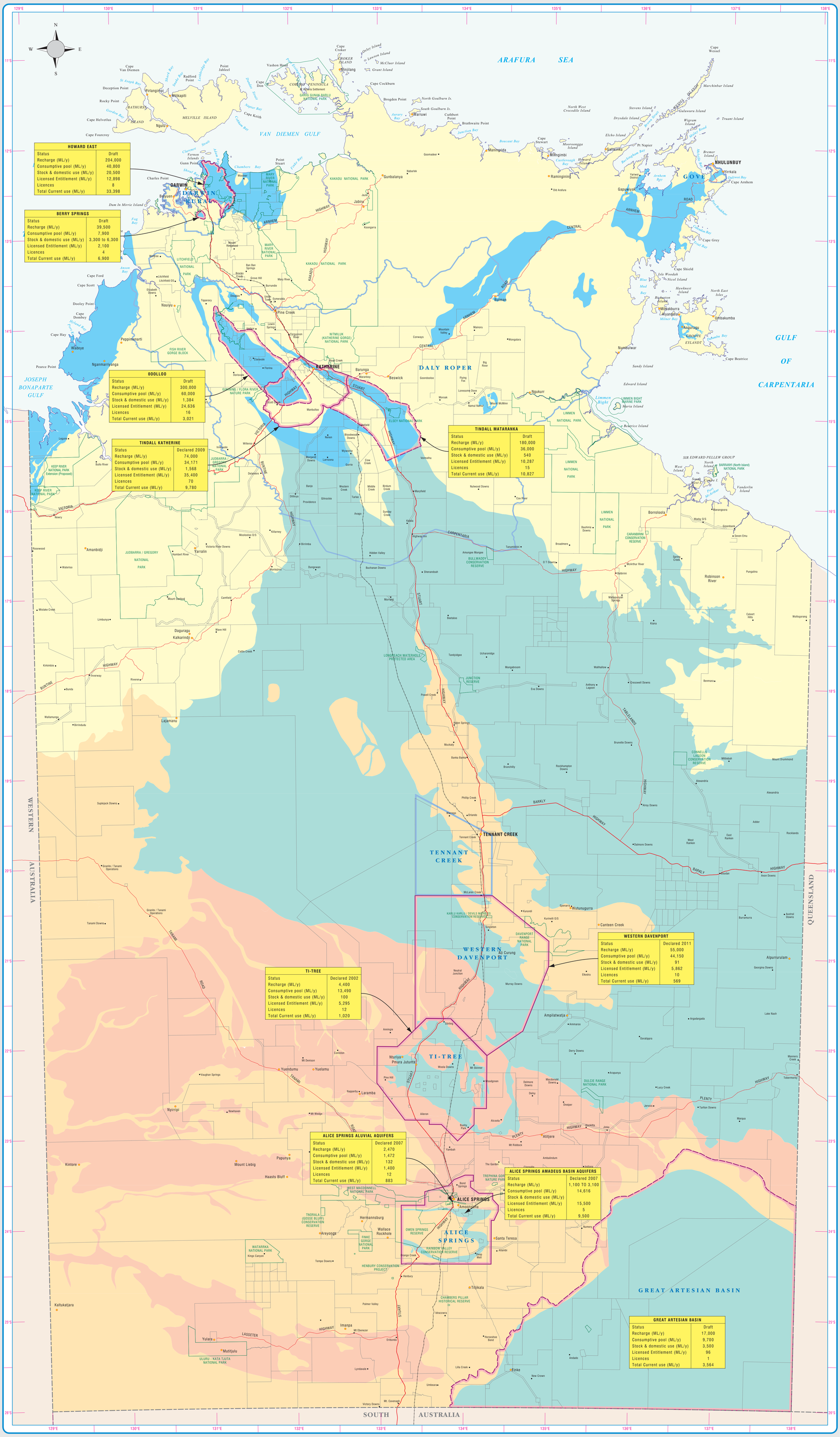
# NORTHERN TERRITORY GROUNDWATER PROSPECTS




## GROUNDWATER PROSPECTS

- Moderate to high yields, moderate regular recharge, local water quality limitations in coastal areas
- Moderate to high yields, low intermittent recharge, local water quality limitations
- Low to moderate yields, moderate to low regular recharge, local water quality limitations in coastal areas
- Low to moderate yields, low intermittent recharge, local water quality limitations
- Low yields, low intermittent recharge, water quality limitations

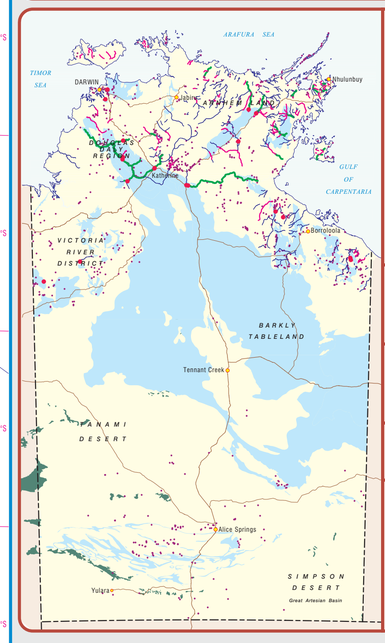
## WATER ALLOCATION PLANNING

- Declared Water Allocation Planning Area
- Draft Water Allocation Planning Area

### Water Statistics Definitions

| | |
|---|---|
| Status | Water allocation plan either declared or draft |
| Recharge (ML/y) | The average amount of water added each year to an aquifer by natural process |
| Consumptive pool (ML/y) | The total amount of water available for consumptive use |
| Stock & domestic use (ML/y) | Water used for stock and domestic purposes (unlicensed) |
| Licensed Entitlement (ML/y) | Maximum licensed extraction |
| Licences | The number of groundwater extraction licences issued |
| Total Current use (ML/y) | The actual amount of water used |

## GROUNDWATER DISCHARGE




### DISCHARGE

Groundwater usually discharges at low-lying points in the landscape. It can take the form of individual springs or as diffuse seepage into stream beds. Recharge to groundwater is greatest in the higher rainfall zone in the north, so discharge is correspondingly greater.

Many streams in the north maintain a flow for at least part of the long dry season because of groundwater discharge. Some streams, particularly those with major karstic or porous rock aquifers in their catchments, flow throughout the dry season. Springs with significant discharges (more than 100 L/s) only occur in karstic aquifers.

Another mechanism for groundwater discharge is where trees in the riparian zone directly tap the watertable. This occurs throughout the Territory, but in the arid south it is thought to be the dominant process along with discharge through salt lakes.

This map shows recorded springs and streams that flow throughout the dry season. The streams have been classified according to their flows at the end of the dry season. The classification only extends to the tidal limit, so some streams such as the Roper River appear to stop before reaching the coast.

### SPRINGS

- Springs
- Major Springs
- Salt Lake

### END OF DRY SEASON FLOWS

- Greater than 100 Litres/second
- 10 to 100 Litres/second
- Up to 10 Litres/second

### AQUIFER

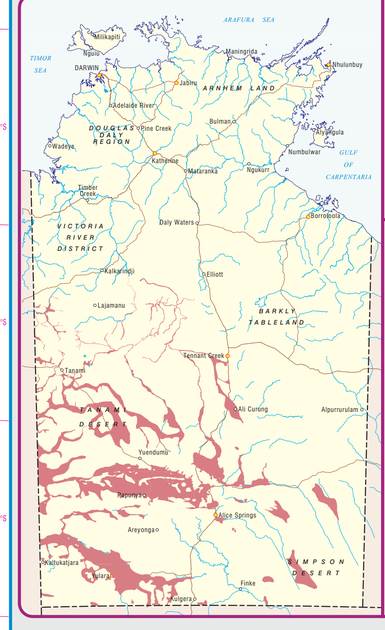
- Karstic Aquifers

Source:

Hydstra Database and existing hydrogeological maps.
Northern Territory Department of Land Resource Management.

km 0 250 500 km

## PALAEOVALLEYS




A relict drainage system that formed in the Tertiary era between 2 and 65 million years ago is preserved in the south western part of the Territory. It comprises small sedimentary basins and narrow palaeovalleys.

Aquifers are developed in river sands and gravels that form part of the channel and basin fills. Shallow calcrete layers can host fractured and karstic aquifers.

Apart from the Ti-Tree Basin and some palaeovalleys in the Tanami desert, few of these deposits have been investigated for their groundwater potential.

This map has been compiled from geological maps, satellite imagery and water bore data. In many places it is highly speculative due to the sparse drilling in those areas.

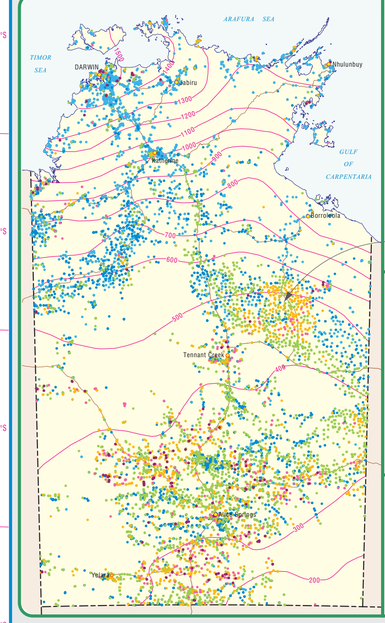
- Palaeovalleys and Sedimentary Basins

Source:

Paleovalley Groundwater Project,
Northern Territory Department of Land Resource Management and Geoscience Australia, Australian Government.

km 0 250 500 km

## SALINITY and RAINFALL




### GROUNDWATER SALINITY

All groundwaters contain dissolved salts, derived either from weathering of the host rock, from the minute amounts contained in rainfall or from evaporite deposits. The latter are salt deposits formed at the same time as the surrounding sedimentary rocks.

The map depicts groundwater salinities measured from individual water bores.

It shows generally low salinities in the north. In those areas, high rainfall, higher recharge rates and a faster through-flow of groundwater leads to less opportunity for salts to concentrate by evaporation in the soil before they are flushed down to the aquifer.

The reverse is true in the arid zone to the south where salinities are highly variable and range up to values almost twice the concentration of seawater (34,000 mg/L TDS). Low salinities observed in the arid zone reflect localised areas of enhanced recharge such as along rivers and floodouts.

A prominent area of saline groundwaters to the north east of Tennant Creek reflects extensive evaporites within the Georgina Basin. Both gypsum (calcium sulphate) and halite (sodium chloride) occur in the rocks of that area.

### TOTAL DISSOLVED SOLIDS (TDS)

| | | Human Consumption | Domestic | Irrigation | Stock |
|---|---|---|---|---|---|
| 0 - 500 mg/L | Fresh | | | | |
| 500 - 1000 mg/L | Fresh | | | | |
| 1000 - 3000 mg/L | Brackish | | | | |
| 3000 - 7000 mg/L | Saline | | | | |
| 7000 - 14000 mg/L | Saline | | | | |
| 14000 - 59000 mg/L | Saline, unsuitable for most purposes | | | | |

- Annual Rainfall (mm)

Source:

Hydstra Database.
Northern Territory Department of Land Resource Management.

Median Annual Rainfall, 2003. Bureau of Meterology. Australian Government.

km 0 250 500 km

## YIELD


### BORE YIELD

The map shows the most likely range of bore yields that can be expected for a particular area. Note that higher or lower yields can be encountered depending on local conditions.

The higher yields (more than 5.0 Litres/second) occur in fractured and karstic aquifers.

Most fractured rock aquifers give intermediate yields (0.5 - 5.0 Litres/second), while low yielding aquifers include granite and shale.

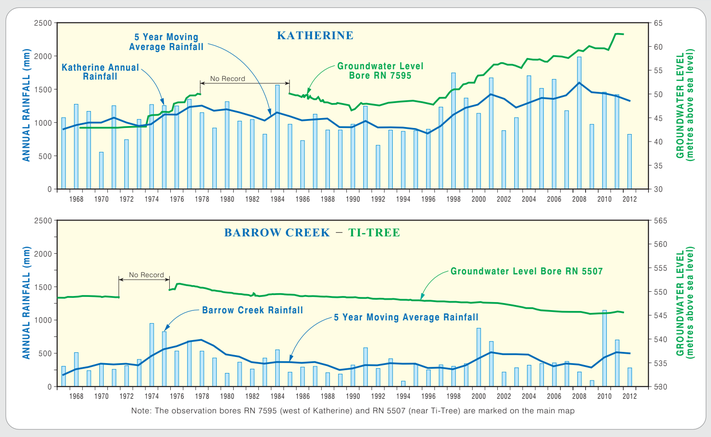
- 5.0 - 50.0 Litres/second
- 5.0 - 10.0 Litres/second
- 0.5 - 5.0 Litres/second
- 0.5 - 2.5 Litres/second
- 0.05 - 0.5 Litres/second

Source:

Hydstra Database.
Northern Territory Department of Land Resource Management.

1 : 2 500 000 scale digital geology, Geological Survey,
Northern Territory Department of Mines and Energy.

km 0 250 500 km




Note: The observation bores RN 7595 (west of Katherine) and RN 5507 (near Ti-Tree) are marked on the main map

kilometres 50 0 50 100 150 200 kilometres

Lamberts Conformal Conic Projection
Standard Parallels, (1st) 12°40' South and (2nd) 23°20' South Central Meridian 133° 30' East
Geocentric Datum of Australia 1994 (GDA94)

GDA This map was produced on the Geocentric Datum of Australia 1994 (GDA 94)


Warning: Colours will fade with prolonged exposure to light

Map Reference: DLRM2013005

Produced by the
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Palmerston, Northern Territory, Australia.

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Hydrogeology: S J Tickell, July 2013
Water Resources Division, DLRM

Cartography: L J Fritz, Spatial Data & Mapping,
Water Resources Division, DLRM

For further Information and map availability, contact:

**Water Resources Division**
**Department of Land Resource Management (DLRM)**
4th floor Goyder Centre, 25 Chung Wah Terrace, Palmerston.
**T:** (08) 8999 4455 **Email:** waterresources@nt.gov.au
P.O. Box 496, Palmerston, 0831. Northern Territory, Australia.
**Internet:** www.lrm.nt.gov.au/nrmapsnt
Map Reference: Groundwater of the Northern Territory

The recommended reference for this map is:
Tickell SJ, 2013. *Groundwater of the Northern Territory, 1:2 000 000 scale.*
Department of Land Resource Management, Northern Territory.

## LEGEND

| | |
|---|---|
| DARWIN | Main Population Centre |
| Barunga | Major Population Centre |
| Jilkminggan | Minor Population Centre |
| Ti-Tree | Locality |
| Florina | Pastoral property |
| | Property boundary |
| GOVE | Water Control District |
| | Water Control District and Water allocation Plan |
| TI-TREE | Water Allocation Plan |
| OWEN SPRINGS RESERVE | National Park, Reserve or managed for conservation |
| | State / Territory border |
| | Road - National Highway |
| | Road - State Arterial |
| | Road - Secondary |
| | Railway |
| | Gas pipeline |
| | Gas Field, Oil & Gas Field |
| | Mine - Open Pit, Underground |
| RN 5507 | Observation Bore / Number |
| | Watercourse, Major Spring |

Northern Territory Government