

## LIMPOPO GROUNDWATER RESOURCE INFORMATION PROJECT (GRIP)

Groundwater plays a major role in South Africa and in rural areas millions of people are dependent on groundwater. Questionable data sets almost always lead to incorrect assumptions about groundwater use and sustainability. The South Africa Integrated Water Resource Management (IWRM) requires verified groundwater data sets and data need to be captured in a manner that serves the needs of both the National Water Act (NWA) and the Water Services Act (WSA). Therefore, when developing a Water Services Development Plan (WSDP) for a district municipality where groundwater plays a strategic role, the data need to be available to the water management authority in a format that is usable for the district municipality. Data requirements have to include water service needs such as infrastructure information, accurate spatial distribution, sustainable yields, and management requirements. However, the WSDP for Bohlabela District Municipality (2005) clearly shows that available groundwater data and spatial distribution thereof are questionable. Data also need to satisfy the requirements of the National Water Resource Strategy (NWRS) and future Catchment Management Strategies (CMSs), and include more traditional hydrogeological data such as recommended yields, strike depths, transmissivity, storativity, aquifer type, etc. Limpopo is one of the poorest provinces in South Africa, but also one of the areas in South Africa where groundwater is most widely used as the only domestic water supply. In Limpopo alone some 30 boreholes are drilled per day and data from only a number of newly drilled boreholes are ever captured by the Department of Water Affairs and Forestry (DWAF).

In view of the above Limpopo initiated and implemented GRIP in 2002 and thus became the first province in South Africa to do so. GRIP is a systematic approach to gather, verify, upload and use data to improve management and development of rural groundwater resources in South Africa. The project comprises four phases of which the desk study, field survey, data verification and the establishment of an Internet website for data access and download have been completed. The GRIP data can be accessed and downloaded on the following Internet address: [www.groundwaterdata.co.za](http://www.groundwaterdata.co.za). GRIP was designed to serve water resource management, supply and planning purposes and divided into the four following logical phases:

### **Phase 1: Data collection**

- Establishment of a hydrocensus team
- Establishment of project management committee
- Gathering of existing borehole information (existing reports)
- Development of practical field forms
- Establishment of an Internet information support service
- Conduct field survey
- Capture data in hard copy
- Capture and disseminate data electronically
- Verify data
- Supply data to provincial database

### **Phase 2: Assessment of existing data**

- Consolidate new and existing borehole data
- Analyse regional and structural geology using aerial photographs, remote sensing data, geological data, and regional and structural geology field data
- Do a comprehensive borehole data assessment and include borehole distribution, groundwater use, and water levels, flow directions, water quality, etc. ArcView and Spatial Analysis as well as other appropriate technologies
- Capture and interpret available borehole yield test data and identify any further borehole yield test sites
- Conduct borehole yield tests

- Report per district municipality with the following outputs: water quality map, sanitation/protection zoning map; revised harvest/exploitation potential map, groundwater resources map, geological structures and borehole yield relationship, groundwater target map, etc.
- Identify and implement monitoring zones
- Populate and update provincial database.

### **Phase 3: Target identification, drill and test**

- Select targets for groundwater development using results from phases 1 and 2
- Drill exploration holes to test and confirm potential at the selected targets.
- Conduct borehole yield tests on selected successful boreholes and analyse results to establish aquifer characteristics and sustainable supply available from various aquifers.
- Consolidate results with Phase 1 and 2.
- Populate and update provincial database

### **Phase 4: Deliverables and reporting**

- Quality of the groundwater (map)
- Potential targets for well-field development (map)
- Sustainable 24-hour abstraction rate per target plus number of boreholes required per target to maintain well-field yields (map)
- Daily, monthly and annual available volumes of groundwater
- Existing infrastructure (reservoirs, pipelines, pumps, etc.)
- Sanitation status, recommended protection zoning of groundwater abstraction points, well-fields and recharge areas as well as potential pollution threats (map)
- Development cost per target
- A groundwater management plan
- Classification of the groundwater resources, quantification of the Reserve and resource quality objectives
- An operation and maintenance plan
- Populate and update provincial database
- Implementation of REGIS Africa in Limpopo
- Establishment of a groundwater service centre
- Establishment of standard tender documents for hydrogeological component, drilling, borehole yield testing and equipping of boreholes