H01

ENVIROXCELLENCE SERVICES CC

Consulting Geohydrological and Environmental Scientists

2.2(3861.)

PROMOTING SUSTAINABLE USE OF OUR NATURAL RESOURCES

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GROUNDWATER SOURCE EVALUATION FOR THE VILLAGES OF DROOGTE, MADISHA LEOLO, MAGATLE AND MAPATAKENG.

Prepared for:

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GROUNDWATER SOURCE EVALUTION FOR THE VILLAGES OF DROOGTE,MADISHA LEOLO, MAGATLE AND MAPATAKENG IN ZEBEDIELA,LIMPOPO PROVINCE.

Tables

Table 1: Management Recommendations

1 Introduction

Enviroxcellence Services was appointed by Tshedza Consulting Engineers to carry out groundwater source assessment in the following villages in Zebediela area:

Magatle
Mapatakeng
Madisha Leolo
Droogte

The works involved testing of a total of eight boreholes. The approach was to subject the boreholes to calibration, multi-rate step test and a constant discharge rate of 24 hours.

2 Locality

The area of Zebediela is about 80 kilometers south of Polokwane and the project area is within a 10 kilometer radius.

3 Geology

The area is mainly covered by the Nebo granites of the bushveld complex and to the west by the limestones of the Chuieniespoort group of the Transvaal sequence.

4 Pump Testing

All the boreholes were subjected to calibration, multirate step test and constant rate discharge.

4.1 BH H01-1345 (Droogte Village)

The borehole was subjected to two calibration steps of 15 minutes each at 0.1 and 0.2 l/s respectively and one step test of 0.2 l/s for 60 minutes. A constant discharge rate of 0.3 l/s was carried out for 24 hours and the borehole was allowed to recover for 360 minutes to 95%.

4.2 BH H01-1267 (Droogte Village)

The borehole was subjected to two calibration steps of 15 minutes each at 0.1 and 1 l/s respectively and one step test of 1.5 l/s for 60 minutes. A constant discharge rate of 1.45 l/s was carried out for 16 hours and the borehole was allowed to recover for 15 minutes to 97%.

4.3 BH H01-1285 (Magatle Village)

The borehole was subjected to a step test of 120 minutes at a yield of 0.18 l/s and allowed to recover for 60 minutes to 99%. The borehole had a small draw-down of less than 4m probably due to collapse.

4.4 BH H01-1290 (Mapatakeng Village)
The borehole was subjected to three calibration steps test of 15 minutes each at a yield of 0.14, 0.4, and 0.5 l/s respectively and allowed to recover for 210 minutes to 99%. It was later subjected to a constant discharge rate of 0.19 l/s for 8 hours and allowed to recover for 1080 minutes to 99%.

4.5 BH H01-2345 (Madisha Leolo Village)
The borehole was subjected to two calibration steps of 15 minutes each at 0.1, 0.2 l/s respectively and one step test of 0.4 l/s for 60 minutes and allowed to recover to 95%. A constant discharge rate of 0.35 l/s was carried out for 24 hours and a recovery of 1080 minutes was recorded to 96%.

4.6 BH H01-1189 (Madisha Leolo Village)
The borehole was subjected to two calibration tests of 15 minutes each at 0.17 and 0.2 l/s respectively and a constant of 0.15 l/s was carried out for 24 hours with recovery of 1440 minutes to 71%.

4.7 BH H01-1282
This borehole was subjected to a 24 hour constant at 12 litres per second and allowed to recover to 99%.

4.8 BH H01-1286
This borehole was not tested as a result of the old pipes which have fallen in the hole. Arrangements should be made to fish the old pipes.

5 Water Chemistry

The water chemistry will be forwarded to your company as soon as the laboratory results are available.

6 Management Recommendations

The management recommendations for utilization could be interpreted as below:

Table 1: Management Recommendations

BH Number	Village	Water Level (m)	Pump Depth (m)	Yield l/s	Duty Cycle(Hours)	Comments
H01-1345	Droogte	12.99	30	2	8	
H01-1267	Droogte	10.04	30	2	8	
H01-1285	Magatle	19.75	The borehole was tested successfully, but has a very small draw-down of less than 4m. The borehole has probably collapsed.			
H01-1290	Mapatakeng	12.4	20	> 0.1 l/s	Suitable for Hand Pump	

H01-2345	Madisha	9.88	25	> 0.1 l/s	Suitable for Hand Pump	
H01-1189	Madisha	5.94	30	0.15	8	
H01-1282	Magatle	20.9	35	2	12	