MALREN GEO
FOR SATISFACTORY GEO-SERVICES

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Hydrogeology Services

Groundwater Desktop Studies

- ❖ **Accurate delineation of groundwater characteristics through continuous investigation and monitoring**
- ➢ **<u>This includes</u>:**

- Hydrogeological reconnaissance and data collation (e.g. spatial data sets, relevant public data, remote sensing data).
- Groundwater-Surface water interaction assessment/investigation.
- Groundwater resource potential (i.e. identify preliminary targets).
- Hydrogeological gap analysis.
- Field/Site investigations.
- Regional to local water resource studies.
- Collection, modelling, monitoring and management of data (including the setup of a database system and integrating it with those of other sub-services and divisions).

Exploration, Supply and Management of Groundwater

- ❖ **Effective development and management of groundwater resources**
- ➢ **<u>This includes</u>:**

- Geological models (i.e. Conceptual and 3D geological models based on existing borehole logs, geological maps, etc.).
- Hydrogeological exploratory investigation (hydrocensus) to identify areas with high groundwater potential, conduct geophysical surveys, data interpretation.
- Exploratory drilling (if there are no existing boreholes) and pump testing.
- Numerical Groundwater model (i.e. Conceptual groundwater modelling, numerical models (conduct abstraction scenarios) and provide recommendations.
- Development, planning and implementation of dynamic groundwater drilling programmes (including budgeting, borehole designs, collar and positioning, as well as contracting and management of drilling personnel).
- Borehole/well-field design and cost estimation.
- Conceptual groundwater modelling (i.e. flow estimations, etc.).
- Design of groundwater monitoring wells and stations network (i.e. pump tests, as well as testing, monitoring and managing the quality of the water, quality parameters and quantity to be abstracted).
- Development and application of QA/QC procedures (i.e. effectiveness of the drilling program, desktop study's methodology, correct and uniform database capturing and documentation).

Mine Dewatering

- ❖ **Enhances mine safety and maintains efficient and effective production.**
- ➢ **<u>This includes</u>:**

- Accurate delineation of water sources, flows and extents of water on small-scale operating mines through continuous investigation and monitoring.
- Development, planning and implementation of underground and open-pit dewatering programmes for small-scale operating mines.
- Designing, installation and discharge management of dewatering wells.

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Database Setup and Management

- ❖ **A system that ensures accurate and uniform data capturing, validation, integration and management across a wide range of hydrogeology sub-services and various MalRen Geo Divisions.**
- ➢ **<u>This includes</u>:**
- Setup and management of a customised hydrogeology database system.
- On-site or office-based data collection and capturing.
- Integrated information systems and their management.
- Data validation and application of QA/QC procedures.

Project Audit and Evaluation

- ❖ **Due diligence investigations – Overall verification and validation of the quality of the hydrogeology data and any associated project risks.**
- ➢ **<u>This includes</u>:**
- Application of due diligence studies of groundwater exploration projects.
- Overall project risk assessments and potential opportunities.
- Contracting of Competent and Qualified Persons for verification and validation.