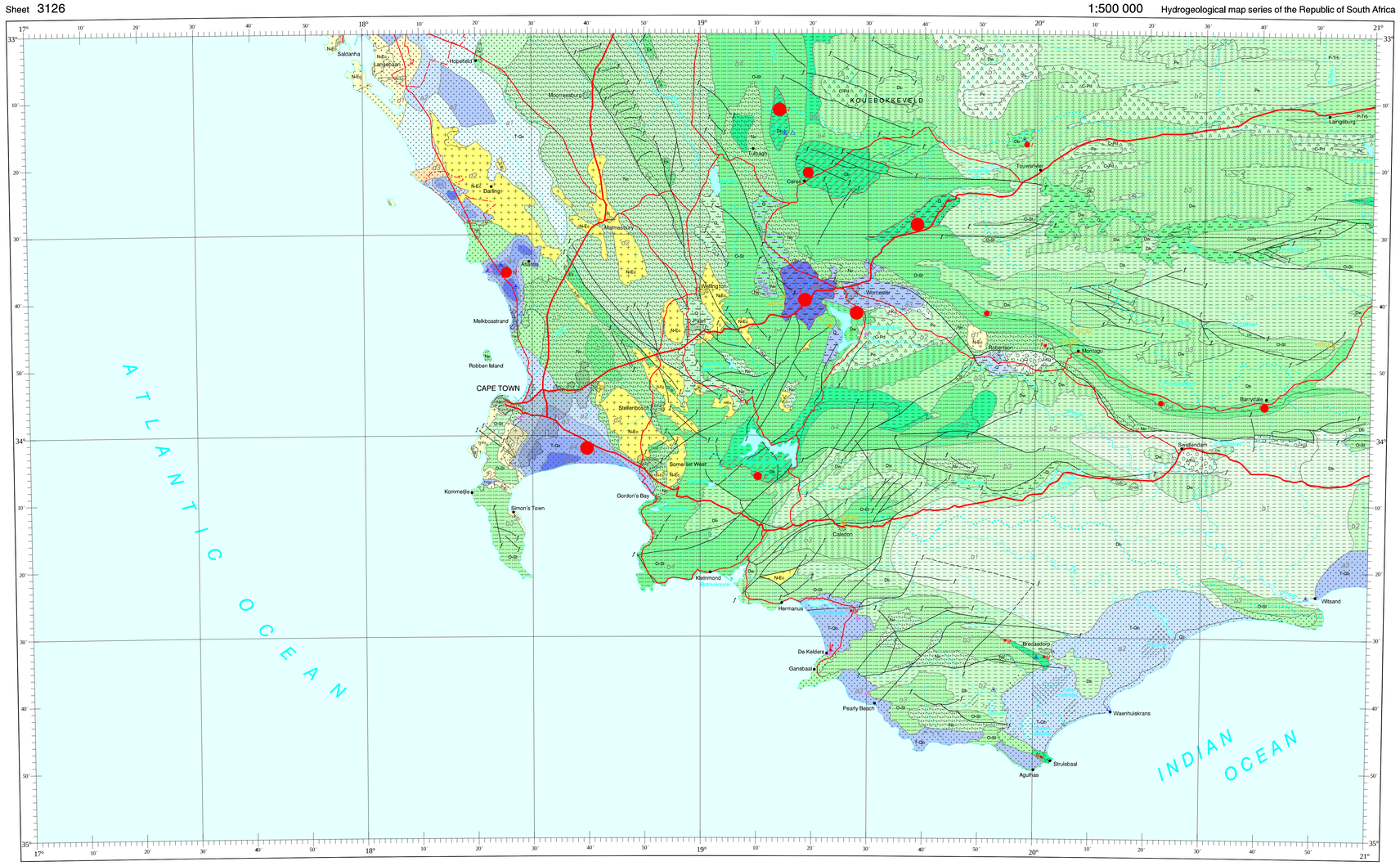
Sheet 3126

1:500 000 Hydrogeological map series of the Republic of South Africa



DRAFT PLOT:
For general review
VOORLOPIGE UITGAWE:
Vir algemene hersiening
Date : 10 Jan 00

CAPE TOWN

1999

10 0 10 20 30 40 50 60 km

Lambert's conformal conic projection, Standard parallels 29 ° 42' & 33° 00', Central Meridian 19 °, Spheroid Clarke 1880.

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This map was approved by the Director-General of the Department of Water Affairs and Forestry.

The groundwater occurrence and groundwater quality maps, and the schematic cross-sections were compiled by P.S. Meyer. The lithology was adapted by P.S. Meyer from the 1:1 000 000 scale published Geological map (1984). Permission from the Council for Geoscience to make use of their information is gratefully acknowledged. E. Louw was responsible for the compilation of the borehole distribution map. Borehole data were obtained from the National Groundwater Data Base (NGDB). Precipitation and elevation data were obtained from the Computing Centre for Water Research, University of Natal, and compiled by H. Mullin. Information on roads, rivers, towns and the coastline were obtained from the Chief Directorate: Surveys and Mapping, Department of Land Affairs and edited by Department of Water Affairs and Forestry.

Principal groundwater occurrence

Aquifer type	Borehole yield class (median l/s) (excluding dry boreholes) 0,0 - 0,1	0,1 - 0,5	0,5 - 2,0	2,0 - 5,0	> 5,0
Intergranular	a1	a2	a3	a4	a5
Fractured	b1	b2	b3	b4	b5
Karst	*	*	*	*	*
Intergranular and fractured	d1	d2	d3	*	*
Two-layered	a3/b4	Upper aquifer: Intergranular: 0,5 - 2,0 l/s Lower aquifer: Fractured: 2,0 - 5,0l/s			

Borehole yields boundary

Note: Groundwater occurrence depicts the aquifer type(s) with the highest borehole yield, and does not always correlate with surface lithology. The two-layered case, however, always represents the upper two aquifers.

Surface lithology

- Alluvium (clay, sand, gravel and boulders)
- Undifferentiated coastal deposits (unconsolidated to semi-consolidated sediments including sand, calcrete, calcarenite, aeolianite, marine gravel, clay, silcrete and limestone)
- Predominantly argillaceous rocks (shale, claystone, mudstone and siltstone)
- Predominantly arenaceous rocks (sandstone, feldspathic sandstone, arkose and sandstone becoming quartzitic in places)
- Argillaceous and arenaceous rocks (approximately equal proportions)
- Predominantly rudaceous rocks (conglomerate)
- Predominantly diamictite (tillite)
- Intrusive granite
- Undifferentiated metamorphic rocks (mixed lithologies)
- Lithological / stratigraphical boundary
- Fault
- Inferred fault
- Intruded by diabase

Large scale groundwater abstraction

- > 10 million m³/a
- 5 - 10 million m³/a
- 2 - 5 million m³/a
- 1 - 2 million m³/a
- 0,1 - 1 million m³/a

I Irrigation
M Municipal

Area of large scale groundwater abstraction

Irrigation

- Spring (>5 l/s)
- Thermal spring (°C)
- Groundwater level recorder
- Groundwater level monitoring point
- Primary drainage region boundary
- Primary / perennial river
- Secondary / perennial river
- Non-perennial river
- Subterranean Government Water Control Area
- Dam
- Vlei
- City / town area
- Town
- National road
- Main road: Inset maps: National road
- Inset map: Main road
- Not applicable to this map

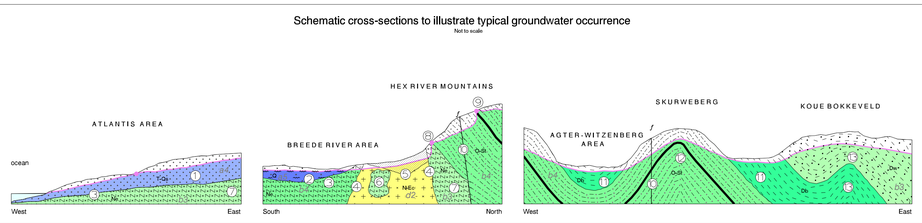
Chronostratigraphy

1	2	3	4	5	6
1,8	CENOZOIC		Quaternary	Q	Alluvium (Q); Unnamed Coastal Sands (Qz)
					Bredasdorp G. (T-Qb); Sandveld G. (T-Qs)
65			Tertiary	T	
142	MESOZOIC		Cretaceous	K	Uitenhage G. (J-Ku)
205			Jurassic	J	
248			Triassic	Tr	Beaufort G. (P-Tr6)
290			Permian	P	Ecca G. (Pe)
354	PHANEROZOIC		Carboniferous	C	Dwyka G. (C-Pd)
417		PALAEOZOIC	Devonian	D	Bokkeveld G. (Db); Witteberg G. (Dw)
443			Silurian	S	Table Mountain G. (O-St)
495			Ordovician	O	
545			Cambrian	Є	Klipheuwel G. (Є k) Note: Є k* will be shown on the map as "Ek" Cape Granite S. (N- Є c) Note: N- Є c* will be shown on the map as "N-Ec"
900	PROTEROZOIC	Namiblan		N	Malmesbury G. (Nm)
		Mokolian		M	
2050		Vaalian		V	
2650		Randian		R	
3100	ARCHAEOZOIC	Swazian		Z	

1 = 1 Million years before present (Council for Geoscience, 1997)
2 = Erathem (Era)
3 = Erathem (Era)
4 = System (Period)
5 = Symbol
6 = Complex (C), Suite (S), Group (G), Formation (F) (with symbol)

Schematic cross-sections to illustrate typical groundwater occurrence

Not to scale



1. Large quantities of good quality groundwater are stored in Cenozic sediments of the Sandveld Group on the coastal plain between Cape Town and Saldanha
2. Alluvium in some of the river valleys can yield large quantities of groundwater of good quality
3. Water saturated alluvium / coastal deposits often act as recharge media to underlying jointed rocks
4. Groundwater can be developed on intrusive contact zones between granite and Malmesbury Group rocks
5. Weathered zones and occasional fracturing in the granite can be targeted for groundwater development
6. Groundwater can occasionally be exploited from Malmesbury Group rock inclusions in granite
7. Joints and fractures, interbedded grits and sandstones, and bedding-planes in the Malmesbury Group rocks can be targeted for groundwater development
8. Springs, often poor yielding, issue in places on the uncomformitly between rocks of the Malmesbury Group and Table Mountain Group (TMG)
9. Numerous springs issue from the TMG, due to the presence of interbedded shale layers such as the Cedarberg Shale Formation. The latter formation often divides the TMG into different groundwater compartments
10. The competent quartzitic sandstones of the TMG in particular, but also arenaceous lithozones in the Bokkeveld, Witteberg and Ecca Groups, contain numerous fractures and joints, associated with major faulting, all of which can be targeted for groundwater development
11. Where Bokkeveld Group rocks are relatively sandstone-rich, good groundwater potential can be expected, provided ground-water recharge conditions are favourable. Overlaying Alluvium often aids groundwater recharge to underlying jointed Bokkeveld Group rocks, as is the case in the Hexriver Valley north of Worcester
12. Numerous joints and fractures on crests of anticlines in especially TMG-rocks can be targeted for groundwater development
13. Groundwater occurs in numerous smaller fractures, originating from folding in the Bokkeveld, Witteberg, Dwyka, Ecca and Beaufort Groups

Weathered zone
Groundwater level
Cedarberg Shale Formation

Note:
For additional information concerning groundwater ocurrence refer to accompanying brochure.

The general hydrogeological map is part of the 1:500 000 Hydrogeological map series of the Republic of South Africa.

This map is not to be used for the purpose of local borehole siting. Simplified lithology may be considered as guidelines only. Further geological information can be obtained from the Council for Geoscience. The map series is produced with ArcInfo software.

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Digital data, copies of this map and the accompanying brochure are obtainable from:
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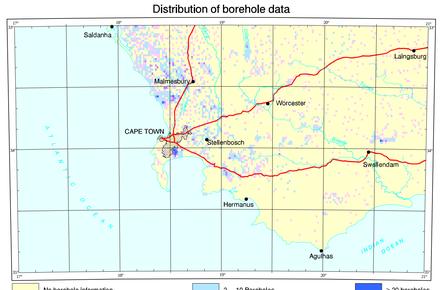
Distribution of borehole data

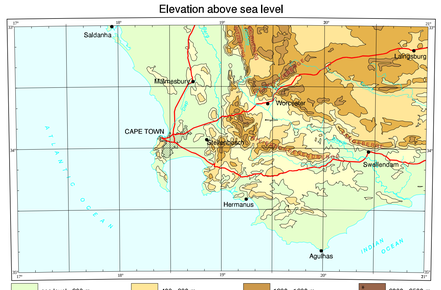


No borehole information
1 Borehole
2 - 10 Boreholes
11 - 20 Boreholes
> 20 boreholes

Borehole data points per 1 minute grid

1:2 000 000

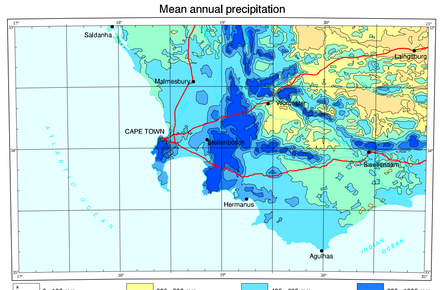
Elevation above sea level



sea level - 200 m
200 - 400 m
400 - 800 m
800 - 1200 m
1200 - 1600 m
1600 - 2000 m
2000 - 2500 m
2500 - 3000 m

1:2 000 000

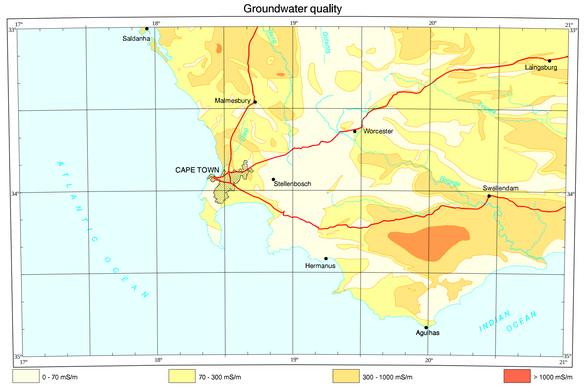
Mean annual precipitation



0 - 100 mm
100 - 200 mm
200 - 300 mm
300 - 400 mm
400 - 600 mm
600 - 800 mm
800 - 1000 mm
> 1000 mm

1:2 000 000

Groundwater quality



0 - 70 mS/m
70 - 300 mS/m
300 - 1000 mS/m
> 1000 mS/m

Electrical conductivity contour

1:1 500 000

Provincial boundaries
Feb 1996

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