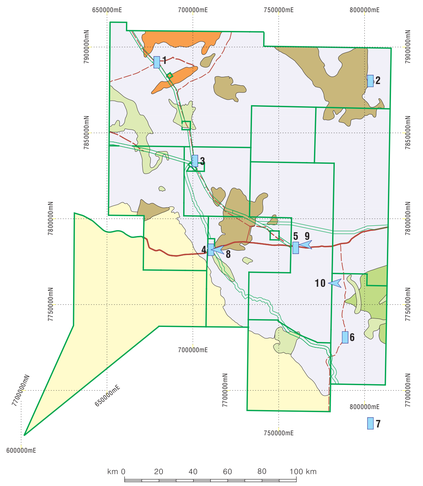
SURFACE WATER RESOURCES

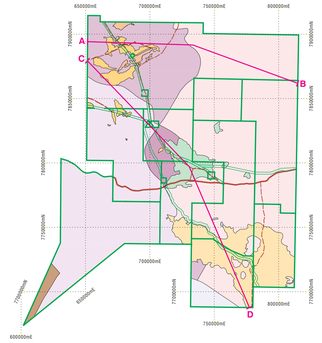


Rain gauge
1 Alexandria Homestead
2 Gallipoli Homestead
3 Ranken River Store
4 Soudan Homestead
5 Avon Downs Homestead
6 Austral Downs Homestead
7 Lake Nash Homestead

River gauge
8 Ranken River
9 James River
10 Shakespeare Creek

DESCRIPTION
"Semi-desert country". Slopes gently to the SE; relief 100m. Residual red sand and patches of pisolitic ironstone ("buckshot") gravel on low rises; minor sandridges trending NW. Minor bluebush swamp and claypans. (In isolated areas ground may be cavernous under the sand cover). Drainage ill-defined, short and internal. Ephemeral runoff. Unsuitable for surface water storage development
Swamp, claypans or densely braided creeks. Dark grey silty clay. Lowland, subject to flood inundation. Generally unsuitable for surface storage development (chiefly because of intermittent, widespread sheet flooding and siltation).
As above, alluvial silt and sand.
Scrub woodland on low "plateau-like" rises. Relief of maximum 5m above surrounding plain. Rubbly, pebbly red/mauve pisolitic ironstone (lateritised calcarenites) and chert "gibber". Scattered dolomite outcrops. (In isolated areas ground may be cavernous under the gravel cover). Generally unsuitable for surface storage development (because of unsuitable soils, lack of depth of soil and low runoff potential).
Grassed, gently undulating "Black soil plain" & "downland". Little relief; max. 50m. Brown-grey, very fine sandy clayey silt soil; cracks, slakes & swells. Isolated patches of low sandy/gravelly rises of red clayey silt soil. Dendritic, trellis & braided drainage; frequently incised. Natural ephemeral to semi-permanent waterholes. Surface water is milky; contains suspended clay particles. Runoff moderate to high. Suitable for surface storage development. (Careful site selection required).
Low sandstone ridges up to 10m above surrounding plain. Surface runoff comparatively high. Generally unsuitable for surface storage development except where the foothill slope meets the plain (where there is adequate storage area and soil depth).

SIMPLIFIED GEOLOGY

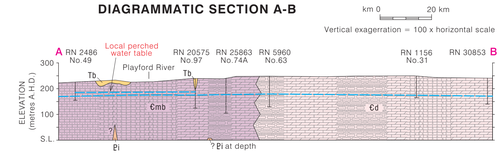


LEGEND

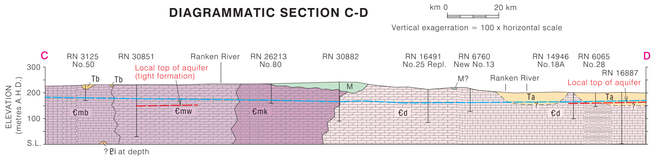
- Cavernous Limestone
- Limestone and Sandstone Interbeds
- Limestone and Chert
- Limestone and Dolomite
- Geological Boundary
- Watertable
- A — B Line of cross-section
- Bore along (or very close to) line of cross-section

		DESCRIPTION
	Ta	Tertiary Limestone, Siliceous Limestone, some Dolomite, Chert nodules, sandy lenses. ("The Austral Downs Limestone").
	Tb	Tertiary Limestone, Siliceous Limestone, some Dolomite, Chert nodules, sandy lenses. ("The Brunette Limestone").
	M	Cretaceous Sandstone, pebbly Conglomerate.
	€um	Late Cambrian Dolomite, Sandstone. ("The Meeta Beds").
	€mw	(Early to Middle?) Cambrian Silicified Limestone, Mudstone, Sandstone, Chert. Silicified Dolomite, Shale. ("The Wonarah Beds").
	€mb	(Early?) Cambrian Chert, Calcareous Sandstone, Fossiliferous and Crystalline Limestone and minor Siltstone ("The Burton Beds").
	€mk	(Middle?) Cambrian Fossiliferous and Crystalline Limestone, Silicified Limestone. Some chert nodules. ("The Ranken Limestone").
	€d	Cambrian Crystalline Dolomite, Chert nodules and bands, Dolomitic Limestone. Minor Sandstone. ("The Camooweal Dolomite").
	Pi	Upper Proterozoic Sandstone. ("The Mittiebah Sandstone").
	Ph	Lower Proterozoic Sandstone.

DIAGRAMMATIC SECTION A-B



DIAGRAMMATIC SECTION C-D



GROUNDWATER RESOURCES

LEGEND

- No aquifers
- Water table less than 60 metres below ground level

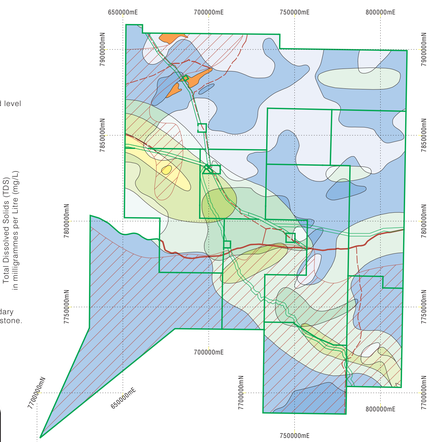
Yield
Litres per second (L/s)
"low yield" "high yield"
< 2.5 | 2.5-5.0 | > 5.0

Total Dissolved Solids (TDS) in milligrammes per Litre (mg/L)

- Fresh water. TDS < 1000 mg/L
- Fair water. TDS 1000 - 1500 mg/L
- Brackish water. TDS 1500 - 3000 mg/L
- Saline water. TDS > 3000 mg/L

All Aquifers are widespread and consist of fractured, porous (secondary porosity), locally weathered Limestone, Dolomite and Siliceous Limestone.

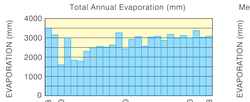
km 0 20 40 60 80 100 km



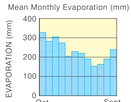
EVAPORATION

Brunette Downs Homestead

Total Annual Evaporation (mm)



Mean Monthly Evaporation (mm)



WATER YEAR (October 1 - September 30)

RAINFALL

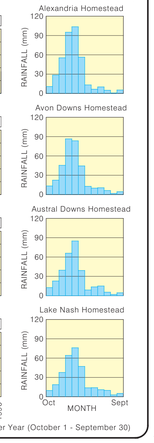
Total Annual Rainfall (mm)

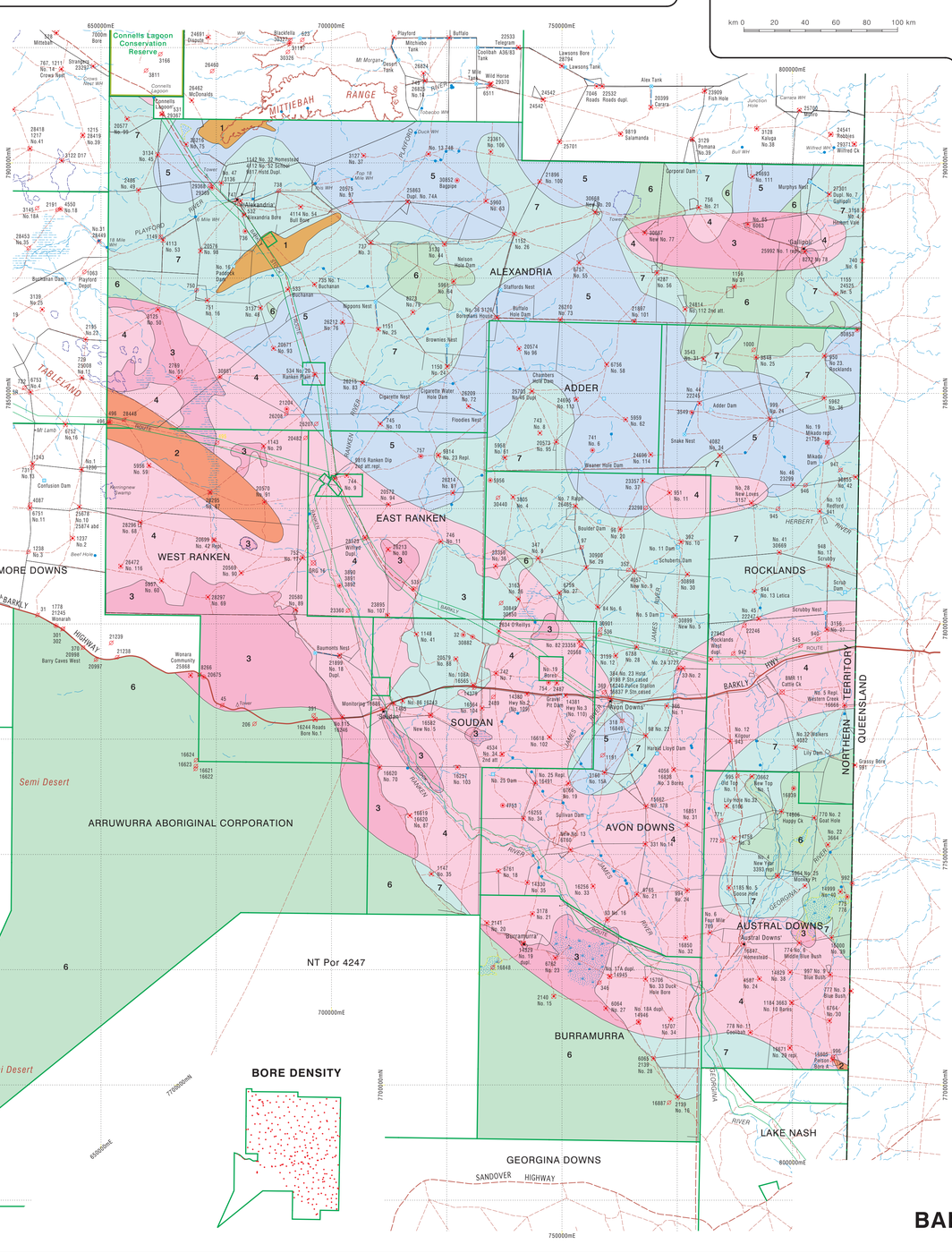
LEGEND
- dry
- average
- wet
- Alexandria rainfall
- Gallipoli rainfall
- Ranken River (Store) rainfall
- Avon Downs rainfall
- Soudan rainfall
- Austral Downs rainfall
- Lake Nash rainfall

Note: Gaps indicate no record not nil rainfall

RAINFALL

Mean Monthly Rainfall (mm)





BORE DENSITY

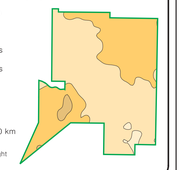
MAP LOCALITY

PHYSIOGRAPHY

Elevation - metres AHD
- < 200 metres
- 200 - 250 metres
- 250 - 300 metres
- > 300 metres
- Watercourse

km 0 100 km

This map displays the height of the ground surface



INDEX TO 1 : 250 000 MAP SHEETS

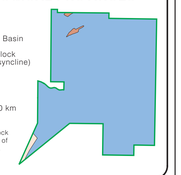
BRUNETTE DOWNS SE 53-11	MOUNT DRUMMOND SE 53-12
ALROY SE 53-15	RANKEN SE 53-16
FREW RIVER SF 53-03	AVON DOWNS SF 53-04
ELKEDRA SF 53-07	SANDOVER RIVER SF 53-08

GEOLOGICAL PROVINCES

- Georgina Basin
- South Nicholson Basin
- Tennant Creek Block (Davenport Geosyncline)

km 0 100 km

This map displays major rock provinces grouped by age of formation and rock type.



WATER RESOURCES DEVELOPMENT OPTIONS

	DEVELOPMENT OPTION	DESCRIPTION
1	Unsuitable for development	Hill country
2	Specified Stock only e.g. unsuitable for young stock	Low - high yield, saline groundwater
3	Stock only	Low - high yield, fair - brackish groundwater (local sites suitable for dam construction)
4	Stock only	Surface water and low - high yield, fair - brackish groundwater
5	Domestic, stock	Surface water and low yield, fresh groundwater (local areas unsuitable for dam construction)
6	Domestic, irrigation, stock	High yield, fresh groundwater
7	Domestic, irrigation, stock	Surface Water and high yield, fresh groundwater.

NOTES:
1 Development options: "domestic, irrigation" indicate these waters could be developed for such uses.
2 This map pertains to water attributes only; not all soils are suitable for irrigation over the areas designated; refer to 'Sodium Hazard Map' in conjunction with this map.

GDA

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

kilometres 0 5 10 15 20 25 50 75 kilometres

Transverse Mercator Projection
Black Numbered Lines are 50 000 meter Intervals of the Map Grid of Australia, Zone 53
Horizontal Datum : GDA 94 Vertical Datum : Australian Height Datum

LEGEND

- Development boundary
- 2 Development option number
- Equipped bore
- Cased bore
- Abandoned bore
- Exploration bore
- 27843 Registered number of bore/well
- No. 2 Goat Hole Name of bore/well
- Turkey nest dam
- Mikado Dam Earth embankment dam
- Name of dam or turkey nest
- Pipeline
- Ephemeral watercourse
- Waterhole
- Major road - sealed
- Major road - unsealed
- Minor road - sealed
- Minor road - unsealed
- Track
- Building/s
- Fence
- Pastoral boundary
- State boundary

Map compiled by Hydrogeologist, Eric Rooke.
It forms part of the National Landcare Project: Water Resources Assessment of the Barkly/Gulf Region.

The data was overlaid on geological maps supplied in digital form, by the Australian Geological Survey Organisation, Canberra, ACT.

AUSLIG TOPO-250K data supplied through the Land Information Division, Department of Lands, Planning and Environment.

Project co-ordination by Peter Jolly, Director, Groundwater.

Cartography by Avis Wiegele, Geographic Information System Unit, using Intergraph graphic applications.

Bore and dam field data collected by Technical Officer Ron Darby.

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NATIONAL LANDCARE PROGRAM

BARKLY LANDCARE CONSERVATION ASSOCIATION

WATER RESOURCES
Department of Lands, Planning and Environment

WATER RESOURCES MAP OF
BARKLY / GULF STUDY REGION 1