

**AN ENVIRONMENTAL, GEOLOGICAL (GEOTECHNICAL)
HYDROGEOLOGICAL & GIS CAPABILITY STATEMENT
2016**



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1 COMPANY OVERVIEW

GeoQuest is a fully independent Consultancy Group based in Zambia (company incorporated in 2000) and Democratic Republic of Congo (company incorporated in 2005) providing high quality, efficient, cost effective and innovative Environmental (including Social-Environmental), Geological (geotechnical), Hydrogeological & GIS services.

The company provides expertise to the Construction, Agricultural, Mining - Exploration, Environmental, and Water Development Sectors in Zambia and Central / Southern Africa.

GeoQuest is made up of a dedicated core team of Zambian and DRC based professionals (including Zambian and DRC nationals as well as expatriates). The group provides select, hands on, multi-disciplinary teams and / or individuals including Environmental Scientists, Geoscientists and Technicians tailored to meet the particular requirements and needs of each client. It is committed to providing high quality and cost effective technical as well as full or partial project management services.

Since its formation, GeoQuest has provided a very wide variety of both field and office based Geological, Hydrogeological and Environmental Consultancy Assignments.

GeoQuest is fully registered with The Zambia Environmental Management Agency ('ZEMA') to provide Professional Environmental Services in Zambia.

GeoQuest is also fully licensed by the Engineer's Registration Board ('ERB') to practice Engineering (Professional Geology, Hydrogeology and Environmental Services) in accordance with Cap 432 of The Laws of Zambia.

In addition, GeoQuest is registered as a corporate member of the Geological Society of Zambia ('GSZ'), and all geoscientists working for GeoQuest are registered members of the Geological Society of Zambia.

Further information about any of the above can be provided upon request by contacting jdgreen@geoquest.co.zm

2 OUR ENVIRONMENTAL CAPABILITIES

GeoQuest's Environmental Department specialises in a range of environmental services aimed at assisting in the planning and design of new development projects and the management and monitoring of existing operations.

Our areas of expertise include:

- Environmental Project Briefs (EPB) – Projects with a low environmental impact
- Environmental Impact Statements (EIS) – Projects with a high environmental impact
- Sociological Impact Studies and Public Consultations
- Project Management
- Environmental Monitoring Programmes: Surface & Groundwater, Air (NO₂, SO₂ & Radon), Dust, Sediment and Soil, Acid Rock Drainage tests, Noise, Radiation, Aquatic & Terrestrial Flora and Fauna
- Environmental and Compliance Auditing

- Waste Management Programmes
- Groundwater investigations
- Designing Environmental Management Plans
- Designing Environmental Monitoring programmes
- Emergency Response Plans and Staff Training
- Approvals and licensing

3 OUR GEOLOGICAL (GEOTECHNICAL) HYDROGEOLOGICAL & GIS CAPABILITIES

GeoQuest (singularly and with key associates) also provides a wide range of Geological (geotechnical), Hydrogeological and GIS services.

Our areas of expertise include:

3.1 Geological (Geotechnical) & Hydrogeological Services

- Geological & Geotechnical Site Assessments (Geological / Soil Mapping, Profiling, Testing and Analysis)
- Groundwater Resources Assessment and Evaluation Studies
- Borehole Siting
- Ground Geophysics (including ground Magnetism and Resistivity as well as other applications eg - VLF, EM & Ground Penetrating Radar)
- Hand Held GPS & DGPS Surveying
- Drilling Contractor Procurement / Selection and Liaison
- Supervision and Management of Well Drilling, Construction and Development
- Hydraulic Test Pumping
- Well Field Design & Monitoring

3.2 GIS Services

GeoQuest can provide GIS / Database solutions for the integration, management and modelling of both geological and non-geological (eg Environmental) spatial data including airborne and ground geophysical surveys, geological, geochemical, aerial photography and satellite imagery.

Services Include:

- Data capture, compilation and verification
- Data conversion (projection and datum)
- Mapping and final map production
- Information integration and target generation
- Setup, maintenance and management of project and countrywide GIS databases
- Scanning and digitising (up to A0) including geo-referencing
- Specialist knowledge of ArcView and MapInfo Professional Software Ongoing Database Management

4 HISTORICAL TRACK RECORD

We provide below a more comprehensive list of selected Geological / Geotechnical, Environmental and Social Projects which GeoQuest has completed within Zambia over the past 5 years:

4.1.1 *Key Geological (Geotechnical) Assessments:*

- Copperbelt University: Geotechnical Site Investigation for New Proposed Accommodation Buildings and Sports Field at the Copperbelt University, Kitwe. **Job just awarded.**
- Zambian Breweries PLC: Phase 1 - A Geological / Geophysical Investigation of Properties – Stands A24, A15, A11, A12, A13, A14 and A25 within the Lusaka South Multi Economic Zone (MFEZ) For a Proposed Malting Plant. 2014
- Zambian Breweries PLC: Phase 2 - A Water Evaluation & Site Investigation Report of Properties – Stands A24, A15, A11, A12, A13, A14 and A25 within the Lusaka South Multi Economic Zone (MFEZ) For a Proposed Malting Plant. 2014
- A First Pass Geological / Geotechnical Assessment of the Site for the Proposed Feed Mill and Grain Silos at Nampamba Farms, Mpongwe District, for Zambeef Products PLC
- The Royal Norwegian Embassy: Geotechnical / Geophysical Investigation of Plot Sub Division B of Sub Division 45 of farm 377A, Woodlands, Lusaka. 2010

4.1.2 *Key Environmental Impact Assessments and Monitoring Exercises:*

- Intrepid Mines Limited: Environmental Monit
- Denison Mines Zambia: Implementing Denison Mines (Z) Limited's Environmental Monitoring Program for the Mutanga Project. **Ongoing Job since 2012**
- Kansanshi Mining Plc: Assessment and Recommendations for Groundwater monitoring at Kansanshi Mine. 2013
- First Quantum: Environmental Impact Statement for the Sentinel, Intrepid and Enterprise Projects. 2012
- Mwembeshi Resources: Environmental Impact Statement for Large Scale Mining Activities under License Number 15547-HQ-LML in Luangwa District. 2012
- First Quantum (Kansanshi): Environmental Audit for the Environmental Protection Fund. 2011
- AERL: Implementing African Energy Resources Limited's Environmental Monitoring Program for the Chirundu Uranium Project. 2009

4.1.3 *Key Economic and Social Sustainability Studies:*

- Astrium / InfoTerra: Farmstar Goes Global. Corporate entrepreneurship bringing sustainable value innovation to agribusiness. 2012
- The Economic Growth Engine. How Useful Creates Material Prosperity. Professor Robert Ayres and Dr. Benjamin Warr. Edward Elgar. 2009
- First Mile Innovation, Leveraging Social Capital and a Fragmented Supply Chain. Part A & B. Assessing Energy Ventures in Emerging Markets. 2006

4.1.4 *An Example of Some of the Environmental Project Briefs GeoQuest has Conducted:*

- Bushbuck Resources: 15 Environmental Project Briefs different Large Scale Prospecting Licenses
- Bolllore Africa Logistics: An Environmental Project Brief for Bolllore Chingola Logistics Hub

- MMG Zambia Limited: 14 Environmental Project Briefs for different Large Scale Prospecting Licenses
- Blackthorn Resources: 6 Environmental Project briefs different Large Scale Prospecting Licenses
- KPR Investments: 5 Environmental Project Briefs for different Large Scale Prospecting Licenses
- Grassroots Resources: 7 Environmental Project Briefs for different Large Scale Prospecting Licenses
- Lafarge PLC: 2 Environmental Project Briefs for Alternative Fuels
- Rift Petroleum/Tower Resources: 2 Environmental Project Briefs for Large Scale Oil and Gas Prospecting Licenses.
- BHP Billiton: 12 Environmental Project Briefs for different Large Scale Prospecting Licenses
- Vale Zambia Limited: 4 Environmental Project Briefs for different Large Scale Prospecting Licenses
- Rio Tinto: 8 Environmental Project Briefs for a Large Scale Prospecting License
- Phelps Dodge: 2 Environmental Project Briefs for different Large Scale Prospecting Licenses
- Katanga Resources: 4 Environmental Project Briefs for different Large Scale Prospecting Licenses
- Zambezi Resources: 2 Environmental Project Briefs for different Large Scale Prospecting Licenses
- A variety of other Medium and Small Scale Companies: 22 Environmental Project Briefs for different Large Scale Prospecting Licenses.

4.1.5 *An Example of Some of the Environmental Audits GeoQuest has Conducted:*

- Intrepid Mines Ltd: An Independent Environmental Audit of Operations in License areas 16385-HQ-LPL, 14265-HQ-LPL, 14266-HQ-LPL and 14267-HQ-LPL. 2015
- First Quantum (Kansanshi): An Environmental Audit of Kansanshi Mine Plc for the Environmental Protection Fund. 2011
- Environmental Council of Zambia: Development of Environmentally Sound Solid Waste Management Practices in Zambia. 2010
- Zambia Information and Communication Technology Authority ('ZICTA'): A National Baseline Survey to Establish the Level of Compliance with the Set National Human Exposure Safety Limit. 2010

4.1.6 *An Example of Some Pending Environmental Impact Assessment Projects:*

- Intrepid Mines Ltd: EIA and compilation of an Environmental Impact Statement for the Limestone Quarry and Relocation of the Road, Kitumba, Zambia. 2015
- North West Rail Company Limited: Environmental and Social Impact Assessment for the proposed New Railway line. 2015
- ZESCO: Consultancy Services for the Kafue Gorge Dam Spillway Repair Works. 2015
- ZESCO Consultancy Services as Implementation Engineer (IE) for the Chishimba Falls Hydropower Rehabilitation and Extension Project. 2015

5 OUR CLIENTS

In the Geological (Geotechnical), Environmental & Hydrogeological Sectors GeoQuest's clients have included:

- Agriflora Farms
- African Energy Resources Limited
- Agvan Farms
- Albidon Limited
- African Infrastructure Consultants (AICON),
- BHPBilliton
- Blackthorn Resources Limited
- Bonanza Farms
- Bolloré Africa logistics Limited
- Bushbuck Resources Limited
- Centre for Infectious Disease Research
- Chilanga Cement (Lafarge Cement Zambia PLC)
- Christian Vision
- Cena Farms
- Chivuna Mission School and Clinic
- Civil Concepts (Pty) Limited
- Copperbelt University
- Denison Mines
- Department of Water Affairs
- Enviro-Flor Farms
- Environmental Council of Zambia
- Intrepid Mines Limited
- John Ken Estates
- Kagem Mining Limited
- Khamazi Farms
- Kansanshi Mining Plc
- Rift Petroleum/Tower Resources
- Lusaka Water and Sewerage Company
- Ministry of Mines and Mineral Development (Mines Safety Department)
- MMG Exploration (Zambia) Ltd
- Mukubwa Resources Limited National Resource Development Centre
- Nyati Milling
- Optiquet Corporation Limited
- Rio Tinto Exploration Ltd
- Scimitar Farms
- The Royal Norwegian Embassy
- Wangwa Farms
- Waterbuck Resources Limited
- York Farms
- Zambeef Products PLC
- Zambian Leaf Tobacco Company
- Zambian Air Force
- Zambian Breweries PLC (SABMiller PLC)
- Zambian Communications Technology Authority (ZICTA)
- ZCCM-IH
- World Bank

GeoQuest has worked closely at times or in strategic alliance with other consultancy groups including MDM Engineering CSA, FinOre, Norconsult, RSG Global, SRK, Snowdens, Venmyn-Rand, Wardell-Armstrong and WE-Consult.

