

# **COMPANY PROFILE**

## **ENVIRONMENTAL, GEOTECHNICAL ENGINEERING AND GEOHYDROLOGICAL CONSULTANTS**

### **INTRODUCTION**

This submission provides a brief introduction to the environmental and geotechnical services that **Terratest (Pty) Ltd**, can offer. The staff includes qualified and experienced *environmental scientists, geotechnical engineers, engineering geologists, geohydrologists, geophysicists and professional engineers who have specialised in hydrology and geohydrology.*

Our firm has offices in Durban, Pietermaritzburg, East London and Port Elizabeth.

### **FIELDS OF ENVIRONMENTAL EXPERTISE**

#### ***Environmental Impact Assessments (EIAs)***

The firm has undertaken a variety of Basic Assessment Reports and EIAs in terms of Integrated Environmental Management (IEM) procedure and in conjunction with the old Regulations of the Environment Conservation Act 73 of 1989. The Regulations include Section 21 (List of Identified Activities), Section 22 (Prohibition) and Section 26 (Regulations) and recently amended National Environmental Management Act (Act No. 107 of 1998) Regulations. The “list of identified activities” covers virtually every form of development in South Africa.

#### ***Environmental Management Programmes (EMPs)***

In terms of the Minerals Act 50 of 1991 an approved EMP Report is required for every quarry, mining, sand-winning or prospecting activity. The firm has successfully completed numerous EMP's for private bodies and public authorities.

#### ***Other Environmental Capabilities***

There are many aspects to environmental work and, in line with international trends and changes to South African law, it is important that standards are maintained across the spectrum. To this end environmental review and auditing are important facets. Our company has experience in these areas of work. We also undertake *environmental baselining, scoping and auditing*. Audits may include pre-acquisition, compliance and waste audits.

Environmental Management Systems (EMS), e.g. ISO 14001, can be applied to any sphere of business and demonstrates commitment and adherence to environmental principles. This is of particular significance where potential trading partners and clients require proof of integrity in terms of the environment. We can devise and implement an EMS for all working environments.

## **Environmental Legislation**

In line with constitutional rights to a healthy environment there is rapid change taking place in legislation. We are keeping abreast of developments and are well informed of recent and impending changes in various Acts and new legislation that impact on the work we carry out.

## **Waste Management**

The firm has extensive experience in both *landfill investigations and waste management*. Permit applications have been made for general and industrial landfills. All applications are undertaken with strict adherence to the "Minimum Requirements: Volumes 1 to 3" (Department of Water Affairs and Forestry, 1994). *EIA's* and *public participation* are of major importance to the procedure.

## **FIELDS OF GEOTECHNICAL EXPERTISE**

### **Geotechnical Investigations**

Extensive experience has been gained in all aspects of geotechnical work throughout Southern Africa, the Congo, Ethiopia, Zaire and Indonesia. Projects include *commercial, industrial and residential developments* such as *airports, bridges, waste disposal sites, cemetery sites, pipelines, railways, roads and communication towers*.

Geotechnical investigations have been completed for new roads, and the upgrading and rehabilitation of existing roads that vary from low volume gravel roads to freeways. Material investigations are an integral part of the geotechnical work whereby material sources are identified and assessments of material quality and volume are made (supervising drilling, logging core & trial pits, sampling and interpretation of laboratory results).

The identification of *problem soils* (such as *dispersive soils, collapsing sands, heaving and compressible clays*) and recommendations for engineering solutions is a significant aspect of any investigation we undertake. *Dolomite terrain* presents constraints for development, which we are able to assess and advise on.

*Slope stability analyses* form part of many projects such as road and rail embankments, waste disposal dumps and fill slopes. We are able to design slopes and give solutions in the case of failures.

More specialist work incorporates *dam and tunnel investigations, rock mass characterisation, rock support requirements, tunnel linings, pile design, lateral support for deep excavations*, and calculations for *accelerating consolidation in highly compressible clays*.

### **Geohydrology**

Geohydrological investigations have been completed for the identification of aquifers, location of boreholes for drinking water supply and for use as monitoring boreholes for mines and landfill waste disposal sites (to determine the impact of operations on groundwater). Catchment studies have been completed. Hydrological and geohydrological studies have been undertaken to determine pollution control solutions such as that for Richards Bay Coal Terminal. Geohydrological studies include the interpretation of geological setting, extensive use of geophysical methods and groundwater modelling.

## SUMMARY – TERRATEST FIELDS OF EXPERTISE

### Environmental Services

- *Environmental Impact Assessments (EIAs)*
- *Environmental Management Programme Reports (EMPRs) (for mining)*
- *Environmental Management Plans (EMPs)*
- *Environmental Management Systems (EMS)*
- *Strategic Environmental Assessments (SEAs)*
- *Spatial Development Plans*
- *Rehabilitation Plans*
- *Environmental Auditing*
- *Public Participation & Community Facilitation*

### Waste Management

- *Site Selection*
- *Landfill permitting (DWAF Minimum requirements)*
- *Closure permitting*
- *Environmental Auditing*

### Geotechnical Investigations

- *Site Investigations*
- *Field Geological Mapping*
- *Supervision, and Profiling of Trial Pits and Boreholes*
- *Geophysical Investigations*
- *Identification of Problem Soils*
- *Dolomite Investigations*
- *Sampling and Laboratory Testing*
- *Interpretation and Reporting*

### Geotechnical Design

- *Lateral Support Design*
- *Slope Stabilisation*
- *Ground Improvement Techniques*
- *Foundation Recommendations*
- *Accelerated Consolidation*

### Construction Materials

- *Identification of Borrow Pits and Rock Quarries*
- *Sampling and Testing of Materials*
- *Centre Line Surveys*
- *Stabilisation Methods for Road Layerworks*

***The firm has received the following Environmental Awards:***

- The 1997 “Bob Laburn Award” for its contribution to Environmental Awareness in Civil Engineering, specifically for the Reconstruction of Main Road 191 between Groot Drakenstein and Wemmershoek, near Franschhoek.
- The 1998 SAACE “Award for Excellence in Environmental Engineering”, awarded for the Gordon’s Bay – Rooi Els Road.

## KEY PERSONNEL

**Jan Norris** Pr.Eng., B.Eng (*Hons*) Civil, M.Sc. Geotechnical Engineering, Certificates in Integrated Environmental Management, Environmental Law and Environmental Auditing, Waste Management and Internal and Suppliers Auditor in terms of ISO 9001.

Mrs Norris has completed numerous geotechnical investigations for large and small structures including housing, industrial and infrastructure (dams, reservoirs), materials investigations for roads, slope stability assessments and monitoring of embankments (inclinometers & piezometers). Her experience includes project management and business skills (contract documentation, client liaison, rates & payments). She has completed many EMPs for projects that fall under the Mineral Act 1991, namely sand winning operations, commercial and local authority borrow pits and quarries. Involved with public participation, impact assessments and mitigation measures, rehabilitation of sites and calculation of financial provisions. All EMPs submitted have been approved by the Department of Minerals and Energy. A number of EIAs have been undertaken for a variety of projects including new service stations, bridges, new and up-graded roads, dams water supply schemes and solid waste disposal sites.

**Cecilia Canahai** Pr. Sci Nat, M.Sc. Engineering Geology, Certificates in Integrated Environmental Management, Environmental Auditing, Waste Management and Supplier and Internal Auditor in terms of ISO 9001.

Cecilia Canahai has completed numerous environmental impact assessments and management plans for large and small projects such as community water supply schemes, dams, reservoirs, etc. All these projects included identification of impacts, proposed mitigation and public participation. All EMP's and EIA's submitted by Mrs Canahai have been approved by the relevant departments. Mrs Canahai was also involved in numerous geotechnical investigations ranging from housing and industrial developments to roads, dams and tunnel investigations.

**Richard Fyvie** Pr. Sci Nat, FGS, BSc (Hons), Engineering and Environmental Geology. Currently working on MBA.

Richard has a number of years experience with *Terratest*, operating across the fields of geotechnical and environmental engineering both within South Africa and Britain. He specialises in geotechnical site investigations, slope stability assessments, materials and centreline investigations, foundation design, environmental impact assessments, basic assessment reports and environmental auditing. Richard has also working on projects in England, Scotland and Northern Ireland for the *Mouchel Group*, focusing on evaluation of abnormal development design and remediation of brownfield sites, detailed S.I.'s and Highways Agency embankment stability term contracts.

Richard has worked extensively throughout the Eastern Cape and the Nelson Mandela Metropole, notably on geotechnical evaluations for Coega Zones 1 – 5, and upgrades associated with the 2010 World Cup. Richard currently manages the *Terratest* Port Elizabeth office, based within the Greenacres Office Park in Newton Park.

**Steven Bok** BSc (Hons), Geology.

Steven joined the firm in 2002 and has been an integral part of the geotechnical and environmental divisions. He specialises in geotechnical investigations for state, commercial and private bodies, including numerous housing developments, houses, office buildings, bridges and pipelines throughout South and Southern Africa. Recent specific experience involved geotechnical investigations for the proposed Ludeke Dam, near Bizana, Eastern Cape, a weir and off-channel storage dam on the Black Umfolozi River, near Nongona, KwaZulu Natal and the Thuni Dam in eastern Botswana.

Steven's geophysical experience is often called upon for the inferral of rockhead contact and groundwater information for quarries and borrow pits, groundwater identification and bridge and dam site investigation. Geophysical methods used are p- and s -wave seismic surveys, 2D resistivity and EM-34 electromagnetic surveys. His environmental experience includes the successful completion of EIAs, BARs, Environmental Management Plans and Mining Permit Applications for a wide variety of development and mining concerns.

**Dumisani Bokveldt** Cand.Sci.Nat, B.Sc. (*Hons*), Entomology. Certificate in Environmental Impact Assessment: The NEMA Regulations- A Practical Approach.

Dumisani has recently joined us after a number of years with the *Ikamva Consulting Agency*. He specialises in Environmental and Waste Management Services. He was a project leader in a number of waste management investigations which include the following: Integrated Waste Management Plans for *OR Tambo District Municipality*, Waste Management Planning for Ukhahlamba District Municipality, Involved in the development of a new waste disposal site in Qaukeni Local Municipality, Environmental Impact Assessment investigations for new land fill sites. He was also involved in developing Integrated Waste Management Plan for *Alfred Nzo District Municipality*. Dumisani also has experience in the fields of Environmental Impact Assessment, Public Participation.

**Makhosodumo Kholisa** B.A., P.G.D. Currently working on the final requirements of M.Phil. in Environmental Management. Certificates in Environmental Law for Environmental Managers, Ecological rehabilitation and Mine closure, Implementing Environmental Management Systems in terms of SABS/ ISO 14001, Environmental Compliance Monitoring and Law Enforcement, Ecological assessment, Effective communication, Problem Solving and Decision Making, Pollution and Waste Management.

Mr Kholisa joined the firm after a number of years with the Department of Environment Affairs in both the Western and Eastern Cape. He thus has a wealth of experience in a wide range of Environmental Impact Management processes and applications, including Environmental Compliance Monitoring, Environmental Law Enforcement and Biodiversity Management. He has assisted in compiling a Provincial Environmental Implementation Plan and Annual Performance Report, as mandated by National Environmental Management Act, for the Eastern Cape Department of Environmental Affairs, and is currently Project Leader for a number of private and parastatal Environmental Impact Assessment investigations.

## RECENT PROJECTS

### *Environmental projects:*

- Honeydew Quarry audit review
- Philippi R 300 extension – environmental report
- Policy guidelines for borrow pits EMPs for DOT (KwaZulu-Natal)
- EMPs for underground coal mine (Rietvlei), opencast (nr. Hlobane) and 3 coal dumps (nr. Newcastle).
- Richards Bay Coal Terminal: comprehensive environmental audit with construction of pollution control structures
- Initial EIA for Mpendle Water Supply Scheme including 80kms of pipeline and 6 dams
- Hard rock quarry, Pietermaritzburg
- EIA for road and radar site, near De Aar
- EIA for road extension near Uitenhage
- EIA for Sentech mast, Vredendal
- EIA for new dam site in Ludeke, Eastern Cape
- EMP for hard rock quarry near Bizana
- EMP for hard rock quarry near Lusikisiki
- EIA for oxidation ponds at Bizana and Riverside
- Waste Management System for Amatola District Municipality
- Umngazi River Road – EIA
- EIA for Nelson Mandela Bay Municipality Bucket Eradication Programme

### *Geotechnical projects:*

- Hilton TLC landfill investigation and report
- Industrial landfill, Cato Ridge (aluminium waste)
- Ceres, waste management / recycling
- Radar towers, Potgietersrus and De Aar
- Bridge foundations; Franschoek, Durban Southern Gateway, Francistown, Botswana.
- Housing and industrial developments in Belville, Edendale, Frischgewaagd
- Slope stability analysis, R34 nr. Vryheid
- Sewerage ponds, Ramotswa, Botswana
- Centre line road investigation, Mochudi, Botswana
- Rock mass characterisation, De Aar
- University of Botswana, foundation investigation
- Gold prospecting, Tanzania
- Various small & medium scale housing developments
- Lateral Support design and supervision for North Coast Road
- Mimosa Road / North Coast Road Slope Stabilisation
- Stanger Road / Argyle Road bridge and abutment foundation design on “Hippo” clays

- EIA for St Albans Sewage Pipeline in Port Elizabeth
- EIA for Motherwell Canal Development in Port Elizabeth
- EIA for Infrastructure Developments in Teko Springs, Butterworth
- ECO for Olifantskop Pass Stabilisation near Paterson
- EIA for Eskom Telecommunication Tower in Jamestown

## TERRATEST CONTACT DETAILS

### Office & Address

**PIETERMARITZBURG**  
PO Box 13009  
Cascades  
3202

**DURBAN**  
PO Box 37378  
OVERPORT  
4067

**EAST LONDON**  
PO Box 19046  
Tecoma  
5214

**PORT ELIZABETH**  
PO Box 27308  
Greenacres  
6057

### Contact Numbers and Email

Tel: (033) 347 1841  
Fax: (033) 347 1845  
E-mail: [norrisj@terratest.co.za](mailto:norrisj@terratest.co.za),  
[schreinerd@terratest.co.za](mailto:schreinerd@terratest.co.za),  
[canahaic@terratest.co.za](mailto:canahaic@terratest.co.za)

Tel: (031) 275 5500  
Fax: (031) 209 4936  
E-mail: [lotzm@terratest.co.za](mailto:lotzm@terratest.co.za)

Tel: (043) 726 8424  
Fax: (043) 726 8565  
Email: [terratest-el@terratest.co.za](mailto:terratest-el@terratest.co.za)

Tel: (041) 363 4428  
Fax: (041) 363 1922  
Email: [terratest-pe@terratest.co.za](mailto:terratest-pe@terratest.co.za)

### Contact Person

Jan Norris  
Deneys Schreiner  
Cecilia Canahai

Mark Schapers  
Michelle Lotz

Tarryn Jordaan

Richard Fyvie  
Makhosi Kholisa