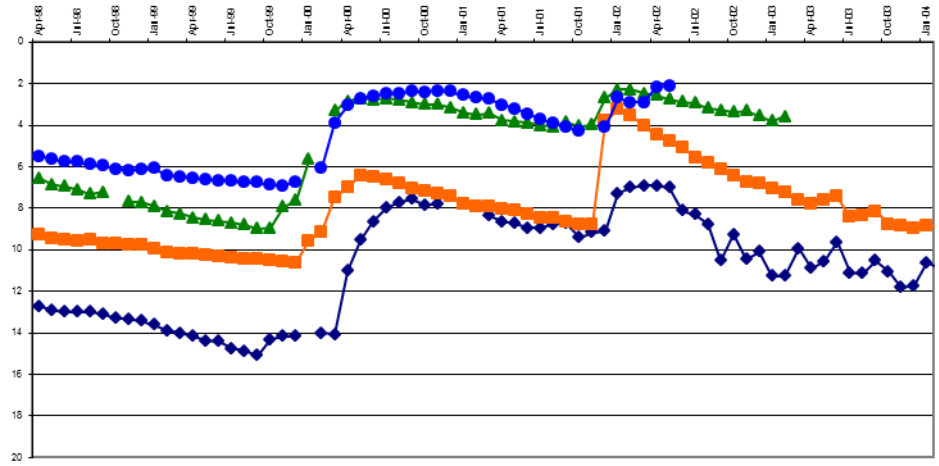
LIMPOPO REGION

QUARTERLY STATUS REPORT ON GROUNDWATER LEVEL TRENDS



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SUMMARY

It is midway into the dry season and as can be expected groundwater levels have generally been declining since the previous status report at the end of the wet season. The decline is mostly not significant over the past 3 months. The majority of groundwater levels are currently higher than the corresponding time last year. Available long-term data indicates that the overall groundwater situation is in a healthy state.

The groundwater situation in any area is dependent on local conditions, and deviations from the general trend are always present. The reasons for such deviations are not always clear and detailed investigations may be needed to understand the situation. In most instances however, the effect of water use and abstraction practices can be readily recognized in the groundwater level trend.

1. BACKGROUND

A total of 255 stations are monitored for water level on a quarterly interval and 41 on a half-year interval (MAP1)

The quarterly report on groundwater status is compiled from the data collected at 188 of the 190 stations on the permanent reference monitoring network. The data from 2 stations monitored in the Crocodile west-Marico Water Management Area (A2 drainage) is not included in the quarterly report.

Monitoring projects differ both in purpose and time frames and findings are reported at the conclusion of each project.

The number of stations, for both the network as well as projects, may vary from time to time due to loss of stations due to boreholes collapsing, invasion by tree roots, vandalism, flood damage and installation of pumping equipment by municipalities, other service providers or private individuals etc.

Groundwater level data for this report was collected during August 2013. All water level values used are that on the 1st of each month in question and taken at 12H00 in the case of electronic data. Where electronic data is not available the hand measurement taken during the site visit is used.

2. GROUNDWATER LEVELS

2.1 GROUNDWATER LEVEL TREND; MAY TO AUGUST 2013 (MAP 2)

May to August 2013

Total	190	Stations
Less A2 drainage	188	Stations

With data	182	Stations	97.0%

Water level			**Average**	**%**
Down	146	Stations	`-0.63m	80.20%
Up	34	Stations	0.3m	18.70%
Na change	2	Stations		
No Data	0	Stations		

182 Of the stations visited (97%) have data for both dates.

It is normal for this period, the dry season, to have groundwater levels declining and 80.2% (146 stations) do indicate lower groundwater levels with the average being 0.63m down. 18.7 % (34 stations) indicate slightly higher groundwater levels, average 0.3m higher.

2.2 GROUNDWATER LEVEL TREND; AUGUST 2012 TO AUGUST 2013 (MAP 3)

August 2012 to August 2013

Total	190	Stations
Less A2 drainage	188	Stations

With data	180	Stations	95.7%

Water level			**Average**	**%**
Down	64	Stations	`-0.67m	35.50%
Up	116	Stations	1.4m	64.50%
Na change	0	Stations		
No Data	0	Stations		

The current groundwater situation is generally better than the same time last year with the majority of stations 116, (64.5%) having higher water levels than the corresponding time last year, the average rise is 1.4m.

Lower water levels were recorded at 64 (35.5%) of the stations. The average is 0.4m lower.

3. TYPICAL GROUNDWATER LEVEL TREND THE PAST 6 YEARS (GRAPH 1, POSITIONS INDICATED ON MAP 4)

The general groundwater level trend typical over most of the province can be illustrated by GRAPH 1. The groundwater level trends of 4 different stations spread over a wide area are presented and indicate a very good correlation. As indicated in previous reports, the general trend is a slow declining one considered to be part of a natural long-term cycle presenting no reason for concern in most instances.

4. DEVIATIONS FROM THE GENERAL TREND

The trend is however altered in some instances due to various impacts or factors, the cause of which is not always readily apparent. Two examples are presented.

4.1 IMPACTS OF ABSTRACTION ON GROUNDWATER LEVELS

4.1.1 GROUNDWATER LEVEL TREND AT STATION A7BEAULE (GRAPH 2, POSITION INDICATED ON MAP 4)

This graph has been presented in a previous report but included again as an excellent example. The initial trend represent the familiar slow decline noted at most stations. The rate of decline since the start of nearby abstraction increased notably. The increase of depth of drawdown during pumping cycles can also be seen. Abstraction at rate cannot be sustained indefinitely under current conditions.

4.2 ACCELERATED RATE OF DECLINE WITH NO DISCERNABLE DIRECT PUMPING EFFECT OR APPARENT LARGE-SCALE ABSTARCTION NEARBY.

4.2.1 GROUNDWATER LEVEL TREND AT STATION B8SEKGOPO (GRAPH 3, POSITION INDICATED ON MAP 4)

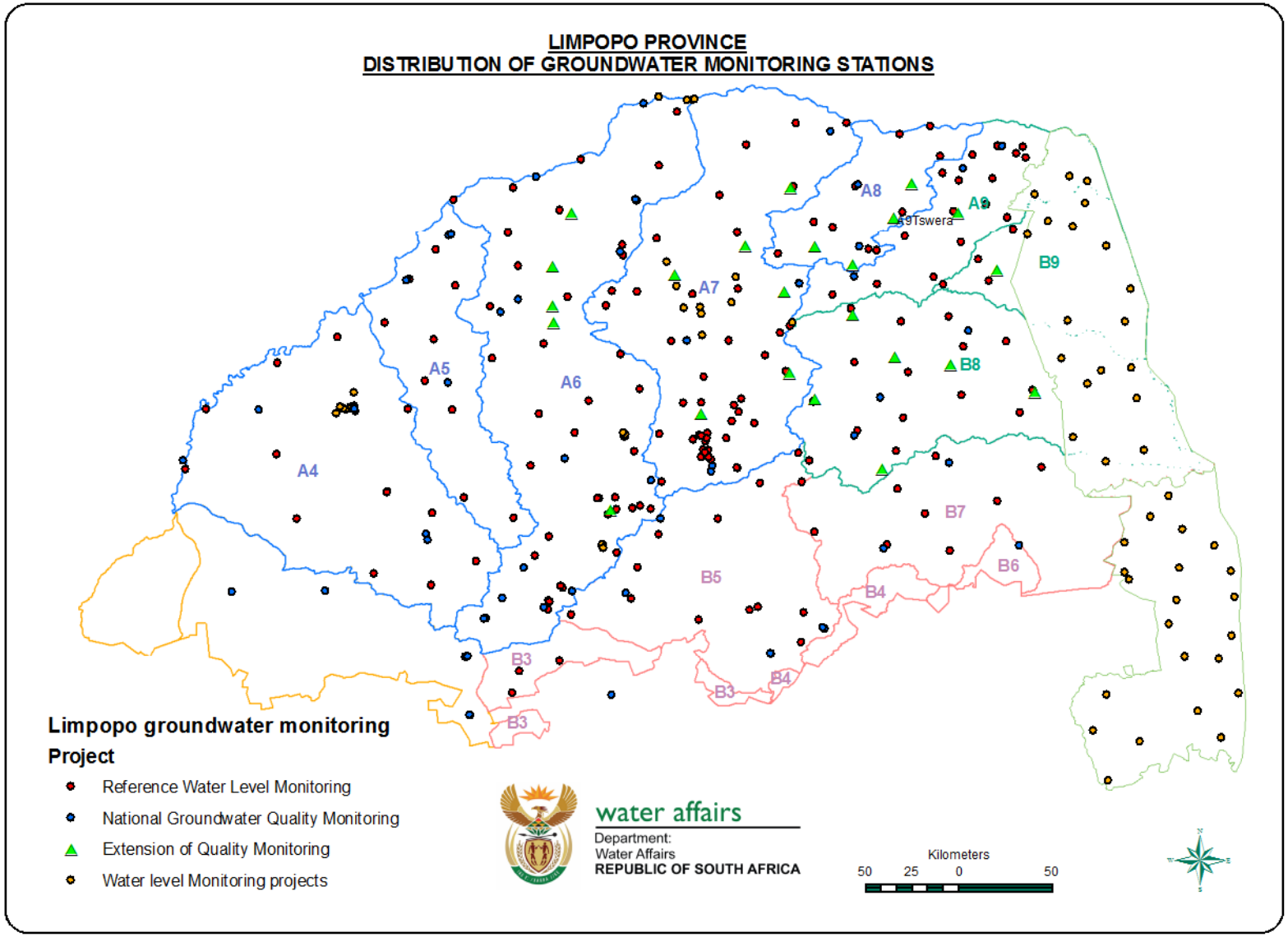
The groundwater level at this station has been declining at a greater rate than noted as the general trend. Regular seasonal recharge which is quite clear on GRAPH1 is virtually absent here. Evaluation of the water level data indicates no direct pumping effect. Site investigation did not reveal any abstraction in the immediate vicinity of the station.

The station is located in quaternary catchment B82A and the nearest irrigation is in the adjoining B82B catchment along the Koedoes River 4,5 kilometres away. The irrigation water is apparently abstracted from the dam in the river.

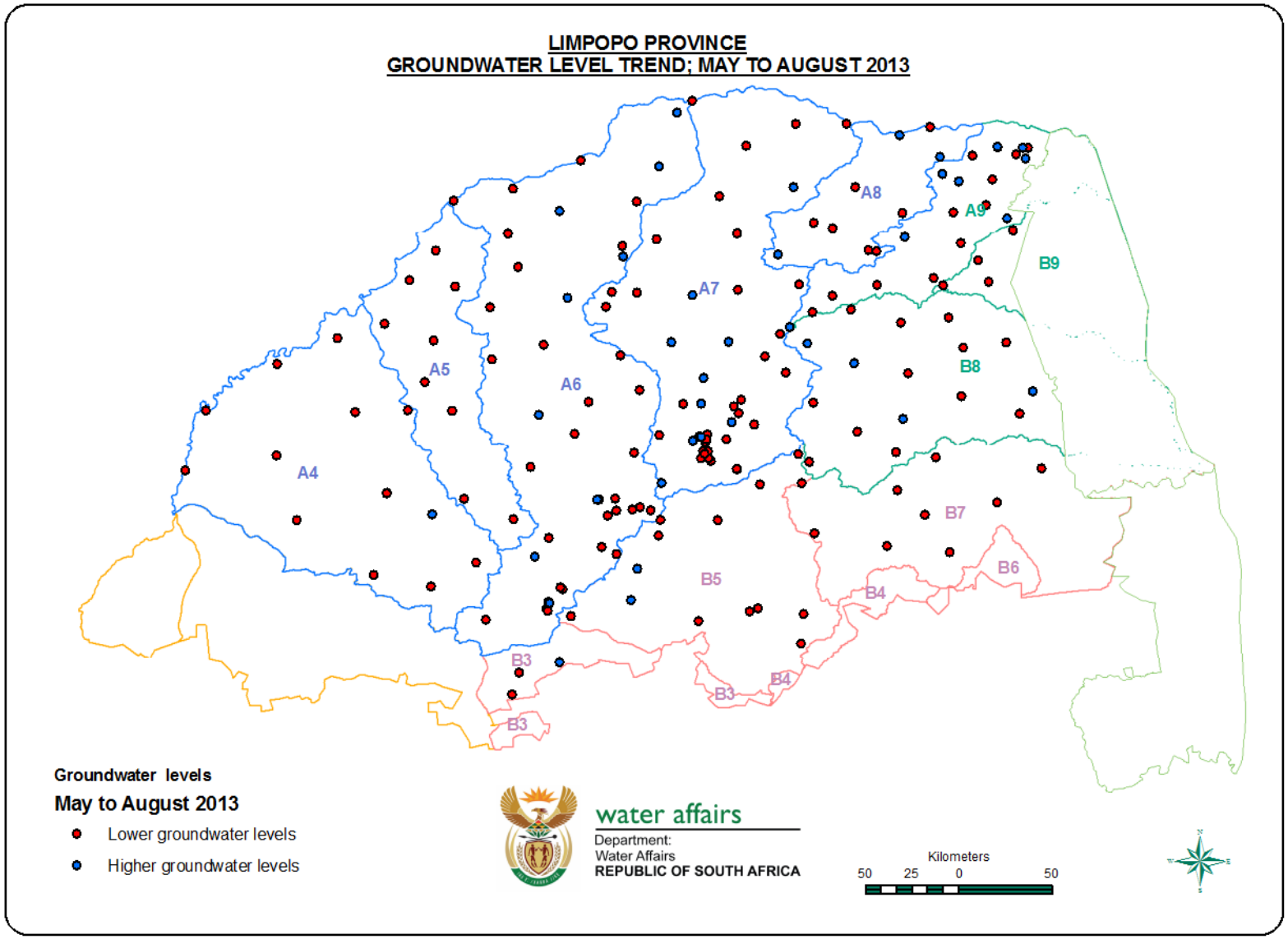
An investigation of the area has to be undertaken.

5. IMPORTANCE OF GROUNDWATER MANAGEMENT

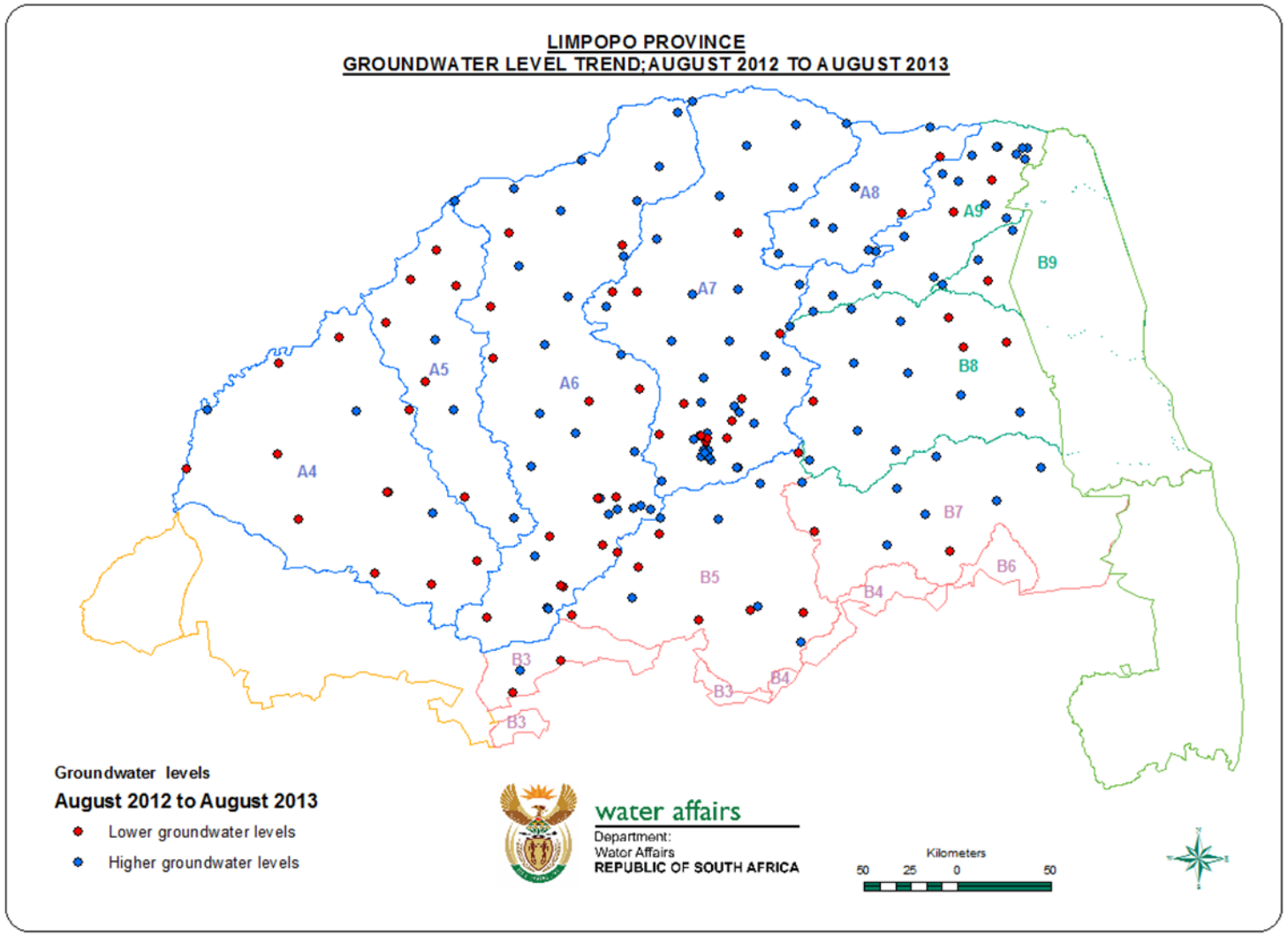
The above graphs illustrates that if groundwater level trends are not monitored it is impossible to know how the source is reacting and whether abstraction can be sustained. Sound aquifer management is of utmost importance if groundwater is to be utilized sustainably.


LIMPOPO PROVINCE
DISTRIBUTION OF GROUNDWATER MONITORING STATIONS
A4
A5
A6
A7
A8
A9
B9Tswera
B9
B8
B7
B6
B5
B4
B3
B4
B3
B3
Limpopo groundwater monitoring
Project
Reference Water Level Monitoring
National Groundwater Quality Monitoring
Extension of Quality Monitoring
Water level Monitoring projects
water affairs
Department:
Water Affairs
REPUBLIC OF SOUTH AFRICA
Kilometers
50 25 0 50

MAP 1

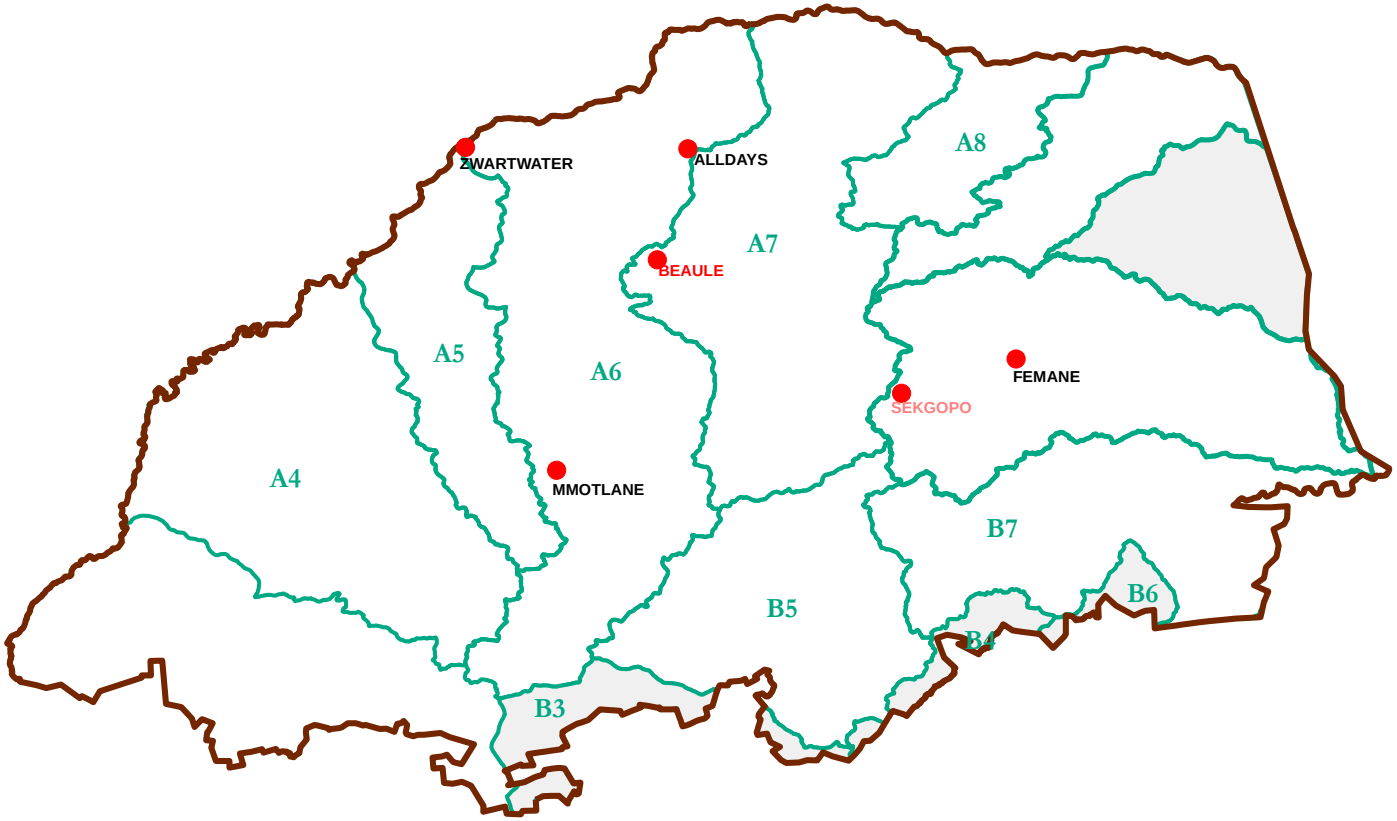

LIMPOPO PROVINCE
GROUNDWATER LEVEL TREND; MAY TO AUGUST 2013
A4
A5
A6
A7
A8
A9
B3
B4
B5
B6
B7
B8
B9
Groundwater levels
May to August 2013
Lower groundwater levels
Higher groundwater levels
water affairs
Department:
Water Affairs
REPUBLIC OF SOUTH AFRICA
Kilometers
50 25 0 50

MAP 2


LIMPOPO PROVINCE
GROUNDWATER LEVEL TREND; AUGUST 2012 TO AUGUST 2013
A8
A9
B9
A7
A5
A6
B8
A4
B7
B6
B5
B4
B3
B4
B3
B3
Groundwater levels
August 2012 to August 2013
Lower groundwater levels
Higher groundwater levels
water affairs
Department:
Water Affairs
REPUBLIC OF SOUTH AFRICA
Kilometers
50 25 0 50

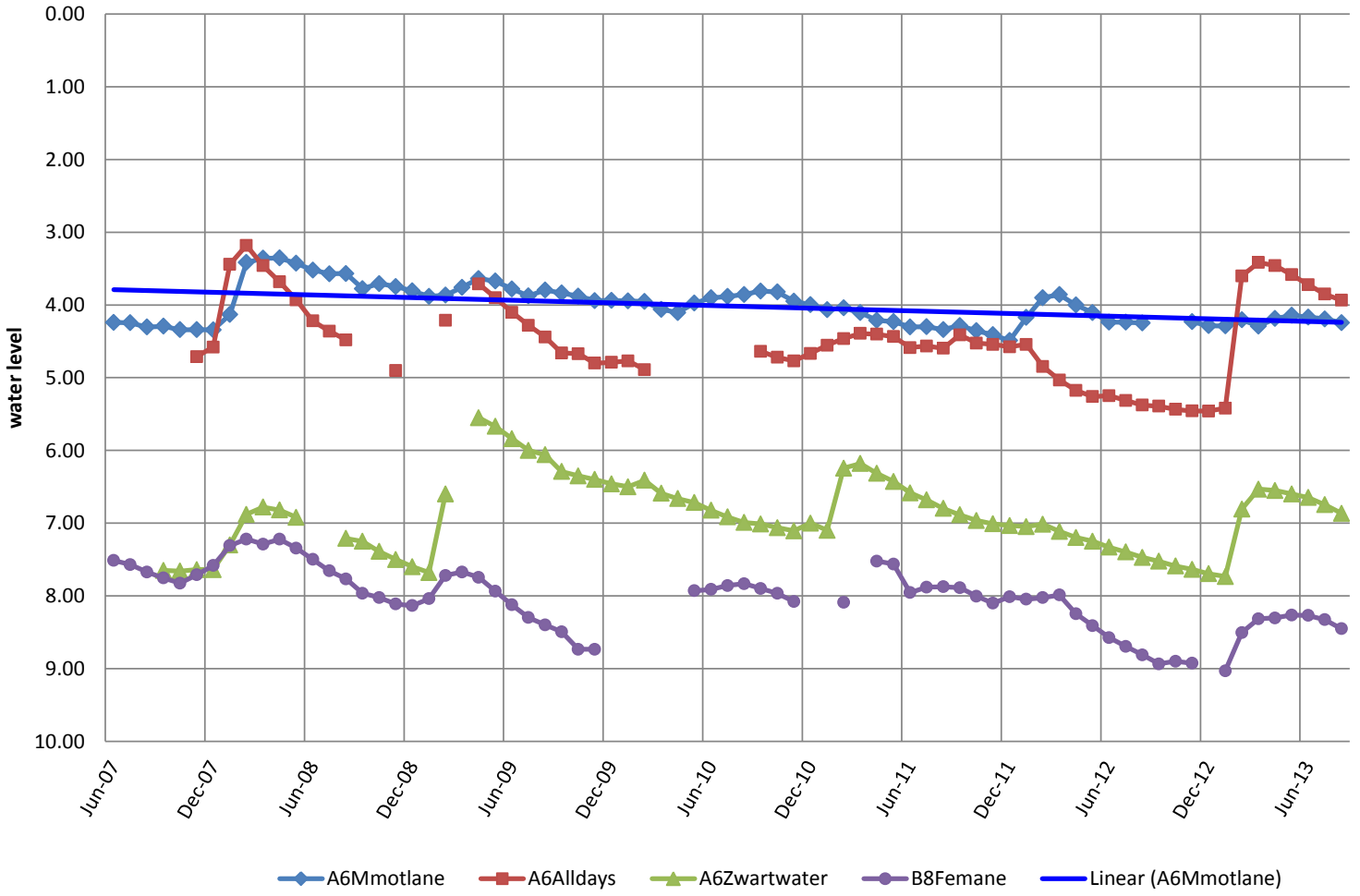
MAP 3

POSITIONS OF STATIONS USED IN GRAPHS 1, 2 & 3

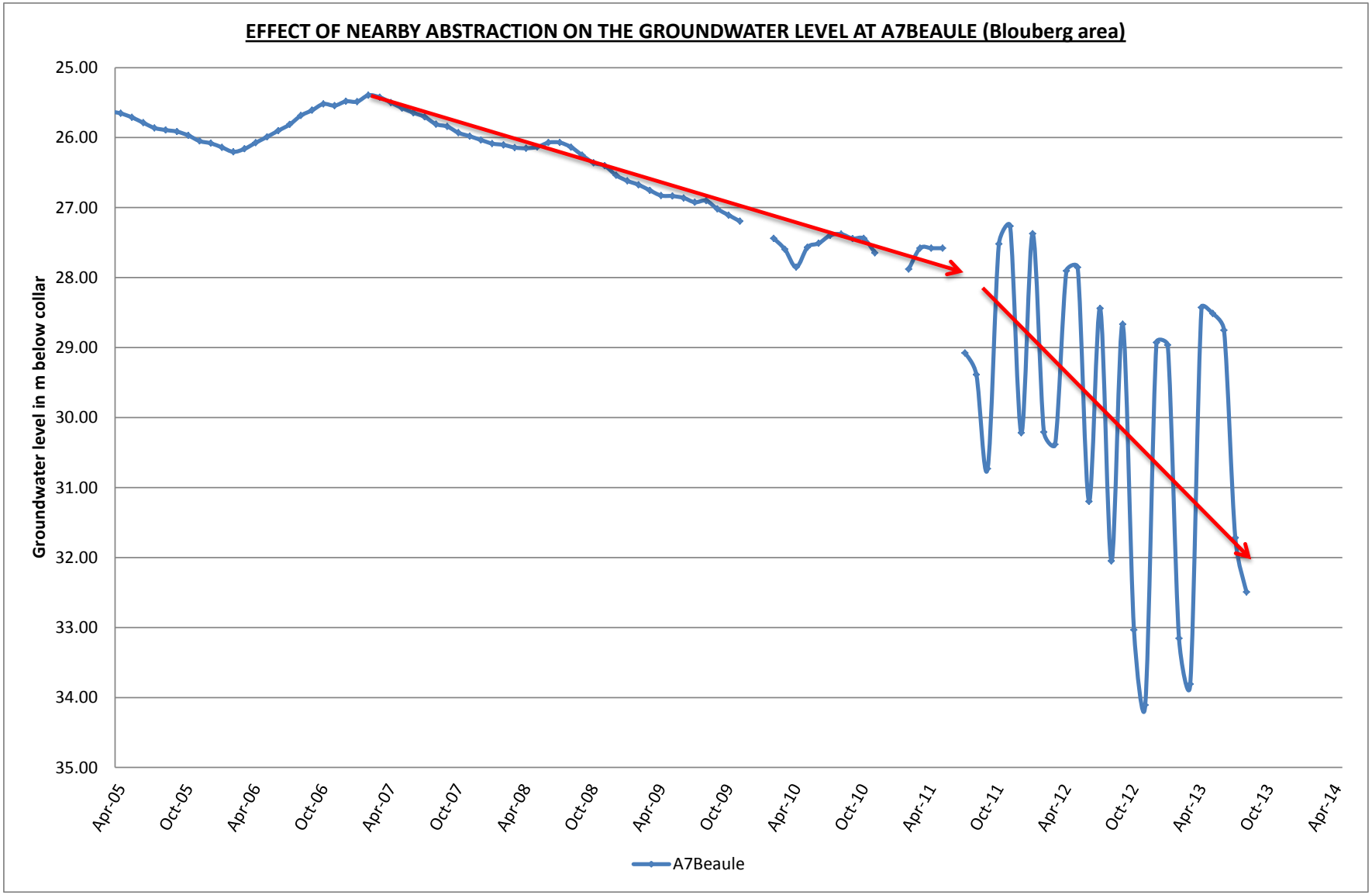


MAP 4

Typical groundwater level trend over the past 6 years

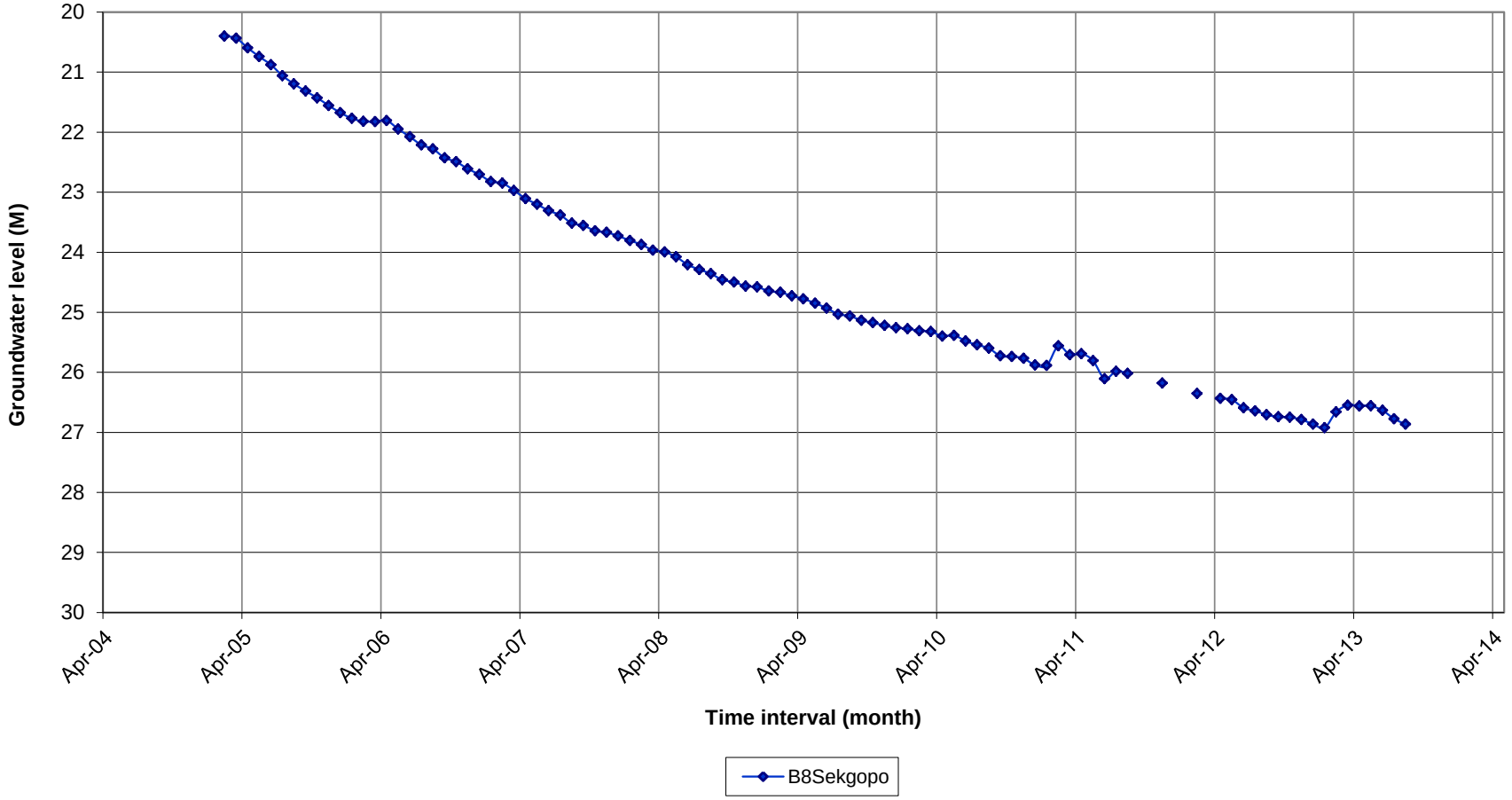


GRAPH 1


EFFECT OF NEARBY ABSTRACTION ON THE GROUNDWATER LEVEL AT A7BEAULE (Blouberg area)
Groundwater level in m below collar
25.00
26.00
27.00
28.00
29.00
30.00
31.00
32.00
33.00
34.00
35.00
Apr-05
Oct-05
Apr-06
Oct-06
Apr-07
Oct-07
Apr-08
Oct-08
Apr-09
Oct-09
Apr-10
Oct-10
Apr-11
Oct-11
Apr-12
Oct-12
Apr-13
Oct-13
Apr-14
A7Beaule

GRAPH 2

B8 DRAINAGE
Groundwater level time series of station B8 Sekgopo



GRAPH 3