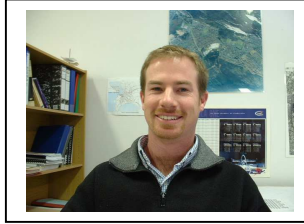


<b>Company:</b>	ARCUS GIBB
<b>Name:</b>	ANDREW BULMAN
<b>Nationality:</b>	South African
<b>Profession</b>	Transportation Engineer
<b>Position</b>	Senior Associate
<b>Date of Birth</b>	23.10.1971
<b>Specialisation</b>	Traffic Engineering, Transportation Planning, Public Transport Systems, Road and Public Transport Facility Design, Safety Studies and Audits, Transport Feasibility Studies, Project Management.
<b>Start date with ARCUS GIBB</b>	1995 to 2000 and 2002 to present. Permanent full-time staff member
<b>Experience:</b>	13 years



**Qualifications:**

- Bachelor of Science in Civil Engineering : University of Cape Town, 1994
- Master of Engineering in Transportation : University of Stellenbosch, 2001
- Professional Engineer (PrEng) . (990261)
- Professional Member of the South African Institute of Civil Engineers (091428)

**Mr. Andrew Bulman** holds a MEng in Transportation and is registered as a Professional Engineer. He is a senior Transportation Engineer with 11 years experience in the transportation and civil engineering field. He is currently the manager of ARCUS GIBB's Traffic Engineering and Transportation Planning Team in Cape Town.

Andrew specialises in the management of Transport Impact Assessments (TIA's), Public Transport Studies, Public Transport Infrastructure designs, Transport Feasibility projects and Road Design. As a specialist Transportation Engineer, Andrew has undertaken numerous transportation studies around the country, but mostly in the Western Cape Region. He has managed a wide range of projects and has been involved in the project teams of a number of high profile projects, including the Vangate Shopping Centre in Cape Town, the upgrade of the Impala Platinum Mine in Springs, the Claremont Public Transport Interchange, the development of District Six in Cape Town, the 2010 FIFA World Cup Stadium in Cape Town and the Spar Western Cape Regional Distribution Centre.

**Relevant Project Experience:**

- Project Leader – Vangate Shopping Centre Transport Impact Assessment
- Transportation Engineer – Upgrade of the Impala Platinum Mine in Springs
- Project Leader – Design and Implementation of the Claremont Public Transport Interchange
- Project Leader – District Six Transport Impact Assessment
- Transportation Engineer – Transport Framework for the 2010 FIFA World Cup Stadium in Cape Town
- Transportation Engineer – Spar Western Cape Regional Distribution Centre
- Etc.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

**PROPOSED POSITION : VISUAL IMPACT ASSESSMENT SPECIALIST**

<b>Company:</b>	BAPELA CAVE KLAPWIJK	<b>Qualifications:</b> <ul style="list-style-type: none"> <li>• Bachelor of Science in Mining Engineering: University of the Witwatersrand, 1967</li> <li>• Integrated Environmental Management - Theory and Practice : University of Cape Town, 1986</li> <li>• Certified Environmental Impact Assessment Practitioner, Interim Certification Board, 2002</li> <li>• President Institute of Landscape Architects of South Africa, 1978-1982</li> </ul> <b>Membership of Professional Institutions:</b> <ul style="list-style-type: none"> <li>• Fellow: Institute of Landscape Architects of South Africa</li> <li>• Member: International Association of Impact Assessors of South Africa</li> <li>• Member: South African Institute of Mining and Metallurgy</li> <li>• Past President of the Institute of Landscape Architects of South Africa</li> </ul>
<b>Name:</b>	ALAN CAVE	
<b>Nationality:</b>	South African	
<b>Profession</b>	Environmental Impact Assessor and Landscape Architect	
<b>Position</b>	Director	
<b>Date of Birth</b>	27.08.1945	
<b>Specialisation</b>	Integrated environmental management including environmental impact assessments, visual impact assessments and environmental management plans, landscape planning and design	
<b>Start date with BCK</b>	1989 – Director	
<b>Experience:</b>	30 years	

Alan Cave and Menno Klapwijk established the firm Cave Klapwijk and Associates in 1989 and since then he has been involved as a leader and as a specialist consultant on a number of large EIA studies. Mr Cave's experience in the gold mining field in SA and abroad (5years) reinforces his input of his chosen field of specialisation in environmental planning, assessment and landscape design. His pioneering work in Visual Impact Assessment in RSA has assisted in the understanding of this aspect as a tool for planning and design. He is a Certified Environmental Practitioner for South Africa and is a member of the Certification Board of the profession of Impact Assessors. He has gained experience in large scale internationally funded projects by acting as project leader for the environmental impact assessment for the new Letsibogo Dam in Botswana and the new N3 Toll Road in South Africa. Donors for the former included Sweden, Denmark, the UK and the EU while the latter included the African Development Bank. Both of the reports received favourable reviews.

**Relevant Project Experience:**

<b>Completion Date</b>	<b>Project description</b>	<b>Role</b>	<b>Client</b>
2005	VIA for the West Coast Combined Cycle Gas Turbine Power Plant (CGCT)	Author Menno Klapwijk	EON Solutions Africa for Eskom Resources and Strategy
2002	Visual /Guidelines for Development. Coega Industrial Development Zone (IDZ) Coega Kop Quarry Rehabilitation Guidelines	Author Author	Coega Development Corporation(CDC) CDC
2002	Pechiney Aluminium Smelter – Visual Impact Assessment Report.	Reviewer	CSIR for Pechiney
2005	Ermelo – Majuba railway line. Environmental Management Plan	Author	Eskom -Generation
2005 on going	Perseus to Hydra new 765 KVA Powerline Dealesville to De Aar Visual Impact Assessment	Author	Argus Gibb for Eskom
1992 1996	Visual Impact Assessment Alusaf Hillside Smelter and Mozal Aluminium Smelter	Author	CSIR for Alusaf CSIR for Mozal
2003	Visual Impact Assessment Wind Turbine Farm Kalkheuwel Western Cape	Author	CSIR for Eskom
2005	Visual Impact Assessment of the light penetration beyond the site of 2 new Petrol Service Stations Zwartkop & Vanderbijlpark	Author	Sivest Selatile Maloi for Sasol
2001 -ongoing	Environmental Impact Assessment Study and Environmental Management Plan for the N3 Toll Road Heidelberg to Cedara	Project Manager Author Reviewer of Environmental controls	N3 Toll Concession (Pty) Ltd.
1997	Letsibogo Dam Botswana Environmental Impact Assessment Report ,and EMP	Project Manager Author Reviewer of environmental controls	Dept of Water Affairs Botswana

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

<b>Company:</b>	Octagonal Development
<b>Name:</b>	Alewyn Bernardus Jacobus Dippenaar
<b>Nationality:</b>	South African
<b>Profession</b>	Socio- Economic Specialist
<b>Position</b>	Consultant
<b>Date of Birth</b>	19/09/1958
<b>Specialisation</b>	-Project Planning -Project management and Project Administration
<b>Experience:</b>	23 years

**Qualifications:**

- 1983 – Hons.B.Diac Social Work Unisa
- 1988 – Human Resource Management (MBL1- Unisa)
  - Legal Environment (MBL1- Unisa)
  - Organisational Behaviour (MBL1 – Unisa)

**Relevant Project Experience:**

1. **Geïntegreerde Ontwikkelingsbeplanning** vir 14 munisipaliteite in die Wes – Kaap Provinsie en tans aktiewe GOP betrokkenheid by Swartland, Hessequa en George Munisipaliteite.
2. **Prestasiebestuur** – vir die munisipaliteite van Swartland en George.
3. **Prestasiekontrakte** - vir o.a. die direkteure van George en Swartland .
4. **Publieke deelname en kommunikasie strategie** – George .
5. **Strategiese beplanning** vir die Rade en Direkteure van George en Swartland.
6. Inligtingsessies en opleiding rakende **Wykskomitee**
7. **Beleidsformulering** rakende verskeie sake o.a. behuising, omgewing, armoede, ens
8. **Strategiese beplanning** vir verskeie provinsiale departemente o.a. plaaslike owerheid, maatskaplike dienste, behuising, omgewing.
9. **Plaaslike ekonomiese strategie ontwikkeling** vir o.a. Magareng, Frances Baard , Hessequa en Swartland Munisipaliteite.
10. **Samestelling van Jaarverslae** in ooreenstemming met riglyne van nasionale tesourie.
11. **Koppeling van begrotings aan IDP** in ooreenstemming met MFMA.
12. **Betrokkenheid by samestelling van Service Delivery and Budget Implementation Plans** o.a. Hessequa, Swartland, George en Mosselbay Munisipaliteite.
13. **Publieke deelname werkwinkels** – fasiliteer ongeveer 80 publieke deelname werksessies per jaar.
14. **Opleiding** – Raadslede en wykskomitee lede rakende verskeidenheid van onderwerpe

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

<b>Company:</b>	Jongens Keet Associates	<p><b>Qualifications:</b></p> <ul style="list-style-type: none"> <li>• MSc (Electrical Engineering) University of Cape Town;</li> <li>• Department of Electrical Engineering, University of Cape Town (1971 - date) Senior Lecturer;</li> <li>• Part time professor Department of Architecture, University of the Orange Free State (1998 – 1999)</li> </ul> <p><b>Membership of Professional Institutions:</b></p> <ul style="list-style-type: none"> <li>• Engineering Council of South Africa;</li> <li>• South African Institute of Electrical Engineers;</li> <li>• Southern African Acoustics Institute (Council member 1989, 1996 – 1998);</li> <li>• Nederlands Akoestisch Genootschap;</li> </ul>
<b>Name:</b>	Adrian W.D. Jongens	
<b>Nationality:</b>	South African	
<b>Profession</b>	Acoustical Engineering Consultant	
<b>Position</b>	Associate	
<b>Date of Birth</b>	19:10:1946	
<b>Specialisation</b>	Environmental noise; Transportation noise; Industrial noise; Noise management policy formulation; Architectural & building acoustics; Acoustical properties of materials; Underwater acoustics; Electro-acoustics	
<b>Experience:</b>	35 years	

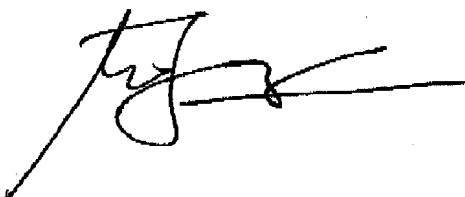
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**Adrian W.D. Jongens** provides a consulting service, backed by more than 35 years of experience, to government departments, defence institutions, local authorities, local & international industries, public and private bodies throughout Africa in all aspects relating to building & architectural acoustics, noise & vibration control, community & environmental noise, noise management policy formulation.

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**Relevant Project Experience:**

- Acoustical advisor to the City of Cape Town City Engineer's Department, on environmental & community noise and formulation of Municipal Noise By-Laws (1973 – 1985);
- Member South African Bureau of Standards (SABS) Steering Committee for Acoustics & Noise Abatement (1988 – 1993);
- Member SABS/SANS technical committee for Acoustics & Noise Abatement ( 1993 – date);
- Member Council for Scientific & Industrial Research National Calibration Service Special Technical Committee on Acoustics (1988 – 1992);
- Member International Standards Organisation, TC43 Working Group 38 (1993 – date);
- Member specialist advisory team to Cape Town Olympic Bid Committee (1996 – 1997);
- Author and co-author of more than 40 research publications;
- Convenor of Southern African Acoustics Institute Symposia (1995 and 1997);
- Acoustical advisor to Stanway Edwards Ngomane Associates (Pty) Ltd., Pretoria (1991-2000);
- Reviewer of numerous specialist reports.



Signature: \_\_\_\_\_

Date: \_\_\_\_\_

## PROPOSED POSITION : BOTANICAL SPECIALIST

<b>Company:</b>	COASTEK
<b>Name:</b>	BARRIE LOW
<b>Nationality:</b>	South African
<b>Profession</b>	Plant ecologist and conservation planner
<b>Position</b>	Owner
<b>Date of Birth</b>	21.2.52
<b>Specialisation</b>	Botanical and ecological assessment of both dryland (terrestrial) and riverine/wetland ecosystems; contextual analysis; conservation prioritisation; conservation network planning and corridor ecological implementation; environmental impact assessment; rehabilitation studies
<b>Start date with Coastec</b>	1997
<b>Experience:</b>	30 years

### Qualifications and positions:

- Bachelor of Science in Botany and Zoology : University of Cape Town, 1973/4
- Bachelor of Science (Honours) in Botany : University of Cape Town, 1975
- Master of Science in Botany (Plant Ecology) : University of Cape Town, 1984
- Stellenbosch School of Business business course – 1995
- Past Director: National Botanical Institute (1991 – 1997)
- Past senior lecture at Botany Department, University of Western Cape (1978 – 1991)

### Membership of Professional Institutions:

- Professional Member, South African Institute of Ecologists and Environmental Scientists
- Past Board member and Director, Cape West Coast Biosphere Reserve
- Past Chairman of Western Cape Branch of Wildlife Society
- Past Council Member of the Botanical Society of SA
- Past Chairman of Conservation Committee, South Africa Association of Botanists

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**Mr. Barrie Low** holds a M.Sc. in Plant Ecology. He is owner and sole proprietor of Coastec, with 30 years in the botanical and environmental assessment fields. Barrie specialises in botanical and ecological assessments in dryland (terrestrial), riverine and wetland systems, with strong focus on coastal dune and related systems. Due to scale limitations in current approaches to conservation assessments, a key focus has been the determination of site distinctiveness and rarity using flora as a surrogate for habitat; to this end Coastec has developed SaSFlora, a major regional database for the Cape and Karoo floras, for such analysis. This approach is linked with ArcView mapping and analysis of ecosystems. Coastec specialises in developing conservation plans, in particular for areas which have been severely impacted by urban and allied development. Part of this approach is the implementation of ecological corridors linking remnants and riverine/wetland systems

Studies include the Northern Sandveld rivers reserve and ecological impact study, conservation assessments and planning for the Witzenberg Municipality and Cape Winelands District Management Area, with coastal contextual studies including the Laaiplek (Elandsbaai to Saldanha) Coast), Hawston (Agulhas to Kogelberg) areas and coastal dunes of the City of Cape Town, Koeberg and the Portnet ore-loading facility at Saldanha..

Barrie is a past director at the National Botanical Institute (now SANBI), past Director on the board of the Cape West Cost Biosphere, and past chairman of the Western Cape Branch of the Wildlife Society, and Council member of the Botanical Society of SA

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### Relevant Project Experience:

- Project specialist – Laaiplek subregional dune study
- Project specialist – Cape Winelands District Management Area conservation assessment
- Project specialist and leader – City of Cape Town coastal dunes study
- Project leader – Hawston fynbos corridor and conservation planning study

CV for the learner can only be supplied once the project go-ahead is given and a learner can be sourced from UWC (in liaison with Dr Richard Knight of the Conservation Biology department)

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

<b>Company:</b>	ACER (Africa)	<p><b>Qualifications:</b></p> <p>1994 – 1998: University of Zululand BSc (Majors – Ecology and Microbiology)</p> <p><b>Membership of Professional Institutions:</b></p> <ul style="list-style-type: none"> <li>International Association for Impact Assessment (South African Chapter)</li> </ul>
<b>Name:</b>	BONGI SHINGA	
<b>Nationality:</b>	South African	
<b>Profession</b>	Environmental Consultant	
<b>Position</b>	Director	
<b>Date of Birth</b>	21.01.1975	
<b>Specialisation</b>	Public Involvement	
<b>Start date with ACER (Africa)</b>	1 January 2000	
<b>Experience:</b>	6 years	

**Ms. Bongi Shinga:** a Shareholder of ACER, holds a BSc degree with majors in Microbiology and Ecology. Her project work on the Thukela Water Project Decision Support Phase, the establishment of a Catchment Management Agency for the Thukela Water Management Area and her role in the development of a Water Licensing Toolkit, has established Bongi with an impeccable reputation in the application of the principles and practices of the National Water Act in South Africa.

Bongi has also excelled in the field of public participation. She has gained a reputation for excellence and diligence with many clients, especially Eskom. Bongi has managed and undertaken public participation as part of environmental impact assessments for the following recent large, linear projects: Eros-Neptune-Grassridge Transmission Line (KwaZulu-Natal and Eastern Cape), the Braamhoek Pumped Storage Scheme (KwaZulu-Natal and Free State) and the Hydra-Perseus 765 kV Transmission Line (Free State and Northern Cape). She is currently project manage public participation for the Gamma-Grassridge EIA for Eskom. These projects have involved communication, liaison and facilitation across a wide spectrum of sectors, including, communities, government departments, farmers, businesses and nature conservation organisations. Bongi is well-versed in the requirements of public participation as applied in environmental assessments in South and Southern Africa.

**Relevant Project Experience:**

- 2005 - 2006** Department: Water and Forestry. Water Conservation and Water Demand Management Potential Assessment: Mokolo River Catchment. Stakeholder Participation and KAP Survey.
- 2005 - 2006** Eskom Transmission. Proposed construction of a 765kV Transmission Power Line from Dealesville (Free State) to De Aar (Northern Cape). Environmental Impact Assessment: Public Participation Consultant
- 2004 – 2005** Eskom Transmission. Braamhoek Transmission Power Line & Sub-Station Integration for the Braamhoek Pumped Storage Scheme. Public Participation Consultant.
- 2003 – 2004** Department for International Development and Department: Water and Forestry. Developing a Toolkit for Water Use Allocation Planning. Communication, Community Participation, Rural Community Upliftment.
- 2004** European Union. Support to Wild Coast Spatial Development Initiatives. Communication and Stakeholder Facilitation Aspect for the Mbizana and Qaukeni Conservation Development Initiatives.
- 2004** Mhlathuze Water. Water Conservation Awareness Program. Planning and Facilitation.
- 2004** Department: Water and Forestry. Integrated Water Resource Management: Mining. Stakeholder Consultation.

Signature:



Date: 05 June 2006

**Prof. Charles Griffiths**  
Abbreviated CV (July 2008)

Charles Griffiths was born in Kenya and educated at Blundell's Public School in Devon, UK, before proceeding to Southampton University (UK), where he was awarded a BSc (Hons), followed by a PhD from the University of Cape Town. He has been a member of the University of Cape Town staff since 1970 (age 22), rising through the ranks to full professor in 2007. He has been married to Dr Roberta Griffiths since 1974 and they have two adult children, Melinda (b 1980) and Matthew (b 1986)

His main current research interests are the documentation of marine biodiversity and the impacts of marine invasive alien species. He is author of papers describing over 100 species new to science and of four guide books on South African fauna, including the two best-selling field guides: 'Two Oceans – a Guide to the Marine Life of South Africa' (now in its 6<sup>th</sup> printing) and 'Field Guide to the Insects of South Africa' (now in its 5<sup>rd</sup> printing). He has published nine other book chapters, 126 research articles and 40 semi-popular scientific articles. He is author of 120 conference presentations and has convened four conferences. Thirty-three MSc and 15 PhD students have graduated under his supervision, with a further five MSc and six PhD students currently under supervision. He is a recipient of the UCT book award 1994, is a Life Fellow of the University of Cape Town, a Team Member of the DST/NRF Centre of Excellence in Invasion Biology and winner of the Gold Medal of the Zoological Society of South Africa for 2006. He is also editor of the journal *African Zoology* and a member of the editorial boards of the journals *Marine Biology*, *Koedoe*, *Smithiana* and *African Natural History*. In his spare time he is a serious natural history photographer and some 2000 of his images have been published in a wide variety of textbooks, magazines, advertisements and calendars.

## CURRICULUM VITAE

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Company Name	Arcus GIBB
Name	<b>Christopher Malcolm WIID</b>
Nationality	South African
Date of Birth	02.01.1953
Profession	Civil and Environmental Engineer
Position	Contracted Specialist
Current Specialisation	Integrated Waste Management Planning and project implementation, landfill site design, planning, contract administration and site
Start date with Arcus GIBB	1999 to Feb 2009 - Permanent full-time staff member March 2009 - Contract

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### Key experience

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A civil engineer with 29 years of experience, Christopher Wiid has worked in the sphere of roadworks and infrastructure both in the consulting and contracting fields. He has diversified into the environmental sphere with a specialisation in waste management, landfill design and associated project management. The remediation of contaminated land is an area in which he has also become involved.

His engineering experience and grounding, has enabled him to successfully plan and implement waste management projects, by integrating both conventional engineering principles and approaches, with the various sciences in waste management and the environmental field. He is a team player, accustomed to working closely with practitioners from other disciplines in the field.

The planning of solid waste disposal sites is a speciality. This involves the assessment of the suitability of sites, based on an exhaustive list of criteria. Other tasks would be the assessment of airspace requirements as informed by waste quantities and types, available resources and available site space. Budget estimation and projection is also a critical factor

Working trip to UK, USA and Italy (1997) to meet high profile roleplayers in the waste industry, visit geomembrane and geosynthetic clay, liner manufacturers, research institutions and landfill sites

His key experience includes:

- **Design, documentation, planning contract administration, site supervision and project management** of general and hazardous landfill sites
- **Contract administration, design, documentation and site supervision** of contaminated land rehabilitation projects
- **Integrated Waste Management planning and project implementation**
- **Planning and documentation** of civil engineering projects
- **Design, contract administration, project management and community liaison** of trunk road construction and rehabilitation projects (consultant and contractor)
- **Office management** (including marketing, client liaison, administration, mentorship, staff training)



## C WIID C V SHEET 2

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### Qualifications

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National Diploma for Technicians (Civil Engineering) : Cape Technikon, 1975  
Bachelor of Engineering (Civil) : University of Cape Town, 1982  
Diploma in Project Management : Executive Education, Durban, 1989  
Registration as a Professional Engineer : Engineering Council of South Africa, 1993  
PrEng Registration No : 930549  
Member of the Institute of Waste Management  
Past secretary of the KwaZulu-Natal Landfill Interest Group  
Committee Member of the Western Cape Landfill Interest (treasurer)  
Committee Member of the Western Cape Branch of the South African Institute of Waste Management

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## C WIID C V SHEET 3

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### Career summary

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March 2009 to date **Arcus GIBB** – Contracted Specialist

Projects and responsibilities included:

- Pikitup (Pty)ltd: Disposal site development planning R 500 000
  - Assessments of waste quantities
  - Assessments of airspace requirements and capacity for 4 disposal sites
  - Planning for necessary expansions to 4 disposal sites
- East London IDZ: Waste Collection and Sorting Facility R 25 million
  - Planning and design review for a solid waste transfer station for the East London Industrial Development (collection of waste and sorting for recycling)
  - Assessments of waste quantities
  - Contract Management and Project Management
- Greater Port Harcourt City Development Authority, Rivers State, Nigeria: Waste Management facility design and planning
  - Assessments of waste quantities
  - Assessments of airspace requirements and capacity for new disposal site
  - Planning for necessary expansions to 4 disposal sites
  - Development planning, client liaison and design for new regional disposal site, Drop Off Centres and Buy Back Centres

1999 to 2009 **Arcus GIBB** – Associate

Projects and responsibilities included:

- City of Cape Town: Vissershok Class H:h waste disposal site Planning, client liaison, design, documentation, contract administration, site supervision, project management:
  - Assessments of waste quantities
  - Assessments of airspace requirements and capacity for new waste cells
  - Disposal cell 1, R10 million
  - Disposal cell 2, R12 million
  - Disposal cell 3, R 19 million
  - Disposal cell 4, R 14 million
  - Closure capping, R0.5 million
  - Leachate treatment plant, value R5 million
- City of Cape Town: Vissershok ClassH:h waste disposal site, Planning and Permit application:
  - Assessments of waste quantities
  - Assessments of airspace requirements and capacity for new disposal site

## C WIID C V SHEET 4

- Overstrand Municipality: Karwyderskraal Class G solid waste disposal site  
Planning, client liaison, design, documentation:
  - Disposal cell, value R10 million
  - Operation of site, value R1 million (contract documentation and tender)
- Overstrand Municipality: Kleinmond and Hermanus Solid Waste Transfer Stations
  - Operation of Transfer Stations (contract documentation and tender), value R2 million
  - Haulage of waste (contract documentation and tender), value R1 million
- Buffalo City Municipality : Roundhill Regional Solid Waste Disposal Site  
Planning, client liaison, design, documentation, contract administration, site supervision, project management:
  - Disposal cell 1, value R7 million
  - Disposal cell 2, value R8 million
  - Technical support and review
- Buffalo City Municipality: Cambridge Solid Waste Transfer Station  
Planning, client liaison, design, documentation:
  - Cambridge Transfer Station
- Barlow World: Thesen Islands Remediation:  
Planning, client liaison, design, documentation, contract administration, site supervision, project management:
  - Remediation and closure (including contaminated land rehabilitation and composting of wood waste), value R9 million
- Oudshoorn Municipality
  - Development planning, client liaison and design for new disposal site
  - Site selection and permitting
  - Waste minimisation initiatives
  - Operations Document and contract administration for existing disposal site
- Amatola District Municipality: Ducats disposal site
  - Design of landfill site capping and closure
- National Cleaner Production Centre: Feasibility Study
  - Feasibility study : fabric waste recycling in the clothing and textile industry
- Heartland Properties: Paardevlei Earthworks
  - Earthworks to vlei and platform
  - Liaison with multidisciplinary design team (architects, planners, specialists)
- Overstrand Municipality: Gansbaai Disposal Site

## **C WIID C V SHEET 5**

- Development planning, client liaison and design for new disposal site
- Design of Cell 1 and infrastructure, value R5.5 million
  
- Drakenstein Municipality: Paarl disposal site
  - Monitoring of rehabilitated landfill (co-ordination and participation on monitoring team for groundwater and landfill gas)
  
- City of Cape Town: Waste categorization study
  - Planning, fieldwork and reporting for a Waste Categorisation study
  - Examination of waste stream, categorization and analysis
  
- Mandeni Municipality: Integrated Waste Management Plan
  - Compilation of and Integrated Waste Management Plan
  - Compilation of waste collection contract document, tender process and adjudication
  
- Ekurhuleni Metropolitan Municipality: Disposal site selection
  - Disposal site selection involving negative mapping, site visits, public participation and reporting
  
- Beaufort West Municipality: Disposal site permit application
  - Disposal sites (2) permit application, fieldwork and reporting
  
- General
  - General office matters involving compilation of proposals, submission of tenders, project financial management, mentoring & training, office administration.

## C WIID C V SHEET 6

1991 to 1999 **AA Loudon & Partners (consulting civil engineers)** - Associate Partner

Contract administration, planning, site supervision, project management, design, client liaison for various general and hazardous landfill sites:

- Phases 1B and 2A of Bulbul Drive Class H:h Landfill, Waste Services (Pty) Ltd, value 7 million
- Inanda Class G Landfill, Durban Solid Waste – R1.7 million
- Phases 4, 5, 6 and 7 of New England Road Class G Landfill, Pietermaritzburg TLC – value R3.6 million
- Cell 2 of Mariannahill Class G Landfill, Durban Solid Waste – R5 million
- Access road and building for Ixopo General Waste Incinerator, Ixopo TLC – value R1.2 million
- Contaminated site rehabilitation at Dundee Road Products, Colas – value R0.7 million

Contract administration, site supervision and community liaison under secondment to BKS Inc

- Rehabilitation of Bus routes in KwaMashu and Ntuzuma Townships involving deep milling and conventional methods, Department of Local Government and Housing – value R6.5 million

Contract administration, site supervision, project management, client and community Liaison

- Low-cost road rehabilitation, KwaZulu-Natal Department of Works – R2 million
- Rural road and drainage rehabilitation, KwaZulu-Natal Department of Works – value R9.2 million
- Tribal road upgrading using labour intensive methods, KwaZulu-Natal Department of Works – value R0.5 million

General administration including marketing, student and staff training, office Administration

1988 to 1991 **Bewloc (Pty) Ltd (Civil Engineering Contractors)** – Contracts Manager and Director

Contracts management, submission of tenders and supervision of road rehabilitation and bituminous surfacing projects

- National Route past Mkuze – National Transport Commission
- Annual trunk road rehabilitation contracts – Natal Provincial Administration

1986 to 1988 **Ninham Shand Incorporation (Consulting Civil Engineers)** - Civil Engineering

- Technician, assistant resident engineer
- Geometric design, drainage design, site supervision
- Trunk road between Mount Fletcher and Kinira Poort – Transkei Department of Works & Energy – value R7 million

1982 to 1986 **Fulltime study and vacation work as Technician**

BSc Civil Engineering at University of Cape Town sponsored by Ninham Shand

Projects included:

- Inspection and inventory of major roads in the Transkei

## C WIID C V SHEET 7

- Geometric design on National Route between Worcester and De Doorns
- Clerk of works at New Groote Schuur Hospital
- Assistant residential engineer on overlay of DF Malan Airport

1981 to 1982 **Ninham Shand Inc (Consulting Civil Engineers)** - Civil Engineering Technician

Geometric design and drainage on trunk roads

1975 to 1981 **Clifford Harris (Pty) Ltd (Civil Engineering Contractors)** - Technician, Assistant Site Agent

Site supervision, measurement, and administration

- Cape Provincial Administration : trunk road
  - From Barkly East to Elliot
  - From Port Alfred to lovers Twist
  - From Ben Schoeman Airport to Kidds Beach
- Lohatla Military Base – roads, services, sports fields for the Department of Public Works

1973 to 1975 **Fulltime study**

National Diploma for Technicians (Civil Engineering) at the Cape Technikon sponsored by Clifford Harris (Pty) Ltd

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### Publications

Co-authored Poster Paper at Wastecon '98 entitled "Some aspects of the design and construction of landfills on slopes"

Co-authored a paper presented at the 12<sup>th</sup> Annual SAICE Congress in July 2001 "Redevelopment of contaminated land at Thesen Island Knysna". Environmental Planning: An Engineered Remediation – Dr J McStay, Mr S Doel, Mr C Wiid"

Authorised and presented two Papers at Biennial Conference, Wastecon 2000

- Waste disposal – who carries the can? A discussion of responsibility and accountability in the waste industry
- Geomembrane liners – examples of the pitfalls associated with their specification quality assurance and installation – a case study

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### Language capability

	<b>Speaking</b>	<b>Reading</b>	<b>Writing</b>
English	Excellent	Excellent	Excellent

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**Signature**

**Date**

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# GAVIN GRANT MAASDORP

**1. Nationality:** South African

**2. Date & Place of Birth:** 5 December 1937, Graaff-Reinet, Cape Province.

**3. Marital Status:** Married.

**4. Degrees:** M.Com., Ph.D., (Natal).

Title of doctoral dissertation: "Transportation and Economic Development in a Small Peripheral Country - a Case Study of Swaziland".

## **5. Present position:**

Director, Imani Development International Ltd., Mauritius,  
2006-.

Director, Imani Development (SA) (Pty) Ltd., Durban, 1997-

Director, Imani-TMT Transport Consultants (Pty) Ltd.,  
Durban, 2002-

Emeritus Professor, University of Natal, 1998-

## **6. Employment record:** Economic Research Unit, University of Natal, Durban:

(a) Research Fellow 1964-69;

(b) Senior Research Fellow 1969-75;

(c) Associate Professor 1976-81;

(d) Professor and Director, 1982-97.

Mobil Oil (SA) (Pty) Ltd, Durban, 1961-64 (last position held:  
Assistant Branch Credit Manager).

Consolidated Stevedoring and Forwarding Agency SA) (Pty)  
Ltd,

Durban 1958-61 (last position held: Assistant Accountant).

## **7. Membership of Societies**

Economic Society of South Africa.

Economic History Society of Southern Africa.

Chartered Institute of Transport and Logistics

## **8. Relevant Project Experience**

In the following list of projects, have acted as team leader (negotiating the project with the client, interviewing firms and ministries, undertaking cost-benefit analyses, undertaking supporting economic analysis, liaising with engineers and other members of study teams, and editing final reports) or as sole consultant or as sub-consultant.

**1964-66:** Socio-economic studies in the Tongaat-Verulam Region (including survey of Indian Cane Growers) (for Tongaat Sugar Company).

**1969-1971:** Team leader, Swaziland Transportation Study (road feasibility studies, rail link feasibility studies and airport feasibility study) for the Second National Development Plan (for the Ministry of Works, Power and Communications).

**1975:** Prepared paper on Economic Aspects of the Division of the Cane Crop between Millers and Growers (for the Swaziland Cane Growers' Association).

**1976-1977:** Team leader, Feasibility Studies of Road Development for the Third National Development Plan (for the Ministry of Works, Power and Communications).

**1981-1982:** Team leader, Feasibility Studies of Road Development for the Fourth National Development Plan (for the Ministry of Works, Power and Communications).

**1982:** Team leader, Feasibility Study of Alternative Tarred Routes Between the Manzini-Siteki Road and the Northern Sugar Area (for Swaziland National Trust Commission and Ministry of Works, Power and Communications).

**1987:** Team leader, Feasibility Studies of Road Development for the Fifth National Development Plan (for the Ministry of Works and Communications).

**1991:** Economist, Pre-feasibility Study of Mutale River Pumped Storage Scheme (for VKE and Development Bank of Southern Africa).

**1992:** Lead economist, Pre-feasibility Study of Pongolapoort Dam-Lavumisa Irrigation Project, Swaziland (for Murray Biesenbach and Badenhorst and Governments of South Africa and Swaziland).

**1992:** Economic consultant in team of ZMCK Ltd., Lusaka, Feasibility Study of Mongu-Kalabo Road (for Government of Zambia).

**1992:** Feasibility Study of Mongu-Kalabo Road (for Government of Zambia).

**1992:** Feasibility study of Lavumisa irrigation scheme (for Swaziland Ministry of Agriculture).

**1993-94:** Team leader, Feasibility Study of Rail Spurs to the Sugar Mills at Big Bend, Mhlume and Simunye, and an Alternative Link between Mpaka and Mlawula (for Swaziland Sugar Association and Swaziland Railway).

**1996:** Prepared paper on "A Marketing Strategy for 1997/98-2001/02" (for the Swaziland Sugar Association).

**1998:** Professional consultant, Feasibility Study of Swaziland-Lothair rail link (for the Swaziland Railway, funded by the British Department for International Development).

**1998-99:** Team Member and Editor, study of Environmentally Sustainable Resource Development in the Maluti District of the Eastern Cape (for Nathan Associates, funded by USAID).

**1999:** Project leader, study on Agriculture and the new Trade Agenda of the WTO 2000 Negotiations – Interests and Concerns of the SADC Countries (for the World Bank).

**1999-2001:** Specialist economist, Project Management Team, Thukela Water Project Feasibility Study (for the Department of Water Affairs and Forestry, Pretoria).

**2000:** Team leader, Transport and Economic Development Study of the Coast-to-Coast Corridor (Maputo-Walvis Bay) (for the South African Department of Trade and Industry/Development Bank of Southern Africa).

**2000:** Team member, Pre-feasibility Study of an International Cargo Airport at Welkom (for Free State Goldfields Development Foundation).

**2000:** Team Leader, Study on Socio-economic Role of the South African Sugar Industry (for South African Sugar Association).

**2001:** Economist, Malawi Transport Sector Review (for ADB).



**2002:** Team member, Traffic and Revenue Forecasts 2002-19, Nacala Corridor Port and Railways (for Nedcor Investment Bank).

**2002:** Team leader, Report on Transport Logistics and Infrastructure Framework, Nacala Development Corridor (for Development Bank of Southern Africa).

**2003:** Joint Team Leader, Walvis Bay Corridor Project (for SADC).

**2003:** The Rebuilding of the Rivirivi Railway Bridge – A Financial and Economic Appraisal (for Department of International Development, UK).

**2004:** Overview of Economic Benefits Accruing from the Operation of a Seamless Nacala Development Corridor (for Development Bank of Southern Africa).

**2004:** Issues of Concern in the Southern African Sugar Trade (for the Programme Management Unit: Regional Trade Facilitation Programme).

**2005:** Economic Impact of the Otavi-Tsumeb Road (for VKE Namibia).

**2005-06:** Team leader, Transport Strategy for the Mtwara Development Corridor – Anchor mine-rail-port project (for the DBSA).

**2006:** Economic and Financial Report – Upgrading of Airports in Kenya (for Netherlands Airport Consultants BV/Stewart Scott International, funded by World Bank).

# FORMAT OF CURRICULUM VITAE

## 1. BIOGRAPHICAL SKETCH

### 1.1 GENERAL INFORMATION

<b>Surname</b>	Rautenbach									
<b>First names</b>	Cornelis Johannes de Wet			<b>ID Number</b>	6305035119087					
<b>Citizenship</b>	South African			<b>Title</b>	Prof	<b>Female</b>	<input type="checkbox"/>	<b>Male</b>	<input checked="" type="checkbox"/>	
<b>Place of birth</b>	Petrus Steyn, Free State, South Africa			<b>Date of birth</b>	3 May 1963					
<b>Population group</b>	<b>African</b>	<input type="checkbox"/>	<b>Coloured</b>	<input type="checkbox"/>	<b>Indian</b>	<input type="checkbox"/>	<b>White</b>	<input checked="" type="checkbox"/>	<b>Other (Please specify)</b>	None
<b>Department</b>	Geography, Geoinformatics and Meteorology			<b>Position</b>	Associate Professor					
<b>Direct Telephone</b>	+ 27 12 420 2173			<b>Direct Telefax</b>	+ 27 12 420 3284					
<b>E-mail</b>	<a href="mailto:hannes.rautenbach@up.ac.za">hannes.rautenbach@up.ac.za</a>									
<b>Date of appointment</b>	1 September 1991			<b>Permanent full-time</b>	<input checked="" type="checkbox"/>	<b>Temporary full-time</b>	<input type="checkbox"/>			

### 1.2 ACADEMIC QUALIFICATIONS OBTAINED

Degree/ Diploma	Field of study	Higher education institution	Year	Distinctions
BSc Meteorology	Meteorology	University of Pretoria	1986	-
BSc(Hons) Meteorology	Meteorology	University of Pretoria	1992	-
PhD	Meteorology	University of Pretoria	1999	-

### 1.3 WORK EXPERIENCE TO DATE

Name of employer	Capacity and/or type of work	Period From mm//yy to mm//yy
South African Weather Bureau Department of Environmental Affairs	<b>Highest Position:</b> Senior Meteorologist Research in Climate Variability Research in Atmospheric Modelling Computer Programming (FORTRAN and BASIC) Maintenance of climate data bank Issuing of climate data to the public Observer at Irene Weather Office (1 month : 1988) Head of the Grootfontein Airport Weather Office: (3 months: 1989) Responsible for surface data	January 1988 to August 1991

	<p>collection, upper air soundings and for issuing aviation forecasts - involved in United Nations (UN) activities during independence of Namibia.</p> <p><b>Head of the Walvis Bay Airport Weather Office:</b> (3 months: 1990) Responsible for surface data collection, upper air soundings and for issuing aviation forecasts</p> <p>Teaching as part time lecturer in undergraduate courses at the University of Pretoria</p>	
University of Pretoria	<p><b>Highest Position:</b> Head of Department Geography, Geoinformatics and Meteorology (since April 2006) &amp; Associate Professor</p> <p><b>Acting Head of the Department Geography, Geoinformatics and Meteorology</b> (November 2005 to March 2006)</p> <p><b>Management of the Meteorology Group</b> (since March 2000)</p> <p><b>Training of Meteorologists</b> (UP is the only national University that trains Meteorologists for the South African Weather Service):  BSc Meteorology  BSc(Hons) Meteorology  MSc &amp; PhD (supervising)</p> <p><b>Presenting courses in other Departments or Faculties:</b> Agriculture, Geology, Geography and Centre for Environmental Studies</p> <p><b>Development of new courses and the overall management in upgrading/changing Meteorology courses</b></p> <p><b>Research leader in many weather related research projects</b></p> <p><b>Community service</b></p> <p><b>Organising a number of Seminars, Workshops and Conferences</b> (national and international)</p>	September 1991 to present

## 2. TEACHING ACTIVITIES

2.1 Courses presented		
Course	Level (e.g. second year, Masters)	Self developed (Yes or No)
WKD 151 (Atmospheric Processes)	First year	Yes (telematic or web based)
WKD 152 (Atmospheric Circulation)	First year	Yes (telematic or web based)
WKD 161 (Physical and Mesoscale Met)	First year	Yes (telematic or web based)
WKD 162 (Dynamic and Numeric. Met)	First year	Yes (telematic or web based)
WKD 262 (Climate Data Manipulation)	Second year	Yes
WKD 351 (Atmospheric Balance Laws)	Third Year	No (notes from text books)
LKM 262 (Agriculture Climate)	Second year	Yes
AQM 810 (Air Quality Management)	Masters	No (notes from text books)
MSc & PhD supervision	Masters and Doctoral	Supervising

2.2 Other education and pedagogic courses presented		
Course	Year	Institution
None	None	None

### 3 TEACHING OUTPUTS

#### 3.1 Educational publications and products

**Telematic training:**

Prepared detailed study manuals for the courses WKD 151, WKD 152, WKD 161 and WKD 162 (4 x seven week modules). These manuals are available in either hard copies or on the web (UP telematic courses).

**Telematic training:**

Developed and published all lecture material, tutorials and project material of the courses WKD 151, WKD 152, WKD 161 and WKD 162 (4 x seven week modules) on the web (UP telematic courses).

### 4. OTHER TEACHING CONTRIBUTIONS

#### 4.1 Membership of national and international bodies

None

#### 4.2 Visits to local and overseas universities as guest professor or lecturer in regard to teaching

**UNISA:** MSc supervisor (2003 to 2005)

**University of Johannesburg:** lectures in atmospheric circulation - air pollution (2006 to present)

**WITS:** Appointed as School external examiner for the period 2009-2011 for Geography in the School of School of Geography, Arch. & Enviro. Studies at the University of the Witwatersrand (WITS)

#### 4.3 Participation in national and international teaching associations, bodies, committees

None

### 5 RESEARCH ACTIVITIES

#### 5.1 Former supervision or co-supervision (*completed*)

Name of student	Degree/Title of dissertation/ thesis and date	Supervisor	Co-supervisor(s)	Duration of studies
Mr Engelbrecht F.A.	MSc (Meteorology) with distinction: Regional climate modeling over southern Africa with a semi-Lagrangian limited area model. <i>1 international external examiner (graduated in 2001)</i>	Prof C.J.deW. Rautenbach	None	Two years

Ms Bartman A.G.	MSc (Meteorology) with distinction: Pattern analysis and downscaling of a perfectly forced general circulation model. <i>2 international external examiners (graduated in 2002)</i>	Prof C.J.deW. Rautenbach	Prof W.A. Landman	Two years
Mr Esterhuysen D.	MSc (Meteorology): Establishment of the South African baseline surface radiation network station at De Aar <i>1 international external examiner (graduated in 2004)</i>	Prof C.J.deW. Rautenbach	None	Four years
Ms McBride C.	MSc(Science Education): The effect of USA-based meteorological workshops on the self-image and professional practice of South African teachers <i>(graduated in 2004)</i>	Prof J Rogan	Prof C.J.deW. Rautenbach	Three years
Ms Bhimsan R.	MSc(Environment and Society): Implications of the new Air Quality Bill on the management of H <sub>2</sub> S emissions from SASOL's operations in Secunda, South Africa. <i>(graduated in 2005)</i>	Prof C.J.deW. Rautenbach	None	Two years
Mr Stewart P.L.C.F.	MTech (Nature Conservation) UNISA: Impacts of climate-change scenarios on biodiversity of the top end of the Northern Territory of Australia. <i>1 international external examiner (graduated in 2005)</i>	Prof C.J.deW. Rautenbach	Prof L.R. Brown	Three years
Mr Beraki A.F.	MSc(Meteorology) with distinction: Climate change scenario simulations over Eritrea by using a fine resolution limited area climate model: Temperature and moisture sensitivity. <i>1 international external examiner (graduated in 2005)</i>	Prof C.J.deW. Rautenbach	None	Two years
Mr Peral I.H.	MSc (Environment and Society): Evaluation of the ambient air quality analysis of HCl, H <sub>2</sub> S and NH <sub>3</sub> from enhanced evaporation spray system ponds. <i>(to graduate in 2006)</i>	Prof C.J.deW. Rautenbach	None	Two years

## 5.2 Current post-graduate students

Name of student	Degree enrolled for / date of first registration	Project title	Supervisor	Co-supervisor(s)	Year of registration
Mr Engelbrecht F.A. (Francois) <a href="mailto:francois.engelbrecht@up.ac.za">francois.engelbrecht@up.ac.za</a>	PhD (2001)	Theory and application of quasi-elastic equations in terrain-following coordinates based on the full pressure field	Prof C.J.deW. Rautenbach	Dr J.L. McGregor	6 <sup>th</sup> year
Botai O.J. (Joel) <a href="mailto:joel@hartrao.ac.za">joel@hartrao.ac.za</a>	PhD (2006)	Determining regional atmospheric structure and dynamics using	Prof C.J.deW. Rautenbach	Dr W.L. Combrinck	1 <sup>st</sup> year

		Geodetic VLBI and other alternative Space Geodetic techniques			
Mr Oluseun I. (Idowu) 006 08:20:26 +0000 <a href="mailto:oluseun_idowu@yahoo.com">oluseun_idowu@yahoo.com</a>	MSc (2006)	Numerical Weather predictions over Kenya using the UK African Limited Area model.	Prof C.J.deW. Rautenbach	-	1 <sup>st</sup> year
Marx E. (Estelle) <a href="mailto:estellep@weathersa.co.za">estellep@weathersa.co.za</a>	MSc (2004)	The Use of Artificial Neural Networks to enhance Numerical Weather Prediction Model Forecasts.	Prof C.J.deW. Rautenbach	Dr W Tennant	3 <sup>rd</sup> year
Mr Ndarana T. (Thando) <a href="mailto:thando@weathersa.co.za">thando@weathersa.co.za</a>	MSc (2005)	The impact of regional observations on the analysis and computer forecasts over South Africa	Prof C.J.deW. Rautenbach	-	2 <sup>nd</sup>
Ms Thomas R. (Renee) <a href="mailto:reneeet@airshed.co.za">reneeet@airshed.co.za</a>	MSc(2005)	A high resolution diagnostic wind field model for mesoscale air pollution forecasting	Prof C.J.deW. Rautenbach	-	2 <sup>nd</sup>
Ms Engelbrecht C. (Christien) <a href="mailto:s94054292@tuks.co.za">s94054292@tuks.co.za</a>	MSc (2005)	Short-range weather forecasting over southern Africa with the C-CAM atmospheric model.	Prof C.J.deW. Rautenbach	-	2 <sup>nd</sup>

<b>5.3 Obtaining research funds (Optional)</b>				
<b>Origin of research funds (e.g. contract research, THRIP, international funding organisations, other(s))</b>	<b>Title of research project or programme</b>	<b>Duration</b>	<b>Money allocated (R) (Optional - exact amounts not required)</b>	
Water Research Commission (WRC) CLIPWATER project	<i>Project Leader: Prof C.J.deW. Rautenbach</i> Seasonal climate predictions with a coupled atmosphere-ocean general circulation model: a contribution to water research management over southern Africa	1998 - 2002	R 300 000	
Department of Arts, Culture and Technology (DACST)	<i>Consortium leader with the University of Cape Town (Prof B Hewitson):</i> Seasonal weather forecasting for Agricultural, Water and Fisheries Impact planning through innovative computing.	2001 - 2003	R 150 000	
Water Research Commission (WRC) and SANPAD	<i>Consortium leader with the Universities of the North and UNISA (Prof J Olivier):</i> Implementation of a operational prototype fog water collection system	2000 - 2003	R 50 000	
Research Development Program (RDP) at UP	<i>Project leader: Prof C.J.deW. Rautenbach</i> The ability of a limited area atmospheric circulation model to simulate climate, seasonal and daily weather patterns over southern Africa.	2000 - 2003	R 45 000	
THRIP (with SASOL and ESKOM)	<i>Project leader: Prof C.J.deW. Rautenbach</i> Highveld boundary layer winds: Purchases of a SODAR for upper air wind measurements	2001 - 2004	R 1 100 000	
South African National Antarctic Program (SANAP)	<i>Project leader: Prof C.J.deW. Rautenbach</i> Measurements and regional model studies of ocean-atmosphere interaction in the southern-ocean in	2003 - 2005	R 140 000	

	order to improve our understanding of the ocean boundary layer's contribution to sub-tropical climate and weather systems		
Water Research Commission	<i>Researcher with the project leader F.A. Engelbrecht</i> Global climate change and water resources in South Africa: Potential impacts of climate change and mitigation strategies.	2003 - 2004	R 240 000
Water Research Commission (WRC)	<i>Project Leader: Prof C.J.deW. Rautenbach</i> Regional model development to simulate atmospheric behavior and rainfall over southern Africa	2002 - 2005	R 600 000
ESKOM	<i>Project leader: Prof C.J.deW. Rautenbach</i> Drought and Climate Change: Nkomati river basin	2004	R 100 000
ESKOM	<i>Project leader: Prof C.J.deW. Rautenbach</i> Rainfall trends over South Africa: 1960–2001	2005	R 100 000
JICA	<i>Researcher with the project leader Prof W Feguson</i> Baseline Survey on National Integration of the NEPAD Environment Initiative in Southern Africa. The project was conducted with the Centre for Environmental Studies at UP and was funded by the Japanese International Coordination Agency (JICA)	2005	R 15 000
ESKOM	<i>Project leader: Prof C.J.deW. Rautenbach</i> Fine resolution wind simulations for dispersion modelling over the Matimba region (August 1991 to February 1992)	2006	R25 000
British High Commission, South Africa	<i>Project leader: Prof C.J.deW. Rautenbach</i> Development of a sustainable climate and weather modelling facility for forecasts on different time-scales over southern and central Africa.	2006 - 2007	R700 000

## 6 RESEARCH OUTPUTS

### 6.1 Publications in peer-reviewed or refereed journals

1. Jury, M.R., Pathack, B., Rautenbach, C.J.deW. and van Heerden, J. (1996). Drought over South Africa and Indian Ocean SST: Statistical and GCM results. *The Global Atmosphere and Ocean System*, **4**, 47-63.
2. Rautenbach, C.J.deW. (1996). The construction of a data point concentration dependant weight function for interpolation to rainfall grid fields. *Suid-Afrikaanse Tydskrif vir Wetenskap en Tegnologie*, **15** no **4**, 168-171.
3. Rautenbach, C.J.deW. (1998). The unusual rainfall and sea-surface temperature characteristics in the South-African region during the 1995/96 summer season. *Water SA*, **24** no **3**, 165-172.
4. Engelbrecht, F.A. and Rautenbach, C.J.deW. (2000). Perspective for nested climate modeling over southern Africa. *SA Tydskrif vir Wetenskap en Tegnologie*, **19** no **2**, 47-51.
5. Jury, M.R., Mulenga, H. and Rautenbach, C.J.deW. (2000). Tropical Atlantic variability and Indo-Pacific ENSO: Statistical analysis and numerical simulation. *The Global Atmosphere and Ocean System*, **7** no **2**, 107-124.
6. Rautenbach, C.J.deW. and Smith, I.N. (2001). Teleconnections between global sea-surface temperatures and the interannual variability of observed and model simulated rainfall over southern Africa. *Journal of Hydrology*, **254**, 1-15.
7. Rautenbach, C.J.deW. (2001). A hypothetical approach to determine the effect of palaeorotational rates on Earth's Neoproterozoic palaeoclimate. *African Earth Science*, **33**, 463-473. *(Invited paper in special edition)*
8. Eriksson, P.G., Martins-Neto, M.A., Nelson, D.R., Aspler, L.B. Chiarenzelli, J.R., Catuneanu, O., Sakar, S., Altermann, W. and Rautenbach, C.J.deW. (2001). An introduction to Precambrian basins: the characteristics and genesis. *Sedimentary Geology*, **141-142**, 1-35.
9. Engelbrecht, F.A., Rautenbach, C.J.deW., McGregor, J.L. and Katzfey, J.J. (2002). January and July climate simulations over the SADC region using the limited-area model DARLAM. *Water SA*, **28** no **4**, 361-374.
10. Olivier, J. and Rautenbach, C.J.deW. (2002). The implimentation of fog water collection systems in South Africa. *Atmospheric Research*, **64**, 227-238. *(Invited paper in special edition)*
11. Olwoch, J. M., Rautenbach, C. J. de W., Erasmus, B. F. N., Engelbrecht, F. A. & van Jaarsveld, A. S. (2003) Simulating tick distributions over sub-Saharan Africa: the use of observed and simulated climate surfaces. *Journal of Biogeography*, **30** no **8**, 1221-1232.
12. Bartman, A.G., Landman, W.A. and Rautenbach, C.J.deW. (2003) Recalibration of GCM output to austral summer rainfall over southern Africa. *International Journal of Climatology*, **23**, 1407-1419).
13. Ansoorge, I.J., Speich, S., Lutjeharms, J.R.E., Goni, G.J., Rautenbach, C.J.deW., Froneman, P.W., Rouault, M. and Garzoli, S. (2005) Monitoring the oceanic flow between Africa and Antarctica: Report of the first GoodHope cruise. *South African Journal of Science*, **101** No **12**, 29-35
14. Reason, C.J., Engelbrecht, F.A., Landman, W. A., Lutjeharms, J.R.E., Piketh, S., Rautenbach, C.J.deW and Hewitson, B.C. (2006) A review of South African research in atmospheric science and physical oceanography. *South African Journal of Science*, **102** No **1/2**, 35-45
15. Jury, M., Rautenbach, H., Tadros, M. and Philipp, A. (2007) Evaluating spatial scales of climate variability over sub-Saharan Africa. *Theoretical and Applied Climatology*, **88** No **3-4**, 169-177.

### 6.2 Books and/or chapters in books

Invited as chapter editor for the Environment South Africa book on Air Quality Management: print in 2007



### 6.3 Published full-length conference papers/keynote addresses

1. Rautenbach, C.J.deW. (1999) *Numerical rainfall forecasts for the South African 1998/99 summer season using the CSIRO-9 AGCM*. UNESCO International Conference on Drought Management: Lessons for sub Sahara Africa. CSIR Conference Center, Pretoria, South Africa (20-22 September 1999).
  2. Rautenbach, C.J.deW. and Olivier, J.J. (2001) *An operational "Water from Fog" initiative at Lepelfontein along the west coast of South Africa*. 2<sup>nd</sup> International Conference on Fog and Fog Collection, St George, New Foundland, Canada (15 – 20 July 2001)
  3. **Opening keynote address**  
Rautenbach, C.J.deW. (2003) *A prospective on numerical seasonal forecasts for South Africa by employing Australian models*. 10<sup>th</sup> National Conference of the Australian Meteorological and Oceanography Society (AMOS), University of Western Australia, Perth, Australia (10 – 12 February 2003 ).
- Also Chair of the Organizing Committee**
4. Rautenbach, C.J.deW. (2004) *Synoptic classification of rain bearing cloud systems over the Tshanova fog collection site in South Africa*. 3<sup>rd</sup> International Conference on Fog, Fog Collection and Dew, Cape Town, South Africa (1-15 October 2004)

### 6.4 Non-refereed publications or popular articles

1. Myer, M.M. and Rautenbach, C.J.deW. (1998) The Drakensberg escarpment in Mpumalanga: A brief geo-botanical tour between the Sadwala Caves and the Abel Erasmus Pass. *Archimedes*, **40** no 1.
2. Rautenbach, C.J.deW. and Jordaan, W. (1999) A proposed course for training Meteorologists in South Africa. *Newsletter: South African Society for Atmospheric Sciences*, No **29**.
3. Rautenbach, C.J.deW. (2002) *Klimaat: globale verwarming as gevolg van die vermeerdering van kweekhuisgasse in die atmosfeer*. *Ons Eie (journal of the South West Agriculture region: ISBN 0259934)*, **37** no 1, 22-24.
4. Rautenbach, C.J.deW. (2003) *Climate Change: Engineering challenge of the 21<sup>st</sup> century*. Contribution to *Water Sewage & Effluent*, **23** no 1, 20-22

### 6.5 Patents

None

### 6.6 Technical reports

1. Van Heerden, J., Rautenbach, C.J.deW. and Truter, M.M. (1995). *Techniques for seasonal and longer term rainfall predictions in South Africa*. *Water Research Commission Report*, No. **306/1/95**, 51pp.
2. Van Heerden, J., Truter, M.M. and Rautenbach, C.J.deW. (1995) *Development of a real-time, non-conventional rainfall mapping system*. *Water Research Commission Report*, No **438/1/95**, 29pp.
3. Rautenbach, C.J.deW. (2003) *Seasonal climate predictions with a coupled atmosphere-ocean general circulation model*. *Water Research Commission Report*, No **904/1/03**, 82pp
4. Cleaver, G., Brown, L.R., Bredenkamp, G.J., Smart, M.C. and Rautenbach, C.J.deW. (2003) *Assessment of environmental impact of ground water abstraction from table mountain group (TMG) aquifers on ecosystems in the Kammanassie Nature Reserve and environs*. *Water Research Commission Report*, No **1115/1/03**, 71pp
5. Rautenbach, C.J.deW., Mphepya, J. and Piketh S. (2004) *Drought and climate change : Nkomati*. Research report submitted to ESKOM. Report no: **RES/RR/04/24553**, 47pp.
6. Rautenbach, C.J.deW., Mphepya, J. (2005) *Observed rainfall trends over South Africa: 1960 – 2001*. Research report submitted to ESKOM. Report no: **RES/RR/04/25332**, 22pp.

7. Ferguson J.W.H., Rautenbach, C.J.deW., le Roux, J. and Benefeldt, R. (2005) JICA Baseline Survey on National Integration of the NEPAD Environment Initiative in Southern Africa. Research Report submitted to the Japanese International Coordination Agency (JICA), 89pp.
8. Rautenbach, C.J.deW. Rautenbach, Engelbrecht, F.A., Ndarana, T., Engelbrecht, C. and McGregor, J.L. (2005) Regional model development for simulating atmospheric behaviour and rainfall over southern Africa. *Water Research Commission Report*, No 1261/ 1/05, 121pp.

## 7 OTHER SCHOLARLY RESEARCH-BASED CONTRIBUTIONS

### 7.1 Participation in conferences, workshops and short courses - specify type of contribution

#### 7.2.1 National

1. **1995: Oral presentation (Award for best presentation by a young scientist)**  
Rautenbach, C.J.deW. (1995) *The implementation of a hybrid vertical coordinate system on the non-linear dynamics of the CSIRO-9 AGCM*. 12<sup>th</sup> Annual Conference of the South African Society for Atmospheric Sciences, SANLAM Auditorium, University of Pretoria, Pretoria (October 1995)
2. **1996: Oral presentation**  
Rautenbach, C.J.deW. and van Heerden, J. (1996) *The characteristics of the anomalous rainfall and sea-surface temperature fields which occurred over the South African region during the 1995/96 summer season*. 13<sup>th</sup> Annual Conference of the South African Society for Atmospheric Sciences, Breakwater Lodge & Conference Center, Waterfront, Cape Town. (October 1996)
3. **1997: Oral presentation (Seminar was organized by me)**  
Rautenbach, C.J.deW. (1997) *Numerical seasonal predictions for South Africa by using the CSIRO-9 (R21) general circulation model*. Half-day symposium on Numerical Seasonal Climate Predictions. University of Pretoria, Pretoria (October 1997)
4. **1998: Poster presentation**  
Rautenbach, C.J.deW. (1998) *Teleconnections between global sea-surface temperatures and the inter-annual variability of observed and model simulated rainfall over southern Africa*. Annual Research Seminar of the School for Mining and Mineral Sciences, University of Pretoria, Pretoria (September 1998)
5. **1999: Poster presentation (Session Chair during conference)**  
Rautenbach, C.J.deW. and Eriksson, P. (1999) *The contribution of rotation rate to the global climate of the Earth; a GCM approach towards Precambrian climates*. 16<sup>th</sup> Annual Conference of the South African Society for Atmospheric Sciences, Richards Bay. (October 1999)
6. **1999: Oral presentation**  
Rautenbach, C.J.deW. (1999) *Precambrian atmospheric circulation: a general circulation model (GCM) approach*. Annual Research Seminar of the School for Mining and Mineral Sciences, University of Pretoria, Pretoria (1 October 1999)
7. **2000: Oral presentation (Session Chair during conference)**  
Engelbrecht, F.A. and Rautenbach, C.J.deW. (2000) *Nested climate modeling over southern Africa with the limited area model DARLAM*. 17<sup>th</sup> Annual Conference of the South African Society for Atmospheric Sciences, SANLAM Auditorium, University of Pretoria, Pretoria (16-17 October 2000)
8. **2000: Oral presentation (Session Chair during conference)**  
Rautenbach, C.J.deW. (2000) *Seasonal surface temperature and rainfall projections with a coupled atmosphere-ocean general circulation model*. 17<sup>th</sup> Annual Conference of the South African Society for Atmospheric Sciences, SANLAM Auditorium, University of Pretoria, Pretoria (16-17 October 2000)
9. **2001: Oral presentation (Session Chair during conference)**  
Rautenbach, C.J.deW. (2001) *A cost-effective procedure to construct coupled ocean-atmosphere model seasonal rainfall forecasts for South Africa*. 18<sup>th</sup> Annual Conference of the South African Society for Atmospheric Sciences,

- Breakwater Lodge & Conference Center, Waterfront, Cape Town. (6-7 October 2001)
10. *2001: Oral presentation (Session Chair during conference)*  
Thovhakale, B., Engelbrecht, F.A. and Rautenbach, C.J.deW. (2001) *Comparison of numerical techniques suitable for simulating moisture advection over southern Africa*. 18<sup>th</sup> Annual Conference of the South African Society for Atmospheric Sciences, Breakwater Lodge & Conference Center, Waterfront, Cape Town. (6-7 October 2001)
  11. *2001: Poster presentation (Session Chair during conference)*  
Rautenbach, C.J.deW. (2001) *A field experiment measuring temperatures of pharmaceutical products in various transport units*. 18<sup>th</sup> Annual Conference of the South African Society for Atmospheric Sciences, Breakwater Lodge & Conference Center, Waterfront, Cape Town. (6-7 October 2001)
  12. *2001:Poster presentation (Session Chair during conference)*  
Engelbrecht, F.A. and Rautenbach, C.J.deW. (2001) *Full seasonally varying climate simulations over southern Africa with a limited area model*. 18<sup>th</sup> Annual Conference of the South African Society for Atmospheric Sciences, Breakwater Lodge & Conference Center, Waterfront, Cape Town. (6-7 October 2001)
  13. *2001: Oral presentation (Workshop was organized by me - formed part of an UP research project)*  
Rautenbach, C.J.deW. (2001) *Introduction to numerical techniques (finite difference methods)*. Workshop 1: Introduction to atmospheric modeling. Department of Geography, Geoinformatics and Meteorology, University of Pretoria, Pretoria (13-16 August 2001)
  14. *2002: Oral presentation (Invited speaker)*  
Rautenbach, C.J.deW. (2002) *Model simulations of global and regional scale climate change scenarios over sub-Saharan Africa*. Climate Change Workshop, South African Sugar Technologists' Association, Mount Edgecombe, KwaZulu-Natal (28 November 2002)
  15. *2002: Oral presentation (Chair: Organizing Committee / Side-event: World Summit on Sustainable Development)*  
Bhekizitha, M., Rautenbach, C.J.deW. and Engelbrecht, F.A. (2002) *Characteristics of cumulus parameterization schemes over southern Africa*. 19<sup>th</sup> Annual Conference of the South African Society for Atmospheric Sciences, Momentum Head Office, Centurion. (26 – 27 Augustus 2002)
  16. *2002: Oral presentation (Chair: Organizing Committee / Side-event: World Summit on Sustainable Development)*  
Olwoch, J.M., Rautenbach, C.J.deW., Erasmus, B.F.N., Engelbrecht, F.A. and van Jaarsveld, A.S. (2002) *Simulating the spatial distribution of ticks over sub-Saharan Africa by using high-resolution climate data*. 19<sup>th</sup> Annual Conference of the South African Society for Atmospheric Sciences, Momentum Head Office, Centurion. (26 – 27 Augustus 2002)
  17. *2002: Oral presentation (Chair: Organizing Committee / Side-event: World Summit on Sustainable Development)*  
Thackrah, A., Rautenbach, C.J.deW. and Flasse, S. (2002) *Verification of rainfall grid fields for use in locust outbreak research over the western parts of southern Africa*. 19<sup>th</sup> Annual Conference of the South African Society for Atmospheric Sciences, Momentum Head Office, Centurion. (26 – 27 Augustus 2002)
  18. *2002: Oral presentation (Chair: Organizing Committee / Side-event: World Summit on Sustainable Development)*  
Bopape, M., Engelbrecht, F.A. and Rautenbach, C.J.deW. (2002) *Climate change scenarios over southern Africa as simulated by the regional model DARLAM*. 19<sup>th</sup> Annual Conference of the South African Society for Atmospheric Sciences, Momentum Head Office, Centurion. (26 – 27 Augustus 2002)
  19. *2002: Oral Presentation*  
Rautenbach, C.J.deW. *Numerical techniques applicable to atmospheric modeling on the synoptic and regional special scale*. Lecture presented at the Assessments of Impacts and Adaptations to Climate Change (AIACC) workshop for project AF07, Environmental and Geographical Science Building, University of Cape Town, Cape Town (18-20 June 2002)
  20. *2002: Oral presentation (Workshop formed part of a UP research project)*  
Rautenbach, C.J.deW. (2002) *Introduction to cumulus convection parameterization & The Arakawa cumulus convection scheme in regional atmospheric models*. Workshop 2: Introduction to atmospheric modeling. Department of Geography, Geoinformatics and Meteorology, University of Pretoria, Pretoria (25-28 November 2002)

21. *2003: Oral presentation*  
Rautenbach, C.J.deW. and Ndarana, T. (2003) *Regional scale atmospheric modeling over southern Africa by means of a variable resolution global model*. Colloquium, South African Weather Service Head Office, Pretoria. (6 June 2003)
22. *2003: Oral presentation*  
Rautenbach, C.J.deW. (2003) *Ocean-atmosphere interaction over the Southern Ocean*. South African National Antarctic Program (SANAP) Workshop. University of Stellenbosch (1-2 July 2003)
23. *2003: Oral presentation (Session Chair during conference)*  
Ndarana, T., Rautenbach, C.J.deW. (2003) *A Conformal Cubic Projection on the Sphere for Regional Atmospheric Model Simulations*. 20<sup>th</sup> Annual Conference of the South African Society for Atmospheric Sciences, Farm Inn, Pretoria, (13 – 14 October 2003)
24. *2003: Oral presentation (Session Chair during conference)*  
Rautenbach, C.J.deW. (2003) *The Influence of variable horizontal resolution in the conformal cubic model on atmospheric simulations over Africa*. 20<sup>th</sup> Annual Conference of the South African Society for Atmospheric Sciences, Farm Inn, Pretoria, (13 – 14 October 2003)
25. *2003: Oral presentation (Session Chair during conference)*  
Ngwana, I. and Rautenbach, C.J.deW. (2003) *Regional climate simulations by the C-CAModel over southern Africa*. 20<sup>th</sup> Annual Conference of the South African Society for Atmospheric Sciences, Farm Inn, Pretoria, (13 – 14 October 2003)
26. *2003: Poster presentation (Session Chair during conference)*  
Gertenbach, J. and Rautenbach, C.J.deW. (2003) *Boundary Layer Studies at the University of Pretoria*. 20<sup>th</sup> Annual Conference of the South African Society for Atmospheric Sciences, Farm Inn, Pretoria, (13 – 14 October 2003)
27. *2005: Poster presentation (Session Chair during conference)*  
Gerber, B and Rautenbach, C.J.deW. (2005) *Verification of Numerical Weather Predictions with C-CAM over South Africa*. 22<sup>th</sup> Annual Conference of the South African Society for Atmospheric Sciences, Richardsbay, (20-23 September 2003)
28. *2005: Poster presentation (Session Chair during conference)*  
Le Roux, N and Rautenbach, C.J.deW. (2005) *Track and intensity forecasting of tropical cyclones over the south-west Indian Ocean*. 22<sup>th</sup> Annual Conference of the South African Society for Atmospheric Sciences, Richardsbay, (20-23 September 2003)
29. Also: A number of oral presentations on progress and final research report feedback at Water Research Commission Steering Committee, ESKOM and other project progress meetings.

### 7.2.2 International

1. *1997: Poster presentation*  
Van Heerden, J. and Rautenbach, C.J.deW. (1997) *A GCM simulation of the impact on the atmospheric circulation over Africa by boundary forcing due to sea-surface temperature anomalies in the central Indian Ocean*. 5<sup>th</sup> International Conference on Southern Hemisphere Meteorology and Oceanography, SANLAM Auditorium, University of Pretoria, Pretoria, South Africa (7-11 April 1997)
2. *1997: Poster presentation*  
Rautenbach, C.J.deW. and Smith, I.N. (1997) *Seasonal variability in observed and GISST simulated rainfall over southern Africa*. 5<sup>th</sup> International Conference on Southern Hemisphere Meteorology and Oceanography, SANLAM Auditorium, University of Pretoria, Pretoria, South Africa (7-11 April 1997)
3. *1997: Oral presentation*  
Rautenbach, C.J.deW. (1997) *A GCM study describing teleconnections between global SST anomalies and the*

- copious summer rainfall over South Africa during 1995/96. 5<sup>th</sup> International Conference on Southern Hemisphere Meteorology and Oceanography, SANLAM Auditorium, University of Pretoria, Pretoria, South Africa (7-11 April 1997)*
4. *1997: Poster presentation*  
Smith, I.N. and Rautenbach, C.J.deW. (1997) *Interdecadal fluctuations of climate in the vicinity of the Indian Ocean as revealed by long-term climate model simulations. 5<sup>th</sup> International Conference on Southern Hemisphere Meteorology and Oceanography, SANLAM Auditorium, University of Pretoria, Pretoria, South Africa (7-11 April 1997)*
  5. *1998: Oral presentation (Session Chair during conference)*  
Rautenbach, C.J.deW. (1998) *The CSIRO-9 AGCM and climate variability over southern Africa. Conference of the Australian Meteorological and Oceanography Society (AMOS). Victoria University, Wellington, New Zealand (March 1998)*
  6. *1999: Oral presentation*  
Rautenbach, C.J.deW. (1999) *Numerical rainfall forecasts for the South African 1998/99 summer season using the CSIRO-9 AGCM. UNESCO International Conference on Integrated Drought Management: Lessons for sub-Saharan Africa, CSIR Conference Center, Pretoria, South Africa (20-22 September 1999)*
  7. *1999: Oral presentation*  
Engelbrecht, F.A. and Rautenbach, C.J.deW. (1999) *The contribution of extra-tropical sea-surface temperature anomalies to the 1996/97 rainfall simulations over the South African summer rainfall region. UNESCO International Conference on Integrated Drought Management: Lessons for sub-Saharan Africa, CSIR Conference Center, Pretoria, South Africa (20-22 September 1999)*
  8. *2000: Oral presentation*  
Rautenbach, C.J.deW. (2000) *A numerical seasonal rainfall forecast for South Africa for the 2000/2001 summer season. Annual meeting of the Southern African Regional Climate Outlook Forum (SARCOF), Gaborone, Botswana (18-22 September 2000)*
  9. *2001: 2 x Oral presentations (Invited speaker for two presentations)*  
Rautenbach, C.J.deW. (2001) *Perspectives of dynamic modeling of the seasonal forecast in southern Africa. Annual meeting of the Southern African Regional Climate Outlook Forum (SARCOF), Mangochi, Malawi (17-21 September 2001)*
  10. *2001: Oral presentation*  
Rautenbach, C.J.deW. and Olivier, J. (2001) *An operational "Water from Fog" initiative at Lepelfontein along the west coast of South Africa. 2<sup>nd</sup> International Conference on Fog and Fog Collection, St George, New Foundland, Canada (15 – 20 July 2001)*
  11. *2003: Oral presentation (Invited speaker)*  
Rautenbach, C.J.deW. (2003) *Fog as an alternative source of drinking water in South Africa. School of Mathematical Sciences, University of Monash, Melbourne, Australia (19 February 2003)*
  12. *2003: Oral presentation (Invited speaker)*  
Rautenbach, C.J.deW. (2003) *Seasonal forecasting and climate change scenario experiments for South Africa by using atmospheric models developed by the CSIRO Atmospheric Research. CSIRO Atmospheric Research, Melbourne, Australia (14 February 2003).*
  13. *2003: Oral presentation (Invited to present the opening key note address)*  
Rautenbach, C.J.deW. (2003) *A prospective on numerical seasonal forecasts for South Africa by employing Australian models. 10<sup>th</sup> National Conference of the Australian Meteorological and Oceanography Society (AMOS), University of Western Australia, Perth, Australia (10 – 12 February 2003 ).*
  14. *2004: Oral Presentation (Session Chair during conference)*  
Rautenbach, C. J. de W. (2004) *Likely future climate changes in temperature and rainfall in the Komati river catchment basin. 9<sup>th</sup> International Meeting on Statistical Climatology and 21<sup>st</sup> Annual Conference of the South African Society for Atmospheric Sciences, Cape Town, South Africa (24-28 May 2004)*

15. *2005: Poster Presentation (Session Chair during conference)*  
Rautenbach, C.J.deW. (2005) Observed monthly and seasonal rainfall trends over South Africa (1960-2001) Scientific Assembly of the International Association of Meteorology and Atmospheric Sciences of the International Union of Geodesy and Geophysics (IAMAS2005) 2-11 August 2005, Beijing, China.

## 7.2 Teamwork and collaboration with others:

### Researchers (National and International)

1. Dr John McGregor (Model Development and Analysis) CSIRO Atmospheric Research, Melbourne, Australia
2. Dr Ian Smith (Climate Applications) CSIRO Atmospheric Research, Melbourne, Australia
3. Dr Bill Physick (Program Leader: Pollution Modelling) CSIRO Atmospheric Research, Melbourne, Australia
4. Prof Johann Lutjeharms (Department of Oceanography) University of Cape Town
5. Prof Bruce Hewitson (Department of Environmental and Geographical Science) University of Cape Town
6. Prof Jana Olivier (Department of Geography and Environmental Sciences) University of South Africa
7. Prof Lesley Brown (Department of Applied Natural Sciences) Technikon of South Africa
8. Prof Mark Jury (Department of Geographical Sciences) University of Zululand
9. Dr Stuart Piketh (Director: Climatology Research Group) University of the Witwatersrand
10. Prof Willem Landman (Senior Specialist Scientist: Research) South African Weather Service
11. Dr Amos Makarau (Director) Meteorological Service Department of Zimbabwe
13. Ms Cindy Bruyere (Researcher) National Center for Atmospheric Research (NCAR) in the USA
14. Dr George Green (Deputy Chief Executive Officer) Water Research Commission of South Africa
15. Dr Kevin Welsh (Senior Lecturer) Meteorology, University of Melbourne, Australia
16. Dr Jonas Mphepya Chief Executive Officer, South African Weather Service

### Research Institutions (National and International)

1. CSIRO Atmospheric Research, Melbourne, Australia (*atmospheric modeling*)
2. NCAR, Boulder, United States of America (*atmospheric modeling*)
3. South African Weather Service (*training and research*)
4. Water Research Commission of South Africa (*atmospheric research*)
5. Department of Environmental Affairs and Tourism – SA National Antarctic Program (*southern Ocean research*)
6. Department of Arts, Culture, Science and Technology of South Africa (*innovation fund research*)
7. Agriculture Research Council of South Africa (*MSc supervision: research in locus outbreak, WineTech*)
8. Lesotho Meteorological Services (MSc supervision: *research on snow measurement and duration*)
9. National Research Foundation (*THRIP research*)
10. University of Cape Town (*atmospheric modeling*)
11. University of the Witwatersrand (*air pollution*)
12. University of South Africa (*fog water harvesting*)
13. University of Zululand (*global climate variability*)
14. University of the North (*atmospheric modeling*)
15. Universities of Melbourne and Monash, Melbourne, Australia (*atmospheric modeling and training*)
16. British High Commission in South Africa (*Atmospheric modeling in Africa*)

### Industry

1. **SASOL**  
On air quality research which involves the development of real-time fine resolution wind fields suitable for dispersion modeling. For this purpose expensive equipment (SODAR) have been acquired though THRIP funding.
2. **ESKOM**  
With SASOL involved in air quality research.
3. **NETSYS International / Tabia Endelevu Africa**  
The company is responsible for software development that facilitates complex Meteorological data exchange. The South African Weather Service makes use of NETSYS software. After negotiations NETSYS agreed to install software at UP which will assist with frequent data transfer between UP and industry. Support will be supplied in future.
4. **Airshed Professional Services**

Air pollution modeling. Modeling of diagnostic wind fields with a MSc student at Airshed

5. **South African Weather Service (SAWS)**

It is essential that the good relationship between UP and the SAWS persist in future. UP is closely involved in the training of Meteorologists and is the only university that issues a BSc Meteorology degree. Since the SAWS commercialized it is my intention to encourage stronger research collaboration.

**7.3 Membership in national and international bodies**

**Society Membership**

1. South African Society for Atmospheric Sciences (SASAS)
2. National Association for Clean Air (NACA)
3. Suid-Afrikaanse Akademie vir Wetenskap en Tegnologie

**Involvement**

1. From 2000 – 2006  
**Executive Council** of the South African Society for Atmospheric Sciences
2. From 2000 - 2002  
**Secretary** of the South African Society for Atmospheric Sciences
3. 2000 - 2006  
**Editor** of the Newsletter: South African Society for Atmospheric Sciences
4. 2002 - 2006  
**Vice President** of the South African Society for Atmospheric Sciences

**7.4 Visits to local and overseas universities or research institutes as guest professor or researcher**

**VISITS TO RESEARCH INSTITUTIONS**

1. 1995: (Researcher: CSIRO Atmospheric Research, Melbourne, Australia)  
Research on the introduction of a hybrid vertical co-ordinate system to the non-linear dynamics of the CSIRO Atmospheric General Circulation Model. The implementation of the international CSIRO9 (R21) Atmospheric General Circulation Model on a super computer in South Africa.
2. 1996: (Researcher: CSIRO Atmospheric Research, Melbourne, Australia)  
Research on comparisons in climate variability (1xCO<sub>2</sub>) between observed and model simulated (CSIRO9 (T63) Atmospheric General Circulation Model) over Southern Africa. The GISST observed sea surface temperature fields have been used to force the model over a period of 30 years.
3. 1998: (Researcher: CSIRO Atmospheric Research, Melbourne, Australia)  
Research on coupled ocean/atmosphere modeling as part of the CLIPWATER project of the Water Research Commission in South Africa.
4. 1999: (Researcher: CSIRO Atmospheric Research, Melbourne, Australia)  
Research on coupled ocean/atmosphere modeling as part of the CLIPWATER project of the Water Research Commission in South Africa.
5. 2000: (Researcher: CSIRO Atmospheric Research, Melbourne, Australia)  
Research on coupled ocean/atmosphere modeling as part of the CLIPWATER project of the Water Research Commission in South Africa. Regional model development. Transfer DARLAM to South Africa.
6. 2003: (Researcher: CSIRO Atmospheric Research, Melbourne, Australia)  
Research on the implementation of a Conformal Cubic Model over southern Africa as part of a Water Research Commission project on Model development. Transfer the CCAModel to South Africa
7. 2004: (Researcher: CSIRO Atmospheric Research, Melbourne, Australia)  
Research on the implementation of a Conformal Cubic Model over southern Africa as part of a Water Research Commission project on Model development. Study of the implementation of a Numerical Weather Prediction system

in South Africa.

- 8      2005: (Researcher: ASGRISSEON, Agricultural Research Society of Namibia).  
Developed software to interpolate daily rainfall data over the Windhoek-Gobabis area. The research later led to a Namibian domain interpolation.

## 8 ARTISTIC OUTPUTS (if applicable)

None

## 9 MANAGEMENT AND ADMINISTRATIVE DUTIES

Since March 2000 I took responsibility for managing the Meteorology Group at the University of Pretoria. This was shortly after the Meteorology Group moved from the Faculty of Engineering (a 4-year BSc Meteorology degree was presented) to the Faculty of Natural and Agricultural Sciences (a 3-year BSc Meteorology degree was introduced). From 2000 to 2005 the following have been achieved:

### Upgrading under and post graduate courses

1. The content of a new 3-year BSc Meteorology degree was finalized and introduced.
2. Major changes were introduced to the BSc(Hons) Meteorology degree, since the latter became the official qualification for a professional Meteorologist after the 3-year BSc Meteorology degree was introduced (in contrast to the previous 4-year degree). Note that the University of Pretoria is the only national university that presents degrees in Meteorology, and is therefore traditionally the only university where one can qualify as a professional Meteorologist. Changes to the BSc(Hons)(Meteorology) degree programme include the challenge that candidates with a normal BSc degree were also allowed to enroll for the BSc(Hons) Meteorology degree. Previously only candidates with a BSc Meteorology degree was allowed to enroll for the BSc(Hons) Meteorology degree.
3. I took full responsibility for negotiating, compiling the structure, and registering the (a) BSc Meteorology degree, (b) BSc (Hons) Meteorology degree, (c) MSc Meteorology degree and (d) PhD degree in Meteorology in accordance to SAQA guidelines during the year 2001.
4. In 2002 it was decided to introduce selected prerequisites to the BSc(Hons) Meteorology degree, especially for candidates with no Meteorological background. I negotiated this with the South African Weather Service (our main client and close partner in training) and a 6-month prerequisite course (Science Special in addition to the BSc(Hons) Meteorology degree) was successfully introduced and presented in 2002.
5. In 2004 I developed and arrange for the presentation of new courses in Air Quality Management at the Centre for Environmental Studies.

The above courses are still successfully running.

### Student numbers

Since I took responsibility for the Meteorology group, I introduce active measures to increase student numbers. These involved:

1. The establishment of a telematic training option for 1<sup>st</sup> year students in Meteorology. This resulted in an increase of more than 300% in first year student numbers in 2005 (from the traditional less than 10 students before 2002 to 40-50 students after 2002).



2. Encouragement of 2<sup>nd</sup> and 3<sup>rd</sup> year students from other disciplines (especially students with mathematics) to enroll for 3<sup>rd</sup> year Meteorology courses. Increasing numbers of students from Mathematics, Geology, Physics, Chemistry are enrolling for Meteorology modules.

*These measure ensured that we received, for the first time in history, more than 10 students per Meteorology course in 2003, 2004, 2005 (excluding the 3<sup>rd</sup> year research project).*

### **Research**

I introduced a more aggressive and sustainable approach towards research with the focus on research in Atmospheric Modeling. The following measures were introduced:

1. A research facility known as the *Laboratory for Research and Training in Atmospheric Modeling* (LRAM) was established in room 1-17 of the Geography Building. This initiative followed from a research project funded by the Water Research Commission of South Africa.
2. Measures were taken to increase the number of post-graduate students in Meteorology (MSc and PhD) - see list of post-graduate students since 2000 in this CV. Since staff in the Meteorology Group is limited, external supervisors were appointed without any additional costs (Dr W.A. Landman from the South African Weather Service was appointed as honorary Professor for this purpose – with Prof Landman the Meteorology Group now has more post graduate students than it would have without Prof Landman..
3. Research funds were obtained for many research projects and collaboration from various national and international research institutions were encouraged (see list of funding since 2000 in this CV).

*The Meteorology Group has more enrolled post-graduate students than ever in history, and it is anticipated that the number of students graduating on post-graduate level will increase in the following years.*

### **Other**

1. Proposed and managed (with the help of Prof K.S.O. Beavon) the shift of Meteorology from the Department of Earth Sciences to the newly established Department of Geography, Geoinformatics and Meteorology.
2. Maintaining a good relationship with the Directorate of Training of the South African Weather Service. This is achieved by finding a balance between a high standard in training and training that is relevant to the present day career requirements of a professional Meteorologist.
3. Normal administrative duties related to student training and research.
4. Maintaining the web page of the Meteorology Group
5. Working with the Center of Environmental Studies in training Air Quality Managers.
6. Acting Head of the Department of Geography, Geoinformatics and Meteorology during December 2002 and January 2003 and from 1 October 2005 to 31 March 2006. During the last period two full time staff members were appointed in the department. Both of these members are black which contribute significantly to transformation in the department.

## **10 COMMUNITY SERVICE OR PROFESSIONAL SKILLS**

### **10.1 Outreach projects**

1. *1997 - 2002:*  
Actively participating in the *Southern Africa Regional Climate Outlook Forum (SARCOF) - annual meetings sponsored by the World Meteorological Organization and the United Nations Development Fund and hosted by the Drought Monitoring Centre in Harare.*  
The purpose of SARCOF is to issue an early and late summer rainfall forecast for all the SADC countries. Inputs from leading institutions in SADC and from the international community are used.
2. *1998 - 2002:*  
Issuing *seasonal climate predictions with a coupled Atmosphere/Ocean General Circulation Model to the South African community through the South African Weather Service. This is a contribution to water resource management over Southern Africa - project sponsored by the Water Research Commission (project leader).*  
Development of a global numerical model with the aim to forecast rainfall (droughts and floods) over southern Africa. This is performed in collaboration with international scientists.
3. *1987 - 2003*  
*Erected an Earth-Satellite automatic weather station (AWS) at the Kunene river mouth (border between Namibia and South Africa).*  
The objective is to make data from this remote site available to Weather services in Southern Africa.
4. *1998 - 2005:*  
*Implementing of operational proto-type fog water collection systems - project sponsored by the Water Research Commission and SANPAD.*  
A fog net with 3 x 10000 liter water tanks has been erected at the Tshenowa Junior Primary school in the Northern Province. As a result sufficient drinking water, which was not previously available, are now supplied for use by the school. A similar system has been erected along the West Coast and in the Eastern Cape.
5. *2001- 2003:*  
*Planned and presented two international workshop on regional atmospheric modeling - August 2001 and November 2002. Delegates from 9 SADC countries (Weather Services and Universities) attended.*  
One of the objectives of the workshop is to establish regional (SADC) limited area model weather forecasting systems in all the SADC Weather Services who are interested. This has been arranged in close collaboration with the South African Weather Service.
6. *2002-2005:*  
*Supply fine resolution wind data to SASOL and ESKOM for use in pollution modeling*  
A computer facility that generates hourly 15kmx15km wind fields over the eastern Highveld is available the University of Pretoria.
7. *2005-present:*  
*The implementation of a routine Numerical Weather Prediction system at UP.*  
It is the first time that an institution other than the South African Weather Service runs such a system. The system uses a first class numerical weather prediction model to produce weather forecasts of four days in advance on a daily basis. During 2005 results were validated against observations, which indicated that the model has significant skill in forecasting rainfall, temperatures and upper level pressure systems. The research initiated further research in Africa where the system will be implemented at the Uganda Department of Meteorology during 2006 and 2007. This project is funded by the United Kingdom High Commission in South Africa.

## **10.2 Professional service performed**

### **Conferences: Chair of Organizing Committees**

1. *2001 - 2002*  
Chair of the Organizing Committee of the 19<sup>th</sup> Annual Conference of the South African Society for Atmospheric Sciences (SASAS), 26 and 27 August 2002, Momentum Head Office, Centurion (presented as an official side-event of the World Summit on Sustainable Development (WSSD), 40 oral and 20 poster presentations, more than 200 delegates)

2. *2003 - 2004*  
Chair of the Organizing Committee of the 3<sup>rd</sup> International Conference on Fog, Fog Collection and Dew, 11-15 October 2004, Commodore Hotel, Victoria & Alfred Waterfront, Cape Town, South Africa.

### **Steering Committees**

1. *1997 - 2000*  
Member of the steering committee of the Water Research Commission funded project entitled:  
Dynamical modeling to investigate the regional climate response to global change forcing (University of Cape Town)
2. *1998 - 2001*  
Member of the steering committee of the Water Research Commission funded project entitled:  
Climatology of water vapor sources, sinks and transport in southern Africa (University of Cape Town)
3. *1999 - 2002*  
Member of the steering committee of the Water Research Commission funded project entitled:  
The ocean's role in South Africa's rainfall (University of Cape Town)
4. *1999 - 2002*  
Member of the steering committee of the Water Research Commission funded project entitled:  
Modeling variability in the Agulhas current system and its influence on South Africa's climate (University of Cape Town)
5. *1999 - 2001*  
Member of the steering committee of the Water Research Commission funded project entitled:  
Optimal statistical long-range forecast models of summer climate and hydrological resources over southern Africa (University of Zululand)
6. *1999 - 2002*  
Member of the steering committee of the Water Research Commission funded project entitled:  
Implementation of an operational prototype fog water collection system (Universities of the North and UNISA)
7. *2000 - 2003*  
Member of the steering committee of the Water Research Commission funded project entitled:  
Atmospheric moisture transport and sources for southern Africa (University of Cape Town)
8. *2000 - 2003*  
Member of the steering committee of the Water Research Commission funded project entitled:  
Dynamic modeling of present and future climate system variability at inter-annual and inter-decadal time scales (University of Cape Town)
9. *2003 - 2005*  
Member of the steering committee of the Water Research Commission funded project entitled:  
Hydroclimatic variation over southern Africa at intra-annual and inter-annual time scales, with special reference to the role of the oceans (University of Cape Town)
10. *2003 - 2005*  
Member of the steering committee of the Water Research Commission funded project entitled:  
Skill comparison of dynamical and empirical down-scaling methods for southern africa from a seasonal climate modelling perspective (South African Weather Service)
11. *2004 - 2006*  
Member of the steering committee of the Water Research Commission funded project entitled:  
Model output statistics applied to multi-model ensemble long-range forecasts over South Africa (South African Weather Service)
12. Member of the steering committee of the Water Research Commission funded project entitled:  
The role of antecedent conditions in determining rainfall characteristics during the early part of the rainfall season (University of Cape Town)

### **Reviewer**

*2002 - 2005*: Often invited to serve as reviewer in the selection of research proposals submitted for funding at the Water Research Commission.

*2000 - 2005*: Invited to review more than 10 national and international scientific papers.

**Radio / TV appearances and media**

2003 - 2005: A number of radio and TV interviews (RSG, SABC Africa, SABC TV). The media often contact me for weather related information.

**Court Cases**

2001-2005: Assist in a number of court cases with information related to weather conditions, for example:

Stormsriver Adventurers CC Re Tubing Accident (25 March 2000). Weber Wentzel Bowens Attorneys Notaries & Conveyancers, Intellectual Property Lawyers, Sandton.

Heavy rainfall that caused damage in Johannesburg and Pretoria.

**Other**

2005: Invited by the Environmental Scientific Association (ESA) of South Africa to serve as chapter author in the writing of a 'science to policy' book covering current air quality issues in South Africa

2005: Acting SASAS President at the annual conference of the South African Society for Atmospheric Sciences (SASAS)

**10.3 Clinical service**

None

**10.4 Involvement with other universities/scientific institutions**

(e.g. external examiner, editor of journal, advisory council, CSIR, SA Council for Scientific Professions)

**External examiner**

1. 2001:

Shannon D. (2001), *Atmosphere-vegetation interactions over South Africa*. MSc dissertation under supervision of Prof Bruce Hewitson (Department of Environmental and Geographical Science), University of Cape Town.

2. 2003:

Barenburg, M (2003) *The transport of aerosols and their direct effects on solar radiation over southern Africa*. MSc dissertation under supervision of Dr Stuart Piketh (Director: Climatology Research Group), University of the Witwatersrand.

**Editor of Journal**

1. 2005 - 2006:

Appointed as Co-Editor of a special issue of the journal Atmospheric Science on Fog, Dew and Fog Water Collection. Editor-in-Chief of Atmospheric Research: Prof. A. Flossman. Editor of special issue: Simon Berkowicz (Jerusalem)

2. 2005 - 2006:

Appointed as Editorial Board Member of the journal: WATER SA.

**Advisory Council**

1. 2005:

Appointed as Panel Member on the Technical Advisory Group for the City of Tshwane Air Quality Management Plan

**Invited lectures****2006:**

1. Invited by The University of Johannesburg to give a number of lectures at the Soweto Campus on Air Pollution Meteorology. Wednesday, 8 March 2006, 09:00 to 16:30

**Other**

1. 2005:

Appointed as Co-Editor of a special issue of the journal Atmospheric Science on Fog, Dew and Fog Water Collection. Editor-in-Chief of Atmospheric Research: Prof. A. Flossman. Editor of special issue: Simon Berkowicz (Jerusalem)

2. 2005:

Appointed as member of the Scientific Committee of the 4<sup>th</sup> International Conference on Fog, Fog Water Collection and Dew that will be held in Chile in 2007.

## 10.5 Referee duties

### Journals

1. 1999: Invited to act as reviewer for the Journal of Climate (international)
2. 2000: Invited to act as reviewer for Water SA (local)
3. 2000: Invited to act as reviewer for a chapter in the well-known Intergovernmental Panel on Climate Change (IPCC) report that appeared in 2001 (international)
4. 2001: Invited to act as reviewer for the South African Journal of Science (local)
5. 2001: Invited to act as reviewer for Water SA (local)
6. 2001: Invited to act as reviewer for African Earth Sciences (international)
7. 2002: Invited to act as reviewer for Water SA (local)
8. 2002: Invited to act as reviewer for Atmospheric Research (international)
9. 2003: Invited to act as reviewer for Water SA (local)
10. 2004: Invited to act as reviewer of Water SA (local)
11. 2005: Invited to act as reviewer for 3 papers for the South African Journal of Science (local)
12. 2005: Invited to act as reviewer for Water SA (local)
13. 2006: Invited to act as reviewer for Atmospheric Research (international)

## 11 AWARDS AND SCIENTIFIC/SCHOLARLY RECOGNITION

### 11.1 Evaluation status as scientist/scholar

First evaluation: 2004 / Y2 scientific rating at the National Research Foundation

### 11.2 Research awards and prizes

None

### 11.3 Teaching awards and prizes

None

### 11.4 Artistic awards and prizes

None

## List of peers suitable to review my teaching and research outputs

### **Dr George Green**

Deputy CEO of the Water Research Commission  
Marumati Building  
c/o Frederika Street and 18th Avenue  
Rietfontein  
Pretoria  
Tel: +27-12-330-0340  
E-Mail: [georgeg@wrc.org.za](mailto:georgeg@wrc.org.za)

### **Dr J.L. Mc Gregor**

Senior Scientist  
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Victoria, Australia  
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Fax: +61 3 9239 4444  
[john.mcgregor@csiro.au](mailto:john.mcgregor@csiro.au)

## **Referees**

### **Dr Jonas Mphepya**

Acting CEO & General Manager: Innovations & Research  
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0001  
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Cel: +27 84 495 5683  
E-mail: [jonasmphepya@weathersa.co.za](mailto:jonasmphepya@weathersa.co.za)

### **Prof Jana Olivier** (served as acting Head of Geography)

Department of Environmental Sciences  
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## HIGHLIGHTS OF 2008/2009

**Prof C.J.deW. Rautenbach** serves as Chair of the Organising Committee of the annual conference of the South African Society for Atmospheric Sciences (SASAS) that took place at the University of Pretoria between 30 September and 1 October 2008. This was also an UP centenary celebration event.

**Prof C.J.deW. Rautenbach** present the talk “The influence of Marion Island Topography on the Hydrostatic General Circulation of the Southern Ocean” at the annual conference of the South African Society for Atmospheric Sciences (SASAS) on 1 October 2008.

**Prof C.J.deW. Rautenbach** was elected as President of the South African Society for Atmospheric Sciences (SASAS) at the annual SASAS conference in October 2008.

**Prof C.J.deW. Rautenbach** was elected as Council Member of the National Association of Clean Air (NACA) in September 2008.

**Prof C.J.deW. Rautenbach** was invited to serve as a Co-Lead Author for a Theme Plan that forms a core part of the National Science Plan on Global Change of the Department of Science and Technology (DST).

**Prof C.J.deW. Rautenbach** was invited to serve as co-lead author in the South African Second National Communication (SNC) to the UN Framework Convention on Climate Change (UNFCCC) under the The South African National Biodiversity Institute (SANBI) in partnership with the Department of Environmental Affairs and Tourism (DEAT).

**Prof C.J.deW. Rautenbach** was asked by the Department of Science and Technology (DST) to visit the University of Tokyo between 14-18 October 2008 with a JICA partner to negotiate with Japanese Authorities about a collaborative JICA/JST research project in the African Centre for Climate and Earth System Sciences (ACCESS).

**Prof C.J.deW. Rautenbach** was invited by the President of the American Meteorology Society (AMS) and attended a meeting on 13 January 2009 in Phoenix Arizona, USA, to establish an informal forum that brings together the leadership of the world’s approximately sixty-five meteorological societies.

**Prof C.J.deW. Rautenbach** gave a talk as invited opening keynote speaker at the Annual General Meeting of the South African Stud Book and Animal Improvement Association that took place in the C.R.Swart Auditorium of the University of the Free State on 22 October 2008.

**Prof C.J.deW. Rautenbach** gave a talk as invited opening keynote speaker during the Combined Conference of the SA Society of Crop Production, Soil Science Society of SA, SA Society for Horticultural Sciences and SA Weed Science Society at the University of Stellenbosch on 20 January 2009.

**CURRICULUM VITAE**  
**MR JAMES ADRIAAN HARRISON**

<b>Nationality</b>	South African
<b>Date of birth</b>	11 March 1953
<b>Employer</b>	self employed (JAH Environmental Consultancy)
<b>Position</b>	Environmental Consultant, Vertebrate Fauna Specialist
<b>Specialisation</b>	environmental consulting; faunal surveys and inventories
<b>Language</b>	first language English, reasonably fluent in Afrikaans
<b>Marriage status</b>	married with two children
<b>Qualifications</b>	Matric (Rondebosch Boys High) 1970 B.A. (Psychology, Archaeology; UCT) 1974 B.Sc. (Zoology, Microbiology; Rhodes) 1978 H.D.E.(PG) Sec. (UCT) 1979 B.Sc. Honours (Zoology; UCT) 1985 M.Sc. (Nature Conservation; Stellenbosch) 1993 M.A. (Creative Writing, UCT) 2001
<b>Employment history</b>	Taught high school biology and general science for six years (1980-86) at Muizenberg High School and Rondebosch Boys High School. Employed in July 1986 as Project Coordinator for the Southern African Bird Atlas Project (SABAP); saw the project through to completion in 1997. Subsequently Projects Manager for the Avian Demography Unit (ADU), University of Cape Town. Coordinated the Southern African Frog Atlas Project (1995-2004), and initiated the Southern African Reptile Conservation Assessment (SARCA). Also managed the Coordinated Avifaunal Roadcounts and Birds in Reserves Project, and edited the unit's journal, <i>Bird Numbers</i> . Carried out several consultancy contracts for the ADU, and continued this work as a freelance consultant from 2005. Resigned from the ADU at the end of 2007 and established own business as an environmental consultant.
<b>Research &amp; experience</b>	My main research interest was in surveying and mapping the biodiversity of South Africa and applying survey databases to conservation assessments. I have practical experience in conservation management through involvement on the Paarl Bird Sanctuary and Intaka Island advisory committees. Editing scientific writing is an area in which I have considerable experience. As an environmental consultant I have more than ten years of experience and have completed more than 60 reports. In this field I have a special interest in promoting an approach to development which provides for sustainable nature conservation alongside built environments.
<b>Major achievements</b>	John F.W. Herschel Medal of the Royal Society of South Africa, a gold medal presented to the team of editors of <i>The Atlas of Southern African Birds</i> for an "outstanding contribution to science in southern Africa, especially of a multidisciplinary nature", 1999.



## Publications

### Books

- HARRISON J.A., ALLAN D.G., UNDERHILL L.G., HERREMANS M., TREE A.J., PARKER V. & BROWN C.J. (eds). 1997. The atlas of southern African birds. Vols 1&2. BirdLife South Africa, Johannesburg.
- TAYLOR P.B., NAVARRO R.A., WREN-SARGENT M., HARRISON J.A. and KIESWETTER S.L. 1999. TOTAL CWAC Report: coordinated waterbird counts in South Africa, 1992-97. Avian Demography Unit, Cape Town.
- YOUNG D.J., HARRISON J.A., NAVARRO R.A., ANDERSON M.D. & COLAHAN B.D.(eds). 2003. Big Birds on Farms: Mazda CAR Report 1993–2001. Avian Demography Unit, Cape Town. 205 pp.
- MINTER L.R., BURGER M., HARRISON J.A., BRAACK H.H., BISHOP P.J. & KLOEPFER D. (eds). 2004. Atlas and Red Data book of the frogs of South Africa, Lesotho and Swaziland. SI/MAB Series no. 9. Smithsonian Institution, Washington, D.C.
- UNDERHILL L.G., TOMKOVICH P.S. & HARRISON J.A. (eds) 2006. The annual cycle of the Curlew Sandpiper *Calidris ferruginea*. International Wader Studies 19: 1-211. Cape Town: International Wader Study Group.

### Chapters in books

- HARRISON J.A. 1989. Atlassing as a tool in conservation, with special reference to the Southern African Bird Atlas Project. In: Huntley B.J. (ed.), Biotic diversity in southern Africa: concepts and conservation, pp. 157-169. Cape Town: Oxford University Press.
- PICKER M.D., HARRISON J.A. & WALLACE D. 1996. Natural hybridization between *Xenopus laevis laevis* and *X. gilli* in the south-western Cape Province, South Africa. Pp. 61-70. In: Tinsley R.C. & Kobel H.R. (eds). The biology of *Xenopus*. Oxford: Clarendon Press.
- HARRISON J.A. & UNDERHILL L.G. 1997. Introduction and methods. Pp. xliii-lxiv. In: Harrison J.A., Allan D.G., Underhill L.G., Herremans M., Tree A.J., Parker V. & Brown C.J. (eds). 1997. The atlas of southern African birds. Vols 1. BirdLife South Africa, Johannesburg.
- ALLAN D.G., HARRISON J.A. HERREMANS M., NAVARRO R.A. & UNDERHILL L.G. 1997. South African geography: its relevance to birds. Pp. lxxv-ci. In: Harrison J.A., Allan D.G., Underhill L.G., Herremans M., Tree A.J., Parker V. & Brown C.J. (eds). 1997. The atlas of southern African birds. Vols 1. BirdLife South Africa, Johannesburg.
- HARRISON J.A. 1997. Texts for the species listed below. In: Harrison J.A., Allan D.G., Underhill L.G., Herremans M., Tree A.J., Parker V. & Brown C.J. (eds). 1997. The atlas of southern African birds. Vols 1. BirdLife South Africa, Johannesburg.
- Hoopoe *Upupa epops*
  - Ashy Tit *Parus cinerascens*
  - Cape Rock Thrush *Monticola rupestris*
  - Sentinel Rock Thrush *Monticola explorator*
  - Shorttoed Rock Thrush *Monticola brevipes*
  - Mountain Chat *Oenanthe monticola*
  - Capped Wheatear *Oenanthe pileata*
  - Familiar Chat *Cercomela familiaris*
  - Tractrac Chat *Cercomela tractrac*
  - Sicklewinged Chat *Cercomela sinuata*
  - Karoo Chat *Cercomela schlegelii*

- Stonechat *Saxicola torquata*
- Anteater Chat *Mymecocichla formicivora*
- Buffstreaked Chat *Oenanthe bifasciata*
- Karoo Robin *Erythropygia coryphaeus*
- African Marsh Warbler *Acrocephalus baeticatus*
- Longbilled Crombec *Sylvietta rufescens*
- Pallid Flycatcher *Melaenornis pallidus*
- Greater Doublecollared Sunbird *Nectarinia afra*
- Dusky Sunbird *Nectarinia fusca*

And as second author:

- Southern Pochard *Netta erythrophthalma*
- Cape Turtle Dove *Streptopelia capicola*
- Laughing Dove *Streptopelia senegalensis*
- Namaqua Warbler *Phragmacia substriata*
- Blackheaded Canary *Serinus alario*

- HARRISON J.A. 2000. Statistical tables. In: Le Roux J. (comp.). The biodiversity of South Africa 2002: indicators, trends and human impacts. Struik, Cape Town.
- HARRISON J.A. 2003. Big birds on farms – the message. Pp. 15–24. In: Young D.J, Harrison J.A., Navarro R.A., Anderson M.D. & Colahan B.D.(eds). Big Birds on Farms: Mazda CAR Report 1993–2001. Avian Demography Unit, Cape Town.
- ALEXANDER G.J., HARRISON J.A., FAIRBANKS D.H. & NAVARRO R.A. 2004. Biogeography of the frogs of South Africa, Lesotho and Swaziland. Pp. 31–47. In: Minter L.R., Burger M., Harrison J.A., Braack H.H., Bishop P.J. & Kloepfer D. (eds). Atlas and Red Data book of the frogs of South Africa, Lesotho and Swaziland. SI/MAB Series no. 9. Smithsonian Institution, Washington, D.C.
- HARRISON J.A. 2004. *Breviceps acutirostris*, *Breviceps montanus*, *Breviceps rosei*. Pp. 170–171, 183–184, 188–189. In: Minter L.R., Burger M., Harrison J.A., Braack H.H., Bishop P.J. & Kloepfer D. (eds). Atlas and Red Data book of the frogs of South Africa, Lesotho and Swaziland. SI/MAB Series no. 9. Smithsonian Institution, Washington, D.C.
- HARRISON J.A. & MINTER L.R. 2004. *Breviceps gibbosus*. Pp. 177–180. In: Minter L.R., Burger M., Harrison J.A., Braack H.H., Bishop P.J. & Kloepfer D. (eds). Atlas and Red Data book of the frogs of South Africa, Lesotho and Swaziland. SI/MAB Series no. 9. Smithsonian Institution, Washington, D.C.
- MINTER L.R., HARRISON J.A., BURGER M. & BRAACK H.H. 2004. Introduction. Pp. 1–10. In: Minter L.R., Burger M., Harrison J.A., Braack H.H., Bishop P.J. & Kloepfer D. (eds). Atlas and Red Data book of the frogs of South Africa, Lesotho and Swaziland. SI/MAB Series no. 9. Smithsonian Institution, Washington, D.C.

#### **Papers and articles in journals and proceedings (in chronological order)**

- HARRISON J.A. 1987. The Southern African Bird Atlas Project. South African Journal of Science 83:400-401.
- UNDERHILL L.G., OATLEY T.B. & HARRISON J.A. 1991. The role of large scale data collection projects in the study of southern African birds. Ostrich 62: 124-148.
- HARRISON J.A. 1992. The southern African bird atlas project databank - five years of growth. South African Journal of Science 88: 410-413.
- HARRISON J.A., ALLAN D.G. & MARTINEZ P. 1992. The distribution and relative abundance of cranes in South Africa as assessed by bird atlas data. In: Porter D.J., Craven H.S., Johnson D.N. & Porter M.J. (eds), Proceedings of the First Southern African Crane Conference. Durban: Southern African Crane Foundation, pp. 79-81.

- UNDERHILL L.G., PRYS-JONES R.P., HARRISON J.A. & MARTINEZ P. 1992. Seasonal patterns of occurrence of Palaearctic migrants in southern Africa using atlas data. *Ibis* 134 Supplement 1: 99-108.
- NAVARRO R.A., HARRISON J.A., ALLAN D.G. & ZUCCHINI W. 1993. Correlating relative abundance and rainfall: analyzing time-series of checklists. In: Trevor Wilson, R. (ed.), *Proceedings of the Eighth P.A.O.C.: Birds and the African Environment; Burundi, October 1992*, pp. 379-388.
- BERRUTI A., HARRISON J.A. & NAVARRO R.A. 1994. Seasonal migration of terrestrial birds along the southern and eastern coasts of southern Africa. *Ostrich* 65(2): 54-65.
- HARRISON J.A., ALLAN D.G. & VAN HENSBERGEN H.J. 1994. Automated annotation of species lists: an aid in environmental consultancy. *Ostrich* 65: 316-328.
- HARRISON J.A. & NAVARRO R.A. 1994. Modelled reporting rates as indices of changes in relative abundance with altitude and season. In: Hagemerijer E.J.M. & Verstrael T.J. (eds), *Bird Numbers 1992: distribution, monitoring and ecological aspects. Proceedings of the 12th International Conference of IBCC and EOAC, Noordwijkhout, The Netherlands. Statistics Netherlands, Voorburg/Heerlen & SOVON, Beek-Ubbergen*. pp. 607-618.
- HARRISON J.A. & MARTINEZ P. 1995. Measurement and mapping of avian diversity in southern Africa: implications for conservation planning. *Ibis* 137: 410-417.
- HARRISON J.A., ALLAN D.G., UNDERHILL L.G. & OATLEY T.B. 1996. The Avian Demography Unit: tracking bird populations in a changing South Africa. *South African Journal of Science* 92: 14-16.
- ALLAN D.G., HARRISON J.A., NAVARRO R.A., VAN WILGEN B.W. & THOMPSON M.W. 1997. The impact of commercial afforestation on bird populations in Mpumalanga Province, South Africa – insights from bird-atlas data. *Biological Conservation* 79(2-3): 173-186.
- GREGORY R.D., HARRISON J.A., GRIFFIOEN P. & HAGEMEIJER W.E.J. 1999. Large scale atlas and census studies in conservation science. In: Adams, N.J. & Slotow, R.H. (Eds). *Proceedings of the 22nd International Ornithological Congress, Durban. Johannesburg: BirdLife South Africa*. pp. 3194.
- MINTER L.R., BURGER M. & HARRISON J.A. 2000. Progress and interim results of the Southern African Frog Atlas Project. *African Journal of Herpetology* 49: 3–8.
- HARRISON J.A., UNDERHILL L.G., YOUNG D.J. & ANDERSON M. 2000. @@@@ Pp. 56–61. 12th South African Crane Working Group Workshop. 22–23 November 2000.
- YOUNG D.J. & HARRISON J.A. 2000. The CAR technique for censusing cranes. pp. 62–72. 12th South African Crane Working Group Workshop. 22–23 November 2000.
- HARRISON J.A. 2002. Red Data – why and how. In: *The state of South Africa's species*. Pp. 211-220. Proceedings of a conference held at the Rosebank Hotel, Johannesburg, September 2001.
- BURGER M. & HARRISON J.A. 2002. The state of South Africa's amphibia. In: *The state of South Africa's species*. Pp. 117-125. Proceedings of a conference held at the Rosebank Hotel, Johannesburg, September 2001.
- YOUNG D.J. & HARRISON J.A. 2002. Population monitoring results for the Blue Crane, *Anthropoides paradiseus*, from Coordinated Avifaunal Roadcounts (CAR). Appendix 7. In: McCann K., Morrison K., Byers A., Miller P. & Friedmann Y. (eds). *Blue crane (Anthropoides paradiseus). A Population and Habitat Viability Assessment Workshop. 1–4 October 2002, Villiersdorp, South Africa. Final Workshop Report. Conservation Breeding Specialist Group, SCC/IUCN, Apple Valley, MN, USA*.
- HARRISON J.A., MINTER L.R. & BURGER M. 2004. Atlas and Red Data book for frogs completed. *S. Afr. J. of Sci.* 100: 11–13.

**Articles in popular publications (in chronological order)**

- HARRISON J.A. 1986. The Southern African Bird Atlas Project. *Bokmakierie* 38(4): 98-99.
- HARRISON J.A. 1987. The Southern African Bird Atlas Project. *African Wildlife* 40(6): 260.
- HARRISON J.A. 1987. Birds of a feather. *Conserva* 2(3): 13-15.
- HARRISON J.A. 1988. Become an atlasser and see the world! *Bokmakierie* 40(1): 30-32.
- ALLAN D. & HARRISON J. 1989. Forest or Steppe Buzzard? *SABAP News* 7: 10.
- HARRISON J.A. 1990. The value of atlassing: distributions and relative abundance. *Birding in Southern Africa* 42(4): 109-116. Also in *Conserva* 6: 10-13.
- HARRISON J.A. 1991. The value of atlassing: the seasonality of migratory birds. *Birding in Southern Africa* 43(1): 4-6.
- HARRISON J.A. & OATLEY T.B. 1991. The value of atlassing: local seasonal movements. *Birding in Southern Africa* 43(3): 66-68.
- HARRISON J.A. 1993. What Bird Atlassing Means for Conservation. *Our Living World*. January: 8-9.
- HARRISON J. 1995. The Atlas of southern African birds. *Birding in Southern Africa* 47(2): 42-45.
- HARRISON J. 1995. The Birds in Reserves Project (BIRP). *Birding in Southern Africa* 47(2): 42.
- HARRISON J.A. & ALLAN D.G. 1995. The value of atlassing: solving real-world problems. *Birding in Southern Africa* 47(4): 114-116.
- HARRISON J.A. & ALLAN D.G. 1995. The value of atlassing: solving real-world problems. *Birding in Southern Africa* 47(4): 114-116.
- HARRISON J.A. 1997. Southern African bird atlas – messages for conservation. Vision: Annual review of the ten countries of southern Africa. Vol. 5: Environment and ecotourism: 62-67.
- HARRISON J.A. 1998. Getting started. In: Harrison, J.A. & Burger, M. (eds). 1998. Frogs and frog atlassing in southern Africa. ADU Guide 4, pp. 5-12.
- HARRISON J.A. 1998. Maps, grid cells and coordinates. In: Harrison, J.A. & Burger, M. (eds) 1998. Frogs and frog atlassing in southern Africa. ADU Guide 4, pp. 13-16.
- HARRISON J.A. 1998. Breeding strategies in southern African frogs. In: Harrison, J.A. & Burger, M. (eds) 1998. Frogs and frog atlassing in southern Africa. ADU Guide 4, pp. 32-35.
- HARRISON J.A. 1998. Domestic frogs. In: Harrison, J.A. & Burger, M. (eds). 1998. Frogs and frog atlassing in southern Africa. ADU Guide 4, pp. 67-68.
- HARRISON J.[A.] & UNDERHILL L.[G.] 2000. Blouvillei: development is for the birds. *Africa – Birds & Birding* 5: 43-47.
- HARRISON J.A. & MACIVER M. 2000. The constructed heronry at Blouvillei, Century City, Cape Town. *Bird Numbers* 9(1): 38-42.
- HARRISON J.A., MACIVER M. and WEYERS D. 2001. Breeding at constructed heronries at Blouvillei, Western Cape. *Bird Numbers* 10(2): 38-39.
- HAREBOTTLE D.M. & HARRISON J.A. 2001. Changes in distribution and abundance of waterbirds in South Africa. *Bird Numbers* 10: 47-51.
- HARRISON J.A. & BURGER M. 2001. Threatened riches. South Africa's frogs – a conservation challenge. *African Wildlife* 55(2): 24-27.
- HARRISON J.A., MACIVER M. and WEYERS D. 2003. Weyers Islands: a successful design for constructed heronries. *Bird Numbers* 12(2): 40-43.
- BURGER M. & HARRISON J.A. 2004. Southern African Frog Atlas Project completed! *Froglog* 62: 1-2.
- HARRISON J.A., HAREBOTTLE D.M., WHEELER M. & YOUNG D. 2004. ADU celebrates 10+ years of bird monitoring. *Bird Numbers* 13(2): 4-5.
- HARRISON J.A. 2005. Sticks 'n stones. *Africa – Birds & Birding* 10(2): 52-59.
- HARRISON J.A. 2005. Amphibians: dwindling denizens of damp places. *African Wildlife* 59: 32-34.
- HARRISON J.A. 2006. The Southern African Reptile Conservation Assessment and its virtual museum. *African Herp News* 39: 5-7.

- YOUNG D. & HARRISON J.A. 2004. Big birds on farms – CAR tracks the changes. p. 8. Northern Natal Farmer. October.
- HARRISON J.A. 2008. Fauna of Rondebosch Common: reptiles and amphibians. In: Rondebosch Common. The Friends of Rondebosch Common, Rondebosch.

**Research reports** (in chronological order)

- HARRISON J.A. 1993. Counting Waterbirds. South African Wetlands 4: 9-11.
- HARRISON J.A. 1994. A report on an analysis of avian diversity and conservation in the Karoo biome. For a SANF workshop. ADU, UCT.
- ALLAN D.G., HARRISON J.A. and NAVARRO R.A. 1995. The impact of commercial afforestation on bird populations in the Eastern Transvaal Province of South Africa - insights from bird atlas data. ADU Research Report 11.
- ALLAN D.G., HARRISON J.A., NAVARRO R.A. & MARTINEZ P. 1995. The Redbilled Quelea and non-target birds - insights from Bird Atlas data. ADU Research Report No. 9.
- VELASQUEZ C.R., ALLAN D.G. & HARRISON J.A. 1995. Birds of Yzerfontein Pan and surrounding areas. ADU Research Report 10.
- HARRISON J.A., NAVARRO R.A. & BARNES K.N. 1997. An analysis of the avifauna of Gauteng. ADU Research Report 22.
- TAYLOR P.B. & HARRISON J.A. 1997. Design and management of the Blouville wetlands, at Century City, for wetland birds. ADU Research Report 25.
- HARRISON J.A., SPOTTISWOODE C.N. & NAVARRO R.A. 1999. Bird monitoring at Blouville, Century City, February-December 1998. ADU Research Report 30.
- BURGER M. & HARRISON J.A. 2000. Occurrence of mammals, reptiles and amphibians at Blouville, Century City, and recommendations for management. Avian Demography Unit Research Report No. 37.
- HARRISON J.A., NAVARRO R.A. & SPOTTISWOODE C.N. 2000. Bird monitoring at Blouville, Century City, March 1999–January 2000. ADU Research Report 36.
- HARRISON J.A., BURGER M., MINTER L.R., DE VILLIERS A.L., BAARD E.H.W., SCOTT E., BISHOP P.J. & ELLIS S. 2001. Conservation Assessment and Management Plan for Southern African Frogs. Final Report. IUCN/SSC Conservation Breeding Specialist Group. Apple Valley, MN.
- HARRISON J.A. & HAREBOTTLE D.M. 2001. Gull and Ibis breeding colonies at a constructed wetland, Western Cape. Bird Numbers 10(2): 40-41.
- HARRISON J.A., NAVARRO R.A. & HAREBOTTLE D.M. 2001. Bird monitoring at Blouville, Century City, January 2000–January 2001. ADU Research Report 43.
- HARRISON J.A. & MACIVER M. 2003. Bird monitoring in Intaka Island during 2002/03, and an overview of six years of bird monitoring. ADU Research Report 52.
- HAREBOTTLE D.M., HARRISON J.A. & NAVARRO R.A. 2004. Conservation of birds in Gauteng. Parts 1 & 2. ADU Research Report 60a & 60b.
- HARRISON J.A., MACIVER M. & FREEMAN B. 2004. Bird monitoring on Intaka Island during 2003/04, and an overview of seven years of bird monitoring. ADU Research Report 63.
- HARRISON J., MACIVER M. & FREEMAN B. 2005. Bird monitoring at Blouville, Century City, March 2004–February 2005. ADU Research Report 69.
- BRANCH W.R., TOLLEY K.A., CUNNINGHAM M., BAUER A.M., ALEXANDER G., HARRISON J.A., TURNER A.A. & BATES M.F. 2006. A plan for phylogenetic studies of southern African reptiles. Biodiversity Series #5, SANBI, Pretoria.

**Consultancy reports** (in chronological order)

- ALLAN D.G. & HARRISON J.A. 1994. Report on potential avian sensitivity to powerline construction in an area of Natal. ADU Research Report No. 4.
- ALLAN D.G. & HARRISON J.A. 1994. Report on potential avian sensitivity to the construction of a powerline between De Aar and Beaufort West. ADU Research Report No. 7.
- HARRISON J.A. 1998. Avifauna of the Secunda area: an analysis of sensitivity and possible impacts of mining developments. ADU Research Report 28.
- HARRISON J.A. 1998. Avifauna of Bushbuckridge: An analysis of sensitivity and possible impacts of new dams and pipelines. ADU Research Report 29.
- HARRISON J.A. & HAREBOTTLE D.H. 1999. Survey of the avifauna of Ghaamsberg. ADU Research Report 35.
- HARRISON J.A. & NAVARRO R.A. 2000. Scoping report on the potential impact on birds of a new 400 kV powerline in the Northern Cape. ADU Research Report 38.
- HARRISON J.A. 2002. Scoping survey of the birds and amphibians of Rooisands Nature Reserve, Western Cape. ADU Research Report No. 46. 9 pp.
- HARRISON J.A. 2003. Report on proposed developments at Rooisands Nature Reserve, with special reference to birds and amphibians. ADU Research Report No. 48. 7 pp.
- HARRISON J.A. & McDOWELL C.R. 2003. A list of recommended indigenous plants for use in the gardens of greater Cape Town. ADU Research Report No. 49. 18 pp.
- HARRISON J.A. 2003. Scoping report on the birds and amphibians on land owned by the National Ports Authority, Saldanha Bay. ADU Research Report 50. 7 pp.
- HARRISON J.A. 2003. Development of Arabella Golf Estate, Phase 2: assessment of impacts on vertebrate fauna. ADU Research Report 54. 22 pp.
- HARRISON J.A. 2004. Development of Arabella Golf Estate, Phase 2: Second assessment of impacts on vertebrate fauna. ADU Research Report 61. 32 pp.
- HARRISON J.A. 2004. Development of Arabella Golf Estate, Phase 2: A survey of the amphibians in two seasonal ponds. ADU Research Report 62.
- HARRISON J.A. 2004. Recommended mitigatory measures for invertebrates at Arabella, Phase 2. Report for Dennis Moss Partnership, Stellenbosch. 7 pp.
- HARRISON J.A. 2004. Faunal study of the development site at Lagoonbay Lifestyle Estate, Glentana. ADU Research Report 65. 28 pp.
- HARRISON J.A. 2005. The potential impacts of a residential development in Noordhoek on the Western Leopard Toad *Bufo pantherinus*. Report for Urban Space Property Development Pty Ltd., Cape Town. 4 pp.
- HARRISON J.A. 2005. An assessment of Erf 647, Noordhaven, as habitat of the Western Leopard Toad *Bufo pantherinus*. Report for Urban Space Property Development Pty Ltd., Cape Town. 17 pp.
- HARRISON J.A. 2005. Environmental constraints on development of a site at Landskroon, with special reference to fauna. Report for Dennis Moss Partnership, Stellenbosch. 20 pp.
- HARRISON J.A. 2005. An assessment of sensitive habitats on De Zalze golf estate, Stellenbosch: constraints and opportunities for development extensions. Report for Dennis Moss Partnership, Stellenbosch. 25 pp.
- HARRISON J.A. 2005. An assessment of habitats on Devon Vale golf estate, near Stellenbosch: constraints and opportunities for development extensions. Report for Dennis Moss Partnership, Stellenbosch. 28 pp.
- HARRISON J.A. 2005. Assessment of the proposed Lagoonbay Lifestyle Estate development at Glentana: impacts on fauna. Report for Hilland Associates, George. 16 pp.
- HARRISON J.A. 2005. An assessment of habitats on Liebestraum Farm, Hoekwil: constraints and opportunities for development. Report for Dennis Moss Partnership, Stellenbosch. 29 pp.
- HARRISON J.A. 2005. Protocol for fixed-point photographic monitoring at Intaka Island. A report to the Blouville Environmental Committee. 2 pp.

- WILLIAMS A.J., HARRISON J.A. & HAREBOTTLE D. 2005. Specialist study on birds for the Strandfontein section of the proposed N21 (R300) Cape Town Ring Road Toll Project, and its alternative routes. ADU Research Report 67.
- HARRISON J.A. 2006. A concept development plan for Reins Private Nature Reserve: faunal constraints. Report for Dennis Moss Partnership, Stellenbosch. 30 pp.
- HARRISON J.A. 2006. An assessment of a development plan in Steenberg with respect to the Endangered Western Leopard Toad: potential impacts, constraints and recommended mitigations. Report for for CNdV africa, Cape Town. 28 pp.
- HARRISON J.A. 2006. Koeël Bay, Cape Peninsula: scoping report on fauna and faunal ecology. Report for Seaton Thomson and Associates, Pretoria. 21 pp.
- HARRISON J.A., BURGER M., DORSE C., ROTHWELL E. & NAVARRO R.A. 2006. Report on a survey of the Western Leopard Toad in Noordhoek, Cape Peninsula. Report for Noordhoek Conservancy and Noordhoek Environmental Action Group, Cape Town. 22 pp.
- HARRISON J.A., MACIVER M., MBEWU S., WHEELER W., FREEMAN B. and MAGAZI T. 2006. Bird monitoring on Intaka Island during 2005/06, and an overview of nine years of bird monitoring. Report to Blouvlei Environmental Committee. 36 pp.
- HARRISON J.A. 2006. Proposed development at Romansbaai, Gansbaai: impact assessment for fauna and faunal ecology. Report for Doug Jeffery & Associates, Klapmuts, on behalf of Pinnacle Point, Cape Town. 15 pp.
- HARRISON J.A. 2006. Erf 60, Simonstown (Glencairn Heights): baseline survey and impact assessment of fauna and faunal ecology. Report for Andre van Der Spuy Environmental Consultants, Constantia. 24 pp.
- HARRISON J.A. 2006. Assessment of development on portions 19 and 20, Noordhoek, with respect to the Western Leopard Toad. Report for Management Services, BKS, Bellville. 12 pp.
- HARRISON J.A. 2006. Portions of farms 104 and 108, Jacobsbaai: baseline survey of fauna and faunal ecology. Report for Doug Jeffery Environmental Consultants (Pty) Ltd., PO Box 44, Klapmuts 7625, on behalf of Jacobsbaai Bio-diversity Reserve. 27 pp.
- HARRISON J.A. 2006. Portion 51 of farm 485, Stilbaai: baseline survey of fauna and faunal ecology. Report for Doug Jeffery & Associates, Klapmuts. 27 pp.
- HARRISON J.A. 2007. St Helena Bay SDI: baseline survey of fauna and faunal ecology with recommendations for layout and land use. Report for Dennis Moss Partnership, Stellenbosch, on behalf of Euroconsult (EC Group).
- HARRISON J.A. 2007. AECl, the Strand: Baseline survey of fauna and faunal ecology for Phase 2 development. Report for Heartland, Strand. 32 pp.
- HARRISON J.A. 2007. Baseline and impact assessment of the vertebrate fauna on an ACSA site, Precinct 3, Cape Town International Airport. Report for ACSA. 25 pp.
- HARRISON J.A. 2007. Development at Annandale: impact assessment for vertebrate fauna. Report for Doug Jeffery Environmental Consultants, Klapmuts. 21 pp.
- HARRISON J.A. 2007. Erf 28, Birkenhead: impact assessment for fauna and faunal ecology. Report for Doug Jeffery Environmental Consultants (Pty) Ltd., Klapmuts, on behalf of Great White Ltd. 17 pp.
- HARRISON J.A. 2007. Boschendal Estate, Western Cape: second draft scoping report on vertebrate fauna. Report for Doug Jeffery & Associates on behalf of Boschendal Estate (Pty) Ltd.
- HARRISON J.A. 2007. PBMR DPP environmental impact report: specialist study: vertebrate fauna. Report for ARCUS GIBB on behalf of Eskom. 46 pp.
- HARRISON J.A. 2007. Management of the Western Leopard Toad in a built environment. Report for the Conservation Committee, Bokkemanskloof, Hout Bay. 11 pp.
- HARRISON J.A. 2007. An opinion on the impacts of a proposed concert on the fauna of Kenilworth Racecourse. Report for Big Concerts International. 4 pp.

- HARRISON J.A. 2007. Amphibian fauna of Cape farm 953-12, Sunnydale. Report for the Freshwater Study Group. 7 pp.
- HARRISON J.A. 2007. Comments on development of a park in Meadowridge: fauna and related issues. Report for Doug Jeffery and Associates, Klapmuts. 7 pp.
- HARRISON J.A. 2007. Aspect site, Muizenberg east: recommendations on ecological corridors. Report for MSP Developments, Bellville. 13 pp.
- HARRISON J.A. 2007. Philippi farms: baseline report on vertebrate fauna. Report for The Environmental Partnership, Cape Town, on behalf of Urban Dynamics, Bellville. 44 pp.
- HARRISON J.A. 2007. Strategic biodiversity and heritage assessment of Jacobsbaai Tortoise Reserve: motivation to declare a protected area. Report for Jacobsbaai Tortoise Reserve Pty (Ltd). 25 pp.
- HARRISON J.A. 2007. Frogs at Worcester Dam. Report for Freshwater Consulting Group, Cape Town. 2 pp.
- HARRISON J.A. 2008. Opinion on proposed Paardevlei interchange at AECI: fauna perspective. 15 pp. Report for Heartland, Somerset West, c/o Doug Jeffery & Associates, Klapmuts, Cape Town. JAH Environmental Consultancy, Plumstead.
- HARRISON J.A. 2008. Review of specialist fauna report for "Amanzi" development, Uitenhage. 5 pp. Report for CSIR, Stellenbosch. JAH Environmental Consultancy, Plumstead.
- HARRISON J.A. 2008. Development at Annandale: impact assessment for vertebrate fauna. 23 pp. Report for Doug Jeffery & Assoc., Klapmuts. JAH Environmental Consultancy, Plumstead.
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- HARRISON J.A. 2008. Development at Protea Ridge, Kommetjie: baseline assessment of vertebrate fauna. 19 pp. Report for Cape EAPrac, Klapmuts, on behalf of The Kommetjie Estates Ltd. JAH Environmental Consultancy, Plumstead.
- HARRISON J.A. & BURGER M. 2008. Development at Protea Ridge, Kommetjie: further baseline information on amphibians. 11 pp. Report for Cape EAPrac, Klapmuts, on behalf of The Kommetjie Estates Ltd. JAH Environmental Consultancy, Plumstead.
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- HARRISON J.A. 2008. Comment on the Western Leopard Toad at a proposed development in Fish Hoek. 7 pp. Report for Mike Nevin, Cape Town. JAH Environmental Consultancy, Plumstead.
- HARRISON J.A., BURGER M. & STOFFBERG S. 2008. Environmental impact assessment for the proposed nuclear power station ('Nuclear 1') and associated infrastructure: terrestrial vertebrate fauna. 143 pp. Report for Arcus Gibb, Rivonia, and Eskom. JAH Environmental Consultancy, Plumstead.

**Conference presentations and posters (in chronological order)**



- HARRISON J.A. & OATLEY T.B. 1987. Distribution of forest birds in the eastern Cape. Birds of the Evergreen Forests Symposium; Wilderness, 7-10 September 1987.
- OATLEY T.B. & HARRISON J.A. 1987. The Southern African Bird Atlas Project: goals and organization. Birds of the Evergreen Forest Symposium; Wilderness, 7-10 September 1987.
- HARRISON J.A. 1990. The Southern African Bird Atlas Project - Interim results. Symposium on Longterm and Single Species Bird Studies; Bloemfontein, 2-5 April 1990.
- HARRISON J.A. 1995. The SAOS/ADU partnership projects. Presented at the Southern African Ornithological AGM, Itala Game Reserve, 8-10 September 1995.
- HARRISON J.A. 1995. Distribution of cranes in southern Africa (poster). Workshop of the S.A. Crane Foundation, Arniston, October 1995.
- UNDERHILL L.G., HERREMANS M., HARRISON J.A. & NAVARRO R.A. 1997. Palearctic migrants in southern Africa: results from the Southern African Bird Atlas Project. First Meeting of the European Ornithological Union. Bologna, Italy.
- BURGER M., NAVARRO R.A. and HARRISON J.A. 2003. Southern African Frog Atlas Project (poster). ZSSA Conference, University of Cape Town.
- HARRISON J.A. 2003. The status of South African frogs (oral presentation). ZSSA Conference, University of Cape Town.
- HARRISON J.A., ALEXANDER G.J., BAARD E.H.W., BATES M., BRANCH W.R., CUNNINGHAM M., ERASMUS B., FODEN W., FRIEDMANN Y. & A. TURNER 2004. A proposed conservation assessment and atlas for the reptiles of South Africa, Lesotho and Swaziland. Seventh Herpetological Association of Africa Symposium. 6-9 October 2004. Bayworld, Port Elizabeth.
- HARRISON J.A. 2004. A pilot analysis of recovery data for African-Eurasian waterbirds. Waterbirds around the World Conference. 3-8 April 2004, Edinburgh, Scotland.
- HARRISON J.A., ERASMUS B., MARITZ B., BURGER M. & BRANCH W.R. 2005. (poster). Southern African Reptile Conservation Assessment (SARCA). Fifth World Herpetological Congress, Stellenbosch.
- MECENERO S., HARRISON J., STAUDE, H., COETZER B., HENNING G. & KRÜGER M. 2005. Butterfly conservation assessment and atlas project for South Africa: A proposal. Proceedings of the 15th Entomological Congress, Rhodes University, Grahamstown (South Africa), 10-13 July 2005.
- MECENERO S., HARRISON J., STAUDE, H., COETZER B., HENNING G. & KRÜGER M. 2005. Butterfly conservation assessment and atlas project for South Africa: A proposal. 2005 Conference of the Lepidopterist's Society of Africa, Onderstepoort (South Africa), 6-7 August 2005.
- HARRISON J.A. 2008. Citizen science: expanding scientific capacity. WA Biodiversity and Climate Change Scientific Forum. 5 June 2008, Perth, Western Australia.
- HARRISON J.A. 2008. Citizen science in biodiversity monitoring. Citizen Science for Biodiversity Monitoring Forum. 7 June 2008, Conservation Council of WA, Perth, Western Australia.

### **Other**

- HARRISON, J.A. 1986. Southern African Bird Atlas Project: Instructions. Southern African Bird Atlas Project, University of Cape Town.
- HARRISON, J.A. 1988. SABAP Instructions Booklet. Southern African Bird Atlas Project, University of Cape Town.
- HARRISON, J.A. (ed.) 1987-93. SABAP News 1-14. SABAP, UCT.
- HARRISON J.A. 1995. Birds in Reserves Project: Instructions. ADU Guide No. 1. Avian Demography Unit, UCT.

- ALLAN D.G., HARRISON J.A., UNDERHILL L.G., HERREMANS M. & HITCHCOCK W.A. 1998. The nest record card scheme. ADU Guide 3 (Second edition).
- HARRISON J.A. & BURGER M. (eds). 1998. Frogs and frog atlasing in southern Africa. ADU Guide 4. (First edition).
- HARRISON J.A. & BISHOP P. 1995-1997. Southern African Frog Atlas Project. Information Sheets Nos 1-4. ADU, UCT.
- HARRISON J.A. (ed.) 1993-2003. Bird Numbers, volumes 1-13. ADU, UCT.
- HARRISON J.A. 2004-2006. Four educational modules for Intaka Island website. [www.intaka.co.za](http://www.intaka.co.za)
- BURGER M. & HARRISON J.A. 2005-2006. Nine SARCA newsletters. [www.reptiles.sanbi.org](http://www.reptiles.sanbi.org)



# Council for Geoscience

## Curriculum Vitae

### Johann Neveling

**Family Name:** Neveling  
**First Name/s:** Johann  
**Date of Birth:** 02 September 1972  
**Nationality:** South Africa  
**Civil Status:** Single  
**Profession:** Geologist

**Contact Address:** Council for Geoscience, Private Bag X112, Pretoria, 0001, South Africa  
 E-mail: [jneveling@geoscience.org.za](mailto:jneveling@geoscience.org.za)

#### Education:

Years	College/University	Degrees obtained
2009	University of Pretoria	MBA
2003	University of the Witwatersrand	PhD Thesis title: <i>Biostratigraphic and sedimentological investigation of the contact between the Lystrosaurus and Cynognathus Assemblage Zones (Beaufort Group: Karoo Supergroup).</i>
1994	University of Stellenbosch	BSc. Hons
1993	University of Stellenbosch	BSc.
<b>Courses and excursions</b>	<b>Geology of southern African coal, oil and gas deposits</b> , GSSA Professional programs, 2006.	

Language Skills:	Reading	Speaking	Writing
English:	Excellent	Excellent	Excellent
Afrikaans:	Excellent	Excellent	Excellent

#### Employment Record:

Council for Geoscience, Pretoria, South Africa: 1995-2008

1995-1999:	Junior Scientist
1999-2003:	Scientist
2004-2007:	Senior Scientist
2007-present:	Specialist Scientist
2007/11 – 2008/01:	Acting Unit Manager (Central Regions Unit, CGS)
2008/02 – present:	Technical Manager – NSIP

### **Membership of Professional Bodies:**

Member:	South African Council for Natural Scientific Professions (SACNASP)
Member:	Geological Society of South Africa (2007 – present)
Member:	Geological Society of America (2008 - present)
Member:	Palaeontological Society of Southern Africa (1994 – present)
	Executive Committee (1998 - present)
	President: (2008 – present)
Member:	S.A.C.S. Task Group for the Karoo Supergroup
Secretary	S.A.C.S. Biostratigraphic Working Group

### **Key areas of specialisation:**

- Sedimentology
- Stratigraphy (biostratigraphy and lithostratigraphy)
- Basin Development
- Vertebrate Palaeontology

### **Relevant Experience:**

- More than 15 years' experience in integrated stratigraphic research in the Karoo Basin of South Africa, which included integrating lithostratigraphic, biostratigraphic, sedimentological and palaeontological data and stratigraphic and basin modelling.
- Additional research on:
  - Middle to Late Permian sub-aqueous and fluvial deposits in the Karoo of South Africa,
  - Permo-Triassic mass-extinction studies,
  - Holocene alluvial fan deposits,
  - Triassic-Jurassic terrestrial deposits in central South Africa and
  - Coal deposits of Mozambique
  - Interbasinal correlation of rock sequences across national boundaries, focussing on the tectonic framework and basin development
- Project management of an international collaborative project involving three institutions and two universities from the countries of Botswana, Namibia and South Africa (2005 – present).

### **Project management experience:**

- 2005 - Present: Project Manager for Tri-Nations Karoo correlation project; a collaborative research project involving participants from Botswana, Namibia and South Africa.
- 2007 - Present: Technical Project manager of Seismic Hazard Assessment for nuclear sites, South Africa.

### **Publications:**

15 papers in peer-reviewed journals, 2 CGS publications, more than 40 papers published in conference proceedings, as well as several, internal technical reports.

### **Reviewing:**

- Fifteen papers submitted for publication to scientific journals
- An application for postdoctoral fellowship submitted the NRF – 2004

- External examiner for the Honours Class of the Bernard Price Institute for Palaeontological Research (University of the Witwatersrand): 2004-2008
- External examiner for the Geology students at the University of the Johannesburg: 2008 – 2009.
- NRF Peer Reviewer – 2007
- Tender Committee of the Maloti Drakensberg transfrontier Project and National Parks Board reviewing tenders for a Dinosaur Interpretation Centre: 2006.

## CURRICULUM VITAE

## Environmental

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Company	Arcus GIBB
Name	<b>Jaana-Maria BALL</b>
Nationality	South African
Date of birth	22.12.1969
Profession	Environmental Scientist and Botanist/MBA
Position	Director
Specialisation	Project management, integrated environmental management including environmental impact assessments, environmental management programmes, botanical investigations, revegetation and rehabilitation programmes, integrated development planning; public facilitation, environmental auditing; and public private partnership advisory services
Start date with Arcus GIBB	1997 – Permanent full-time staff member

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### Key experience

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An environmental scientist with a Masters Degree in Business Administration and with 16 years of experience, Jaana-Maria Ball specialises in various environmental disciplines:

Her key experience includes:

- **Business administration and development** providing leadership and management of two business units (Environmental and Support Services) including strategic planning, financial performance, workload and resource planning, human resource management, quality management, review of projects and proposals, quality management and administration. Environmental Services comprises integrated environmental planning, hydrological and waste management services. Support services comprises human resources, information technology and marketing services
- **Project management** of various medium and large-scale infrastructural and environmental projects
- **Environmental advisory services and strategic environmental management** including Strategic Environmental Assessments and environmental scans
- **Environmental impact assessment (EIA)** of small, medium and large-scale infrastructure projects, including public participation processes
- **Environmental management programmes (EMP)** for the construction and operational phases of infrastructure developments
- **Environmental sensitivity and land-use suitability analyses** for various projects and biomes
- **Environmental management programme reports (EMPR) and mining permit applications** for borrow areas and mines in terms of the Mineral and Petroleum Resources Development Act of 2002
- **Vegetation studies** for ecologically sensitive areas within the Fynbos, Afromontane and Succulent Karoo Biomes
- **Rehabilitation and landscape plans** for various developments, particularly mining operations
- **Environmental auditing** including due-diligence, ISO 14001, legal compliance and waste audits
- **Integrated development planning (IDP)** including the management, facilitation and development of integrated development plans

- **Integrated Water Use Licensing Applications and General Authorisations for Water Use** to meet the requirements of the Department of Water Affairs and Forestry, and
  - **Public Private Partnership Advisory Services** in the procurement and delivery of infrastructure
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**Qualifications and Registrations/Certifications**

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Bachelor of Science in Botany and Zoology : University of Cape Town, 1990  
Bachelor of Science (Honours) in Botany : University of Cape Town, 1991  
Master of Science in Botany (Ecology) : University of Cape Town, 1995  
Integrated Environmental Management - Theory and Practice : University of Cape Town, 1996  
Business Management Diploma : Damelin College, 1996  
Project Management (post-graduate course) : University of Cape Town, 2001  
Master of Business Administration (MBA) : University of Cape Town, 2003 (Full-time) and ESADE (Barcelona, Spain) (Full-time)  
Professional Member of the South African Council for Natural Scientists, 1998 to date  
PriSciNat No : 400049/98  
Professional Member, South African Institute of Ecologists and Environmental Scientists, 1998 to date  
Professional Member, South African Association of Botanists, 2000 to date  
Certified Environmental Impact Assessment Practitioner, Interim Certification Board, 2006 (application in process)  
Associate Environmental Auditor with Institute of Environmental Management and Assessment, 2006 (registration in process)

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**Career summary**


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- Oct 2009  
Present      **Arcus GIBB** – Discipline Leader and Director: Environmental Services; Organisational Manager Environmental Services North; Environmental Technical Director; Director: Systems Efficiencies; North Regional Co-ordinator; PPP Advisory Services; Corporate Strategy Roll Out Team
- Jan 2008 to  
Sept 2008      **Arcus GIBB** – Discipline Leader and Director: Environmental Services; Organisational Manager Environmental Services North; Environmental Technical Director; Director: Support Services (IT, HR, Marketing, Knowledge Management); PPP Advisory Services; Corporate Strategy Roll Out Team
- Oct 2006 to  
Dec 2007      **Arcus GIBB** – Discipline Leader and Director: Environmental Services; Director; Support Services (IT, HR, Marketing); PPP Advisory Services; Committee Member: Arcus GIBB Employment Equity Committee; Head: Arcus GIBB Corporate Strategy Roll Out Team; Chair: Arcus GIBB Remuneration Committee; Member: Arcus GIBB Bursary Committee
- April 2005 to  
Sept 2006      **Arcus GIBB** – Director; National Group Manager of Environmental Services Division, Member: Arcus GIBB Operational Management Team; Member: Arcus GIBB Employment Equity Committee, PPP Advisory Services
- April 2004 to  
April 2005      **Arcus GIBB** – Senior Associate; National Group Manager of Environmental Services Division, Member of Operational Management Team, PPP Advisory Services
- Jan 2003 to  
April 2004      **UCT and ESADE's (Barcelona, Spain) Business School's Full-time Master of Business Administration (MBA) and Exchange Programme**
- April 2002 to  
Jan 2003      **Arcus GIBB** – Associate; Division Manager of Environmental Services Division Cape Town; Business Development Manager, Southern Region
- Jan 2000 to  
Mar 2002      **Arcus GIBB** – Associate; Division Manager Environmental Division Cape Town
- April 1998 to  
Dec 1999      **GIBB Africa** – Principal Environmental Scientist
- Feb 1997 to  
March 1998      **GIBB Africa** – Environmental Scientist

Key projects include:

**Strategic Advisory Studies**

- Project director as part of the Strategic Advisory Team to the Airports Company South Africa for the proposed Midfield Development at OR Tambo International Airport
- Project director as part of the Strategic Environmental Technical Support Team to the Gauteng Provincial Government for the R20 million Gautrain Project. Technical support will be provided during the construction and operational phases of this flagship transport service

**Strategic Environmental Assessments**

- Project director for the Strategic Environmental Assessment (SEA) and Integrated Waste Management Plan for the Greater Port Harcourt, Nigeria



- Project director for the George Municipality Strategic Environmental Assessment (SEA) for 1 068 km<sup>2</sup> municipal area in support of the Spatial Development Framework and seven Strategic Development Plans
- Project director for the Strategic Environmental Assessment (SEA) of the one million ha Heritage Park. This ecologically sensitive, socio-economically complex Park will encompass Pilansberg and Madikwe Nature Reserve and cross the border between South Africa and Botswana
- Project director for the Strategic Environmental Assessment (SEA) of the Vaalkop Dam Provincial Nature Reserve. This proposed nature reserve will encompass the Vaalkop Dam and surrounding area and link up with the Pilansberg Nature Reserve
- Project director for the Strategic Environmental Assessment (SEA) for the Magaliesberg and Mulderdrift Regions for Eskom. The SEA considers the environmental attributes of the study area and suggests an environmental planning framework specific to the needs of Eskom Distribution

**Environmental Studies (including Land-Use and Sensitivity Analyses)**

- Project director for the environmental scans for the Baralink Commuter Rail Corridor in the City of Johannesburg Metropolitan Municipality. The environmental scan involved the identification of environmentally sensitive areas in close proximity to the proposed Rail Corridor and the suggestion of recommendations for the preliminary design stage of the project
- Project director for the environmental scans for the PWV 10 (Metro Boulevard) in the City of Johannesburg Metropolitan Municipality. Sensitive environmental features were identified spatially and these areas were incorporated into the preliminary design of the road
- Project manager for the environmental study to investigate the proposed irrigation schemes within Olifants/Doring River catchment. The Western Cape Olifants/Doring River Irrigation Study (WODRIS) is a comprehensive study for the Provincial Administration of the Western Cape (PAWC) and is in line with government objectives of integrated river basin management and human settlement
- Project manager for the biophysical assessment of the Spier Development. A development planning process was initiated with the two local authorities, the Stellenbosch Municipality and the Winelands District Council. The proposed development consists of building, recreational and agricultural development types. ARCUS GIBB was appointed to undertake a biophysical assessment and land-use planning exercise as part of the scoping study for the Master Vision of the Spier Development
- Project manager for the environmental sensitivity analysis for Elandsjagt Farm, at the western end of the Du Toit's Kloof valley. ARCUS GIBB was appointed by Intersite Property Management Services to undertake an opportunities and constraints study in order to determine the viability of developing the site for commercial purposes
- Project manager for the environmental sensitivity analysis for proposed development at Grotto Bay on the West Coast. ARCUS GIBB was appointed to compile an environmental sensitivity analysis report to guide the planning process for development. This analysis involved the assessment of the baseline biophysical conditions of the site, the identification of the main environmental issues that could affect the proposed development of the study site and recommendations for mitigation measures

- Project scientist for the Swartklip Environmental Study. A division of DENEL (Pty) Ltd, Swartklip Products, plan to redevelop portions of their 540 ha site near Khayelitsha in Cape Town. Arcus GIBB undertook an environmental analysis of the site to determine which parcels of land were suitable for development purposes

**Environmental Impact Assessments (EIA)**

- Project director for the Basic Assessment processes for the Basic Assessment processes for nine proposed Co-generation Power Plants for the Promethium-Exxaro Joint Venture. This project includes nine cogeneration power plants, to be installed at mines and industrial facilities across South Africa, for the generation of electricity from waste gas. The projects will enable the project initiator to earn Carbon Credits through the Clean Development Mechanism in terms of the Kyoto Protocol under the United Nations Framework Convention on Climate Change.
- Project director for the Environmental Impact Assessment for the proposed Mulilo Coal Fired Power Station and associated infrastructure as well as associated power lines and substations in the Musina area of the Limpopo Province
- Project director for the EIA and EMP for the proposed Transmission Lines (Bantamsklip – Kappa 765 kV and Bantamsklip – Bacchus, Bacchus - Kappa and Bacchus – Muldersvlei 400 kV) for a conventional nuclear power station and associated infrastructure at the Bantamsklip site in the Western Cape (Nuclear 1). The project proponent is the Transmission Division of Eskom Holdings Limited. The EIA includes the screening and selection of suitable corridors, as well as a scoping process and detailed environmental impact assessment. The project includes detailed specialist studies, including social, economic, visual and biophysical, EIA process, public consultation and legal
- Project reviewer (internal) for the EIA and EMP for the proposed upgrade to the Sani Pass, Kwa-Zulu Natal. The project proponent is the Department of Transport. The EIA includes a scoping process and detailed environmental impact assessment, including specialist studies
- Project director and lead reviewer for the Strategic Process Review of the EIA to be undertaken for the Medupi Integration Project in the Limpopo Province including transmission lines and substations for Savannah Environmental
- Project director for the EIA and EMP for the construction of two runways (comprising a new re-aligned runway and second parallel runway) and the Basic Assessment for the upgrade of the access roads at the Cape Town International Airport, for the Airports Company of South Africa (ACSA)
- Project director for the George Western Bypass Road EIA for a 13 km bypass road linking the Outeniqua Pass to the National Road near the George Airport. The proposed road passes through a sensitive socio-economic area comprising 40 small rural properties. Provincial Government of Western Cape
- Project director for the EIA and EMP for the proposed construction, operation and decommissioning of the Pebble Bed Modular Reactor and associated infrastructure in the Western Cape. The project proponent is the Generation Division of Eskom Holdings Limited. The EIA includes a detailed environmental impact assessment. The project includes detailed specialist studies, including social and biophysical, EIA process, public consultation, legal and nuclear technology studies

- Project manager for the EIA and EMP for the proposed construction, operation and decommissioning of a conventional nuclear power station and associated infrastructure in the Western Cape (Nuclear 1). The project proponent is the Generation Division of Eskom Holdings Limited. The EIA includes the screening and selection of a suitable site for the nuclear plant, as well as a scoping process and detailed environmental impact assessment. The project includes 20 detailed specialist studies, including social and biophysical, EIA process, public consultation, legal and nuclear technology studies
- Project director for the EIA and EMP for the proposed expansion of the Morupule Power Station, Botswana. The EIA includes a detailed environmental impact assessment. The project includes detailed specialist studies, including social, air quality, noise impact studies and public consultation
- Project director for the Environmental Impact Assessment for the route determination of the proposed Metro Boulevard, Gauteng Province
- Project director for the Environmental Impact Assessment for the proposed N1/20 Metro Boulevard Interchange, Gauteng Province
- Project director for the Environmental Impact Assessment for the Westgate – Tarlton – Kromdraai 132 kV Sub-Transmission line and associated infrastructure, Gauteng Province
- Project director for the Basic Assessment for the proposed Watershed – Mmabatho 88kV Power line. North West Province
- Project director for the EIA and Public Consultation Process for the 260 km 765 kV transmission powerline between Hydra to Perseus substations (Northern Cape and Free State), the 13 km 765 kV transmission power line between Beta and Perseus substations and associated infrastructure. This study involved a detailed impact assessment with extensive public consultation and specialist investigations
- Project director for the EIA for the proposed reclamation and treatment of Gaborone (Botswana) wastewater for potable use. This study involved a number of specialist studies and extensive public consultation
- Team leader for the EIA, Public Consultation Process, EMP, Water Use Licensing Applications, General Authorisation for Water Use and the Department of Mineral and Energy Affairs Applications for the R10 billion Eskom Braamhoek Pumped Storage Scheme in the Drakensberg. The proposed scheme comprises two reservoirs, interconnected by enclosed tunnel systems, with pump turbine units with a potential generation capacity of approximately 1 333 MW
- Project director for the EIA and Public Consultation Process for the City of Johannesburg's flagship Strategic Public Transport Network R250 million project which aims to provide public transport priority measures for 300 km of road network in Johannesburg
- Project director for the EIA and Public Consultation Process for the upgrade to Staatsartillery Road in Pretoria West
- Project director for various residential housing development EIAs in the Tshwane Metropolitan Municipality and Ekurhuleni Metropolitan Municipality
- Project director for the EIA, EMP and Public Consultation Process for the proposed Selebi – Pikwe Water Master Plan, Botswana. The aim of this infrastructure development is to be able to meet the water needs of the rapidly expanding town of Selebi Pikwe

- Project director for the EIA and Public Consultation Process for the closure of Chlookop Landfill site, Kempton Park
- Project director for the EIA and Public Consultation Process for the proposed generation expansion at Morupule Power Station (currently 118 MW), Botswana. The alternative of increasing power imported under a revised agreement with Eskom was evaluated. A number of specialist studies informed the EIA
- Project manager for the EIA of a proposed upgrade to the Blanco Boulevard, a major arterial road in George. This EIA has involved the evaluation of the archaeological, ecological, socio-economic, traffic, traffic noise, and the town and regional planning impacts of the proposed road link. This project has also entailed a public participation process
- Project manager for the EIA for the proposed Francistown Water Master Plan – Immediate Works, Botswana. The aim of this R250 million water infrastructure development is to be able to meet the development water needs of the rapidly expanding Francistown to year 2021. The project includes an EIA with extensive specialist studies and public participation
- Project manager for the EIA for the new restaurant complex at the Kirstenbosch National Botanical Gardens. The scoping report and EMP formed part of the National Botanical Institute's application for a permit to build within the Cape Peninsula Protected Natural Environment
- Project manager for the environmental studies undertaken at Fisantekraal Industrial Estate, Durbanville. This involved the undertaking of an EIA (including specialist studies) development and implementation of an EMP and rehabilitation specifications, and appointment and management of an Environmental Control Officer
- Project manager on the EIA for the proposed upgrade of the Rooisand Nature Reserve, within the Kogelberg Biosphere, Kleinmond. This project included the facilitation of the public participation process, specialist engineering, hydrogeological, archaeological and botanical studies, the development of an EMP for both the construction and operational phases and input into an opportunities and constraints plan
- Project manager for the environmental services undertaken for Helderberg Reservoirs (8, 5, 3 and 2 MI), Somerset West. This involved the undertaking of an EIA (including public facilitation) development and implementation of an EMP and rehabilitation specifications, and appointment and management of an Environmental Control Officer
- Project Scientist for the EIA of the Waste-tech Vissershok Uitspan hazardous waste disposal site at Vissershok, 24 km north of Cape Town. This project involved the evaluation of the biological, physical, air quality, health, social and economic impacts of the location of two hazardous waste sites at Vissershok. In addition, two extensive public participation processes were undertaken as part of the EIA studies. The EIA studies were undertaken in fulfilment of the Minimum Requirements for Waste Disposal by Landfill published by the Department of Water Affairs and Forestry in 1994
- Project scientist for the EIA of a proposed road link between the Outeniqua Pass the National Road 2 (N2) near George. This project entails a road link to the Outeniqua Pass and N2 that will relieve the increasing traffic pressure on the road network of central George. This EIA has involved the evaluation of the archaeological, agricultural, ecological, socio-economic, traffic, traffic noise, and the town and regional planning impacts of the proposed road link. This project has also entailed a public participation process

- Project Scientist for the EIA of the location of the National Road 2 bypassing Knysna. The Department of Transport required an EIA to assess the impacts of a bypass road on Knysna. A number of alternative routes were investigated during the course of this project. Public participation was required to obtain the views of the I&APs along the proposed route
- Project scientist for the \$2 billion Maputo Iron and Steel EIA. The Industrial Development Corporation of SA (IDC) proposed to construct an iron and steel plant in Maputo, Mozambique, using iron ore stockpiled in Phalaborwa, South Africa. The iron ore (6 million tonnes) would be transported via rail or pipeline from Phalaborwa to Maputo. The iron and steel plant would produce direct reduced iron and steel slab (approximately 3.5 million tonnes). Arcus GIBB undertook the EIA for this project
- Project scientist for the Preliminary EIA of alternative locations (Phalaborwa and Maputo) for an iron and steel plant and routes for a proposed slurry pipeline. An international consortium commissioned a study to investigate the feasibility of an iron ore mill in South Africa. Arcus GIBB was commissioned to investigate the environmental feasibility of this large-scale industrial project

**Environmental Management Plans (EMP)**

- Project director for the compilation of an Environmental Management Plan (EMP) for the construction and operational phases of the Perseus-Gamma, and Hydra-Gamma 765 kV transmission power lines, extension to the Hydra Substation, turn-ins of the Beta-Hydra 765 kV transmission power line to Perseus and upgrading of the Perseus Substation
- Project manager for the Generic Environmental Management Programme for Johannesburg City Parks (JCP). The Generic EMP was developed as a tool for managing the activities of all contractors employed to undertake construction work in the Public Open Spaces within the jurisdiction of the JCP
- Project manager for the Alien Vegetation Management Programme for the implementation of the Working for Water Programme (WWP) for the 300 ha Knysna River catchment. This included the generation of plans from data collected using a helicopter-borne Global Positioning System (GPS) as well as from interested and affected parties, and processed using the Arcinfo/ArcView range of GIS software, provision of recommendations on the time needed to clear the existing infestations and undertake follow-up clearing and setting of measurable goals and indicators against which the success in achieving the objectives of the WWP can be measured
- Project manager for the EMP for the proposed Neptune Interchange Coega Industrial Development Zone (IDZ) in Port Elizabeth. This R1.4 million project will provide the Port Elizabeth area with new industrial opportunities. This project involved the development and implementation of an EMP for the Neptune Interchange contract and Environmental Management Programme (EMPR) for borrow areas for the entire IDZ
- Project manager for the EMP for the proposed construction of Trunk Road 1/1, between George and the Outeniqua Pass. This project involved the upgrading and widening of the 20 km mountain pass, which required environmental input during both the design and construction phases. The appointment included an EMP for the construction phase of the project

- Project manager for the EMP for Thesen Island remediation, Knysna. This R10 million project includes the investigation and remediation of a timber processing plant including creosote and CCA contaminated land. This management involved the development and implementation of an EMP and rehabilitation specifications, and appointment and management of an Environmental Control Officer
- Project scientist for the EMP for Chapman's Peak Drive, Cape Peninsula. The Provincial Administration of the Western Cape commissioned Arcus GIBB to develop an EMP for the rehabilitation of the Chapman's Peak Drive
- Project scientist and rehabilitation specialist for the EMP for the Armaments Testing Facility at Rooiels. Somchem (Pty) Ltd commissioned Arcus GIBB to compile and implement an EMP for decommissioning soil remediation, rehabilitation, revegetation and long term monitoring of 11 ha armaments testing facility in the Kogelberg Biosphere Reserve
- Project scientist for the EMP for the Table Mountain Aerial Cableway upgrade, Cape Town. The National Parks Board commissioned Arcus GIBB to compile an EMP for the construction and operational phase of the R60 million upgrade of the cableway on this internationally renowned landmark. This management plan involved the compilation of environmental specifications to control the activities of the contractor and his staff, thus preventing unnecessary damage to the environment during the construction and operational phase of the project

**Integrated Development Planning (IDP)**

- Project manager for the compilation of an Integrated Development Plan (IDP) for the Buffalo City Municipality, Eastern Cape. This R2.5 million involved the formulation of issues, strategies, projects and budgets for the next five years through consultation with stakeholders in six Municipal Directorates

**Botanical Studies/Rehabilitation Programmes****Succulent Karoo Biome:**

- Project manager for the botanical study for the R250 million Industrial Development Corporation Silicon Metal Project. The project comprised specialist botanical input, GIS mapping and development of an EMP for prospecting that was incorporated into the feasibility study for the establishment of a silicon mine and metal smelter and the prospecting permit application for the proposed mine
- Project manager on specialist environmental input for proposed prospecting and mining by Namakwa Diamond Company (NDC). This project included the provision of specialist botanical input into the Environmental Management Programme Report (EMPR) and Environmental Impact Assessment (EIA) for prospecting and mining of a concession area (2 km wide and 30 km long directly adjacent to the Admiralty Strip) between the Olifants River Mouth and the Namaqua Sands Mine on the West Coast near Lutzville
- Project manager for the specialist environmental input for proposed prospecting and mining Trans Hex. This project included a botanical specialist and rehabilitation study of their surf-zone and Admiralty Strip mining concessions, located between Jakkalshok and Dorningbaai along the Cape West Coast. Phase 1 of the study will comprise a broad vegetation assessment and mapping of the concession area and development of a rehabilitation programme, while Phase 2 will comprise area specific vegetation surveys of the proposed areas to be mined

**Fynbos Biome:**

- Project manager for the specialist botanical study for the proposed development of a regional landfill facility on the Karweyderskraal site, near Hermanus. The proposed site is approximately 100 ha in size. The aim of this specialist study was to survey the site and assess the potential effects of the proposed landfill would have on the flora present on site
- Project manager for the specialist botanical study for the proposed development of social housing at Meerlust Bosbou. The Winelands District Council initiated this development in order to provide social housing for 422 families
- Project manager for the specialist botanical study of the Cape International Airport (CIA) site for the Airports Company of South Africa. This project involves the extension of the existing CIA northwards to cover the entire 350 ha site within the next 35 to 50 years. The environmental input will be incorporated into the planning phase of the proposed developments at CIA and as baseline information for the environmental management system for CIA
- Project manager for the specialist botanical study for the proposed extension of the Zandvliet or Macassar Wastewater Treatment Works and associated infrastructure. The proposed extensions are required to meet the present and future wastewater capacity problems experienced in the Cape Metropolitan Area. Potential impacts of development and recommendations for their mitigation were made
- Project manager for the specialist botanical study for Phases 1 - 3 of the proposed Blaauwberg City development, potential of development and recommendations for their mitigation were made. A Global Positioning System (GPS) was used to map remnant vegetation
- Project manager for the specialist botanical study for phase 7 of the existing Sunset Beach residential development. This project involves the extension of Sunset Beach northwards and comprises the final phase of the Milnerton Estate's developments, potential environmental impacts of development and recommendations for their mitigation were made

**Environmental Audits**

- Project director and lead auditor for compliance audits of Eskom's Gourikwa and Atlantis Gas Turbine Power Stations
- Project director for a due-diligence audits of a number of bottling facilities for an international client
- Project director for waste management audits of the Linbro and Marie-Louise waste sites, Johannesburg
- Project manager for the environmental audit for the operation of the Table Mountain Cableway (TMC). The Table Mountain Aerial Cableway Company (TMACC) developed an environmental management system (EMS) for the operation of TMC in accordance with the requirements of ISO 140001. Arcus GIBB were appointed to undertake an external audit. The audit aimed to assess the current status of the EMS for the operation of the TMC and recommend improvement opportunities based on TMACC's EMS

**Other Studies**

- Project director for the Application for Mining Permits for borrow pits required for the Medupi Coal Fired Power Station, Limpopo Province

## JM BALL C V SHEET 11

## Environmental

- Project director for the Water Use Authorisation process for identified Water Uses at the Portland Cement Company's Jupiter Cement Plant in terms of the National Water Act
- Project director and manager for the 5-year Strategic Plan for the Department of Water Affairs and Forestry Chief Directorate: Water Resources and Information Management
- Head of Arcus GIBB's corporate strategy implementation team which is responsible for the overall implementation of Arcus GIBB's 5-year Corporate Strategy both at Company and business unit level
- Project manager for the corporatisation of the National SMME Fishing Forum. The National SMME Fishing Forum was established in 1999 to represent small, medium and micro entities, defend their interests and rights, as well as promote their development and participation within the industry. Arcus GIBB were appointed by the Forum to assist with the corporatisation of the organisation in order to maximise on investment and development opportunities that are currently available
- Project manager and institutional advisor on the identification of three candidate sites within each of the 20 identified 'search centres' in or around the Cape Metropolitan Area and the environmental audits preparation of 'site acquisition reports' for Ericsson

Oct 1995 to  
Feb 1997

### **University of Cape Town** (Institute for Plant Conservation) - Consultant

Responsible for the planning and execution of specialist vegetation studies in ecologically sensitive areas. Key projects include:

- Developing guidelines for sustainable harvesting of thatching reed
- Environmental assessment of a ecologically rich site on the Southern Cape Coast due to be rezoned and subdivided
- Specialist input relating to the impacts on vegetation within the sites affected by:
  - The upgrades to the Table Mountain aerial cableway system
  - A large entertainment complex on the Cape Peninsula
  - A residential development along the sensitive Cape Peninsula coastline
  - A housing development in the Tygerberg area
  - Three proposed Olympic competition venues in the Cape Peninsula
  - A large multi-purpose community facility in the Cape Peninsula
  - A road upgrade in the Cape Peninsula, and
  - A development corridor in the Cape Peninsula
- Specialist input relating to the management of vegetation within:
  - A sensitive wetland area surrounded by a large entertainment/office park
  - Private nature reserves and
  - A natural area managed for provision of water resources
- Botanical surveys of:
  - A large river catchment area in the Western Cape and
  - A community parkland in the Cape Peninsula



**JM BALL C V SHEET 12****Environmental**

Jan 1992 to  
Sept 1995

**University of Cape Town** (Department of Botany) - Post-Graduate Student

Completed Masters degree in Botany (Ecology), and was involved in practical classes for undergraduate students and supervision of project assistants

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**Professional and other Affiliations**

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Committee member (1997 to 2003) and member (2003 to present), International Association for Impact Assessment

Member, Environment Sub-Committee, Cape Peninsula Protected Natural Environment Sub-committee and General Committee (Portfolio – Environment), Mountain Club of South Africa, 1997 - 2003

Member, Botanical Society of South Africa, 1996 to present

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**Language capability**

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	<b>Speaking</b>	<b>Reading</b>	<b>Writing</b>
English	Excellent	Excellent	Excellent
Afrikaans	Fair	Fair	Fair
Spanish	Basic	Basic	Basic

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**Signature**

**Date**

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## PROPOSED POSITION: Expert Adviser

<b>Company:</b>	<b>UMVOTO Colenco [Switzerland]</b>
<b>Name:</b>	<b>Jean –Marc Lavanchy Teuckens</b>
<b>Nationality:</b>	Swiss
<b>Profession</b>	Geologist
<b>Position</b>	Head Groundwater Protection & Waste Disposal
<b>Date of Birth</b>	1957
<b>Specialisation</b>	Groundwater Protection & Waste Disposal
<b>Experience:</b>	21 years

### Qualifications:

- MSc Geology University of Lausanne, Switzerland 1983
- MSc Hydrogeology University of Neuchâtel, Switzerland 1985
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### Membership of Professional Institutions:

### Relevant Experience

Mr. Lavanchy graduated in geology after successful studies in earth science, geophysics and hydrogeology at the University of Lausanne. He then specialized in hydrogeology at the Center for Hydrogeology at the University of Neuchâtel, where he also worked for several assessment studies related to spring and groundwater protection.

After his extensive studies, Mr. Lavanchy returned to Lausanne where he was engaged as principal investigator for hydrogeological investigations by a firm dealing with geotechnical, geophysical and hydrogeological applications. He conducted numerous field investigations for groundwater protection studies, and prepared and supervised the execution of well and exploration drillings.

In 1987, Mr. Lavanchy joined the waste disposal department of Colenco. His responsibilities have been, on the one hand, the planning, the supervision and the quality control of complex hydrogeologic field campaigns (well testing and fluid logging), as well as the management support to the client. On the other hand, Mr. Lavanchy has been in charge of specialized reanalyses (complex flow models, dual phase environment), interpretations and global hydrogeological syntheses for nuclear, geotechnical and environmental projects. In addition to his participation in national projects in CH, D, F, B and J, he has taken part in field investigations in international projects related to waste disposal such as at the Bure, Grimsel, Mt. Terri and Äspö rock laboratories.

In 1993, Mr. Lavanchy was promoted to Coordinator of the Group Field Investigations. In that position, Mr. Lavanchy contributed to complex hydrogeological studies for critical aspects of deep tunnelling projects. As an expert in the task force set up by the Swiss Federal Railways (SBB) he was in charge of conceptualising and designing an extensive borehole investigation program from the Piora underground rock laboratory for the Gotthard base tunnel project.

His jobs within the task force included project management activities such as co-ordinating field investigations, preparing bidding documents, reviewing proposals, negotiating with candidates and selecting contractors. Thereafter, Mr. Lavanchy was involved in another hydrogeological study related to the Gotthard base tunnel in the Sedrun zone. Since about 2000, Mr. Lavanchy is strongly involved in hydrogeological investigations and syntheses for the evaluation of sites for the disposal of radioactive wastes in Germany and in France.

In the framework of multi-disciplinary projects as well as through continuing education, Mr. Lavanchy has steadily fostered his leadership and project management skills in the course of carrying responsibility for large and complex geoscientific projects covering the areas of site investigation, hydrogeological conceptualization and modelling, and safety assessment issues.

In 1999, Mr. Lavanchy was appointed Manager of the Groundwater and Waste Disposal Department, a financially independent profit center within Colenco Power Engineering. Two years later he engaged in a six month executive training at the IfB-Institute of Management at the University of St. Gallen. Although the better part of Mr. Lavanchy's time is taken up by management tasks, he contributes substantially to synthesis reports and to the conceptualisation and execution of in-situ test campaigns.

### Recent Experience:

#### 2004 – 2006 Switzerland

Project Manager Spatial Information System of the Grimsel Test Site. Development of a virtual 3D model of the GTS with an interactive navigation system and integrated spreadsheet display of experimental and gallery information; animation of the 3D model and its components

#### 2004– 2006 France

Project Manager/ Hydrogeologist; Hydraulic site investigation from boreholes in the rock laboratory; Planning, supervision, interpretation and synthesis of hydraulic borehole tests conducted in the argillites at Bure

#### 2004 – 2005 France

Project Manager/ Hydrogeologist; Hydraulic site investigation from surface boreholes; Hydrogeological studies including support in the planning of the hydraulic borehole testing program, data analysis, synthesis of the results and presentation to the authorities; on-site supervision of instrumentation installations on behalf of ANDRA

#### 2004 – 2005 France

Project Manager, Data transfer and visualisation website for rock laboratory Bure; Installation of an automated data acquisition system based on a database principle; implementation of the website for the visualisation of recorded borehole data.

**PROPOSED POSITION : VISUAL IMPACT ASSESSMENT SPECIALIST**

<b>Company:</b>	BAPELA CAVE KLAPWIJK	<p><b>Qualifications:</b></p> <ul style="list-style-type: none"> <li>• Bachelor of Science in Landscape Architecture: Texas A&amp;M University, USA, 1983</li> <li>• Environmental Impact Assessment, Graduate School of Business, University of Cape Town, 1986</li> </ul> <p><b>Membership of Professional Institutions:</b></p> <ul style="list-style-type: none"> <li>• Registered: South African Council for Landscape Architecture (SACLAP)</li> <li>• Member: Institute of Landscape Architects of South Africa (ILASA)</li> <li>• Member: American Society of Landscape Architects (ASLA)</li> <li>• Member: International Association of Impact Assessors (SA)</li> <li>• Associate: Institute of Waste Management</li> </ul> <p><b>Advisory Positions;</b></p> <ul style="list-style-type: none"> <li>• Executive Central Council Member (Institute of Landscape Architects of South Africa) (1986-1991)</li> <li>• Elected member of the Board of Control for Landscape Architects of South Africa (1995-2001)</li> <li>• City Council of Pretoria, ILASA representative on Town Planning and Aesthetics Committee (1987-2001)</li> <li>• External Examiner, Department of Landscape Architecture, University of Pretoria (1985-present)</li> </ul>
<b>Name:</b>	MENNO KLAPWIJK	
<b>Nationality:</b>	South African	
<b>Profession</b>	Landscape Architect	
<b>Position</b>	Member of CC	
<b>Date of Birth</b>	09.06.1954	
<b>Specialisation</b>	<ul style="list-style-type: none"> <li>• Integrated environmental assessment and planning for existing and future land uses</li> <li>• Visual impact assessment</li> <li>• Mining and quarry reclamation and development planning and design</li> <li>• Site / master planning and development</li> <li>• Landscape design for corporate headquarters, office and industrial parks, housing developments, hotels, plazas and pedestrian malls</li> <li>• Recreation planning</li> <li>• Planning and design for conservation areas, natural resource areas, nature reserves and game farms</li> </ul>	
<b>Start date with Bapela Cave Klapwijk</b>	1989 – Founding Member	
<b>Experience:</b>	23 years	

**Menno Klapwijk** holds a B. Sc degree in landscape Architecture, a diploma in environmental impact assessment and has 23 years experience in visual impact assessment. He and Alan Cave established the firm Cave Klapwijk and Associates in 1989 and since then Menno Klapwijk has been involved as a leader and as a specialist consultant on a number of large EIA studies specifically in the field of visual impact assessment. He has specialised in environmental planning, construction rehabilitation and control, visual impact assessment, and landscape site design. Significant visual impact projects completed or presently being undertaken include: Saldanha Steel, Mozal (Alusaf - Mozambique), Letsibogo Dam (Botswana), Blue Circle cement factory (East London), Phlogopite factory (Phalaborwa), Iscor Heavy Minerals Smelter (Empangeni) as well as several 400 kV and 765 kV transmission lines. He graduated from the Texas A & M University, College Station, Texas , USA in 1983 and has more than 75 publications and reports dealing mostly with environmental planning, environmental rehabilitations and control specification, environmental impact assessment and visual impact assessment. He has been a peer reviewer on several VIAs as well as having prepared the generic VIA terms of reference for Eskom and assisting in developing the VIA guidelines for Western Cape Department of EnvironmentCommittee.

**Relevant Project Experience:**

<b>Completion Date</b>	<b>Project description</b>	<b>Role</b>	<b>Client</b>
2005	VIA for the West Coast Combined Cycle Gas Turbine Power Plant (CGCT) Review Eskom Duvha - Leseding 400 kVA Eskom Majuba-Umfolozu 400kV VIA Herons Bank Golf Course Community Development Sasolberg	Author Author Author Author	EON Solutions Africa for Eskom Resources Eskom Transmission BKS for Eskom Transmission Doug Jeffrey Environmental Consultants

**PROPOSED POSITION : VISUAL IMPACT ASSESSMENT SPECIALIST**

<b>Completion Date</b>	<b>Project description</b>	<b>Role</b>	<b>Client</b>
2004	VIA for De Hoop Dam and Pipeline in Sekukuneland	Author	CSIR/ACER Africa for Dept of Water Affairs
2004	VIA for 400 kV Eros-Neptune Grassridge from Harding to Port Elizabeth	Author	Eyethu Engineers for Eskom Transmission
2005	Ermelo – Majuba railway line. Environmental Management Plan	Co-author	Eskom -Generation
2005 on going	Eskom Zeus Perseus new 765 kV Powerline Standerton to Dealesville Visual Impact Assessment	Author	PBAI for Eskom Transmission
1992 1996	Visual Impact Assessment Alusaf Hillside Smelter and Mozal Aluminium Smelter	Co-author	CSIR for Alusaf CSIR for Mozal
2000	Visual Impact Assessment 400 kV Powerline from Dealsville to Queenstown	Author	CSIR for Eskom
2001	Visual Impact Assessment of 765 kV Gamma – Omega Powerline from Victoria West to Koeberg	Author	PDNA for Eskom Transmission
2001	VIA for the N3 Toll Road Heidelberg to Cedara	Author	N3 Toll Concession (Pty) Ltd.
1997	Letsibogo Dam Botswana Environmental Impact Assessment Report, and EMP	Co-author Reviewer of environmental controls	Dept of Water Affairs Botswana

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

## PROPOSED POSITION: Air Quality, Meteorology and Radiological Health Risk Assessment

<b>Company:</b>	Airshed Planning Professio	<b>Qualifications:</b> <ul style="list-style-type: none"><li>• Bachelor of Science in Engineering, Chemical Engineering: University of Natal, 1982</li><li>• Master of Science in Engineering, Chemical Engineering: University of Natal, 1984</li><li>• Philosophiae Doctor in Engineering, Chemical Engineering: University of Natal, 1984</li><li>• Accredited Inspectorate Authority (AIA) for completion of risk assessments as partial fulfilment of Major Hazard Installation Regulations (Reference MHI013)</li></ul> <b>Memberships:</b> <ul style="list-style-type: none"><li>• South African Institute of Chemical Engineers (Fellow: No. 4533)</li><li>• American Institute of Chemical Engineers (Senior Member: No. 0090107071)</li><li>• National Association of Clean Air</li></ul> <b>Committees:</b> <ul style="list-style-type: none"><li>• SANAS Risk Assessment Specialist Technical Committee</li><li>• Technical Committee on Air Quality Standards Setting</li><li>• SANS Air Quality Standards Specialist Technical Committee (Chairman of Working Group 1)</li></ul>
<b>Name:</b>	LUCIAN BURGER	
<b>Nationality:</b>	South African	
<b>Profession</b>	Chemical Engineer	
<b>Position</b>	Managing Director	
<b>Date of Birth</b>	24.05.1960	
<b>Specialisation</b>	Meso and Micro Meteorology Emission Inventories Air Pollution Control Measures Atmospheric Dispersion Acute/Chronic Heath Risk Assessment Process Risk Assessment	
<b>Start date with APP</b>	2003 – Managing Director	
<b>Experience:</b>	20 years	

**Dr Lucian Burger** is currently the Managing Director of Airshed Planning Professionals (Pty) Ltd and serves on the board of directors of Riscom (Pty) Ltd and Environmental Management Services (CC). Airshed Planning Professionals is a technical and scientific consultancy providing scientific, engineering and strategic air pollution impact assessment and management services and policy support to assist clients in addressing a wide variety of air pollution related risks and air quality management challenges. Riscom specialises in quantitative process risk assessments, including hazan, hazop, what-if analyses, detailed risk assessments, Major Hazard Installation and incident investigations, and other risk related studies. Software design and development of air pollution dispersion models, dynamic process outflow and evaporation models, consequence models and database applications are maintained in Environmental Management Services. He completed his bachelor's degree (cum laude) in chemical engineering at the University of Natal in 1982. His postgraduate studies (MSc Eng and PhD) were specifically focussed on the development of dispersion modelling theory and related software applications. These degrees were completed in 1984 and 1986, respectively. Air pollution consultation consulting services started in 1990 with an international contract on the evaluation and validation of transport models as applied to the Chernobyl accident of April 1986 (International Atomic Energy Agency). Since then, numerous atmospheric dispersion studies have been completed locally and internationally, ranging from environmental impact assessments, risk and hazard assessments, meteorological studies, process designs, to the development of toxic gas evacuation response systems, and other related software. Memberships include the South African Institute of Chemical Engineers (Fellow: No. 4533), the American Institute of Chemical Engineers (Senior Member: No. 0090107071), Accredited Inspectorate Authority (AIA) for completion of quantitative risk assessments (MHI 013).

### Relevant Project Experience:

- Development and maintenance of the HAWK Real-Time Dispersion Model, which forms part of the NECSA Emergency Planning System. This model was specifically modified to include all forms of radioactive exposures, including external and internal.
- Team member and South African representative to the Atmospheric Transport Model Evaluation Study (ATMES Project). This was an international evaluation and validation of transport models as applied to the Chernobyl accident in April 1986. The study was initiated by the International Atomic Energy Agency (IAEA), jointly with the World Meteorological Organization (WMO) and the Commission of the European Communities (CEC). The WIZARD V1.0 (developed during L Burger's PhD) was also evaluated for its applicability and performance as applied to long-range dispersion.
- The development of Real-Time Dispersion Model for Koeberg Power station. The original intention was to use the model in a similar fashion as at the NECSA premises.
- Derivation Of Koeberg-Specific Dispersion Coefficients For Use In Gaussian Dispersion Models. A computerised methodology was developed to estimate the horizontal and vertical dispersion parameters in the format required by the COSYMA model.
- Proposed Corridor Sands Heavy Minerals Mine and Processing facility (Mozambique): Scope included emission inventory of proposed mining activities, meteorological analysis, dispersion simulations and a health impact assessment.
- Proposed Moma Heavy Minerals Mine and Processing facility (Mozambique): Scope included emission inventory of proposed mining activities, meteorological analysis, dispersion simulations and a health impact assessment.
- Detailed air impact assessment of the Namakwa Sand Heavy Minerals Mine for an EIA and the development of an EMPR.

Signature:



Date: 6 July 2006

**PROPOSED POSITION: Air Quality, Meteorology and Radiological Health Risk Assessment**

Signature:

A handwritten signature in black ink, appearing to read "B. G. G." or similar, written in a cursive style.

Date: 6 July 2006

# Liz Day

## CURRICULUM VITAE

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Name	Elizabeth Day (née Reynolds)
Date of birth	3 May 1968
Place of birth	Zimbabwe
Nationality	South African
Position in company	Founding member

### KEY QUALIFICATIONS

- Bachelor of Arts (English), University of Cape Town, 1989
- Bachelor of Science (Zoology (with distinction) and Environmental and Geographical Science); University of Cape Town; 1992
- Bachelor of Science (honours- Zoology, first class); University of Cape Town, 1993
- PhD (Zoology); University of Cape Town, 1998

### KEY WORK EXPERIENCE

1999- present Specialist consultant on freshwater ecosystems; co-founder of the Freshwater Consulting Group  
1997 - 1999 Senior Consultant for Southern Waters Ecological Research and Consulting cc  
1994 - 1996 Scientific Officer on Water Research Commission Project, Freshwater Research Unit, UCT.

### SUMMARY OF RELEVANT EXPERIENCE

Over 12 years' experience in aspects of aquatic ecology, specialising in:

- urban river and wetland management and rehabilitation
- urban stormwater design with respect to freshwater ecosystems
- water quality
- environmental impact assessments; baseline and situation assessments
- SASS5 biomonitoring
- Catchment and River Management Plans
- urban river and wetland mapping and biodiversity planning

Compiled over 200 specialist riverine ecology technical reports, 7 scientific papers (5 in international literature), 20 popular biological articles published in local environmental magazines, scripts for eight environmental documentaries. *Ad hoc* lecturer in freshwater ecology at UCT and PennTech; member of UNESCO urban aquatic habitat working group; co-author on 2 Water Research Commission reports; Steering Committee member of Western Cape Wetlands Forum, lead author on chapter in UNESCO Sustainable Management of Urban Aquatic Ecosystems.

### PROFESSIONAL AFFILIATIONS

- Member of IAIA
- Member of SAIEES
- Registered Professional Natural Scientist by SACNASP (Reg No 400270/08) for fields of Biological Science, Ecological Science and Zoological Science

Age : 51  
Parent Firm : Mark Wood Consultants  
Address : PO Box 41820  
: Craighall 2024  
: Gauteng Province  
: South Africa  
Telephone/Fax : +27(11) 327-1567  
: +27(11) 447-7018  
Email : [markwood@global.co.za](mailto:markwood@global.co.za)  
Registration No : CK 89/23449/23  
Nationality : South African  
Position in Organization : Member



## QUALIFICATIONS

B.Sc (Geog) Witwatersrand 1979  
BA (Psych) Witwatersrand 1983

## EXPERIENCE

1980 – 1985 : Project Scientist, Dames & Moore, South Africa  
1985 – 1986 : Associate, Dames & Moore, South Africa  
1986 – 1987 : Partner, Knight, Dames & Moore  
1987 – present : Member, Mark Wood Consultants

### **Area of Expertise**

Integrated Environmental Management (IEM). Coordination of all aspects of IEM including preliminary (scoping) studies, environmental impact assessments, management plans, monitoring, auditing and review of a diverse range of development projects. Work includes policy and project levels. Specialist expertise in leading environmental teams, public involvement/conflict resolution and aesthetic impact studies. Extensive experience of World Bank and other financier requirements for projects in developing countries. Extensive experience of large project review for Government and public and private organizations.

### **Overall Summary of Experience**

**Mark Wood** has spent most of the past 18 years leading EIAs for major development projects. Of these projects, many have involved installations that are controversial. He has extensive experience of review work. He has, for example, recently led the team that reviewed the Gautrain Variant alignment assessments for the provincial environmental regulator, G-DACE. He was also responsible for reviewing the original EIA for the project, prepared in 2004. He has reviewed the initial phase of the EIA for the Superhighways project between Johannesburg and Pretoria on behalf of Gautrans and PetroSAs proposal to develop gas supply infrastructure in the Western Cape. He is currently a review consultant for Eskom's two proposed coal fired power stations at Kendal and Lethabo and has recently reviewed the Hydra-Perseus 400kV transmission line EIA. He is currently a review consultant for the



Department of Environmental Affairs and Tourism evaluating the merits of appeals against the Gamma –Omega 765kV line.

He has led and continues to lead large EIAs. He is currently the leader of the team responsible for the EIA of offshore seismic work in the highly sensitive marine environment of the Quirimbas National Park in Mozambique. He recently led the team for all of the upstream EIAs (three separate projects) of Sasol's Natural Gas Project (NGP), including exploration, the development of the onshore gas fields and the transport of the gas from Mozambique to South Africa in an 860 km underground pipeline. The total estimated value of the NGP is approximately \$1 billion. He continues to be extensively involved in subsequent work on this project in Mozambique and South Africa.

Mr Wood has been responsible for coordinating an extensive list of other EIAs for hazardous oil and gas pipeline installations, major development and infrastructure projects. He has extensive experience in both urban and rural environmental and social evaluation. He has worked extensively with World Bank, IFC and other European financiers and is familiar with the policy guidelines and requirements of the international finance community.

### **Project Experience**

*Environmental Impact Assessment of Seismic Acquisition for Offshore Oil and Gas Exploration in the Quirimbas Archipelago.* EIA Coordinator. 2006-present. The project includes an assessment of the impact of seismic acquisition on the adjacent Quirimbas National Park, which is a marine and terrestrial park of international importance. Impacts of seismic acquisition are mainly about the acoustic effects of the air gun arrays on marine species and the consequent effects on ecological functioning, artisanal fishing and tourism. (Client: Hydro Energy, Norway).

*Environmental Impact Assessment of a Condensate Pipeline near Bazaruto Archipelago in Inhambane Province, Mozambique.* Project leader. 2005 - present The project involves an assessment of the impact of an overland and undersea pipeline just north of the Bazaruto Marine Reserve. Sasol proposes to transport the condensate stripped from the gas at their Temane Production Facility. This is an alternative to the present method of transport to Maputo by road. The EIA is considering all aspects of impact caused by the pipeline but, in particular, the risks and consequences of a spill, either as a result of loading of condensate, or as a consequence of a shipping accident and a release of bunker oil. The completion of the EIA has been delayed at the request of the client (Client: Sasol Temane Ltd.).

*Environmental Auditing of Sasol Temane Mozambique Project Infrastructure.* Project author. 2005-ongoing. Mr Wood is responsible for the annual independent audit of Sasol's Resettlement Planning and Implementation Programme over the next 5 years. The work involves verification that the intent of the programme, which was to re-establish the livelihoods of the affected people, has met its objectives.(Client: Sasol Gas).

*Annual Integrated Disclosure Report for Sasol Ltd's Natural Gas Project.* Project author. 2004 – ongoing. The report is an annual requirement of the project lenders and involves a comprehensive review of Sasol's compliance with its legal and other obligations in respect of the environment in Mozambique and South Africa. The report is based on a critical evaluation of independent audit reports, prepared during the year, as well as consultants reports and other documentation prepared by Sasol's ESOs and other project personnel. (Client: Sasol Ltd).

*Strategic Environmental and Social Assessment of the Development of the Ibhubezi Gas Fields off the west coast of South Africa.* 2003-2004. Project review consultant. The assessment has involved a critical evaluation of the desirability of various options proposed for the development of the offshore Ibhubezi Gas fields. The most favoured option, proposed by the client, was to supply gas via a high pressure gas pipeline to two anchor industries: Mossgas (an existing gas - to liquid plant on the Southern Cape Coast, soon to exhaust its gas supply from an existing gas fields) and a combined cycle gas fired power station, a location for which is still to be determined. The assessment considered a wide range of strategic issues associated with the development of the gas industry in the Southern Cape, including other options for the supply of natural gas, such as importing Liquefied Natural Gas. The project is ongoing (Client: PetroSA).

*Regional Environmental and Social Assessment of the Sasol Natural Gas Project in Mozambique and South Africa.* 2003. Project leader. The assessment was intended to look beyond the immediate zone of direct social and economic impacts of the project components, to address induced and cumulative impacts in the geographic areas affected by the eight project components. A number of these impacts had already been identified by the independent project-specific Environmental Impact Assessments ("EIAs") but had not been assessed, either cumulatively or in detail. Of particular importance in Mozambique was the potential for increased hardwood exploitation along the access lines created by the pipeline to South Africa and the flow lines linking production wells to the Central Processing Facility. Other important impacts included effects on harvesting of other natural resources, effects of the project on induced settlement and other growth along a strategically important coastline for tourism development, a variety of other socio-economic implications, both positive and negative, and reductions in natural resource consumption and air pollution emissions in South Africa as a result of the use of natural gas to replace coal-based energy. The study was prepared in consultation with the World Bank Mission for the project and in accordance with their requirements (Sasol Ltd.)

*Environmental Impact Assessment of a Proposed Hydrogen Pipeline to Supply Impala Platinum in Springs, Gauteng.* 2002. Project leader. The EIA evaluated a proposal to supply hydrogen to Impala Platinum from the Sasol hydrogen reformers in Sasolburg, via a 110km pipeline, through urban, peri-urban and rural areas to the Impala Platinum Refinery premises in Springs. An alternative process of reforming hydrogen on the Impala site was examined in the study and was rejected in favour of the pipeline. Detailed social and biophysical investigations were undertaken, including an assessment of construction and operational impacts. Key social impacts were related to community risks in the event of an accident as well as the potential for impacts on residential property values. Biophysical impacts were mainly in respect of construction effects through sensitive terrestrial and aquatic habitats. The project was approved by the Environmental Authority (Air Products).

*Environmental Impact Assessment of the Sasol Gas Field Development at Temane and Pande in Mozambique.* 2000-2001. Project leader. The EIA was completed for the three main project elements, namely: (a) Seismic exploration work (b) The development and operation of the gas fields near the coast in Inhambane Province and (c) the development and operation of the main supply pipeline to South Africa. The work was conducted with the assistance of local Mozambique consultants, *Impacto*. A comprehensive range of specialist investigations was prepared with these reports including studies on the impacts on fauna, flora, tourism, nearshore ecosystems, aesthetics, noise, archaeology, agriculture and socio-economics. (Sasol Ltd).

*Environmental Impact Assessment, Environmental Management Plan, Construction and Post-Construction Monitoring of a Natural Gas Pipeline between Temane in Inhambane Province in Mozambique and Secunda in Mpumalanga Province in South Africa.* 1999 - ongoing. Project leader. Separate EIAs were undertaken for the South African and Mozambique sections of the route. Reports were prepared to meet the requirements of the Environmental Authorities of both countries as well as international donor agencies (World Bank, IMF, European Investment Banks). An Initial Appraisal of Corridor Options was prepared in order to limit the number of routes necessary for investigation in the EIA. The Environmental Authorities approved this document prior to the scoping investigation. The scoping report was completed and was submitted to the Environmental Authorities for approval before the start of the specialist investigations. Key construction issues in South Africa included impacts on erosion (RSA escarpment), threatened habitats and threatened species, wetland and river crossings, conservancies/natural heritage sites and irrigation agriculture (particularly in the highly developed Kaap River valley). In Mozambique, key construction issues also included the risks of natural resource plundering caused by the opening of access into previously remote areas and issues related to employment, loss of resources in the construction right of way, malaria and induced migration. Key operational issues involved the hazards associated with of a pipeline failure. In Mozambique, the control of settlement in the pipeline corridor was a major issue.

*Environmental Impact Assessment of a Proposed Base Metal Refinery for Impala Platinum in Springs, Gauteng Province, South Africa.* Project Leader. 2005-2006. The study involved full public participation, scoping, specialist investigation and reporting of Impala Platinum's proposal to double the capacity of their base metal refinery in Springs. Key issues included air quality, water quality, waste management, noise, traffic and explosion hazards. Air quality issues were exacerbated by

existing pollution loads in the atmosphere and caused by surrounding activities. (Client: Impala Platinum).

*Environmental Impact Assessment of the Use of Alternative Fuels in the Holcim Dudfield Cement Kilns.* Project Leader. 2006-ongoing. The project involves the assessment of the burning of wastes in the kilns as a supplement to coal. Key issues include air quality and health effects and, in particular, the potential to generate dioxins and furans in upset or start up conditions. Accumulation of dioxins and furans in the food chain in the surrounding areas is a particular concern.(Client: Holcim South Africa).

*Environmental Scoping Assessment for a Methane-rich Gas Pipeline to supply the Engen refinery in Durban South.* 2000-2001. Project leader. The study area was predominantly in industrial and residential precincts and the investigations concentrated on public risks of the operation of the line and route alternatives to minimize risks. The project was approved and the pipeline built in the year 2000. (Sasol Gas).

*Environmental Impact Assessment of a Proposed Low Income Settlement at Brandvlei near Tarlton, Gauteng.* 1999-2000. Project leader. The proposal included a green fields development of 716 site and service erven intended for rural homeless people from the general area. The EIA process consisted of a full scoping investigation including a public open day. The scoping report determined that the main risks would be in relation to water pollution, depending on the sewage treatment process selected. The area had high farming potential and was dependant on groundwater. Opportunities existed to link the settlement with a farming initiative on adjacent land owned by WGSC and to use the treated liquid sewage effluent to supply this. Other issues concerned air pollution and the social interaction between the new residents and the existing landowners. The EIA phase of the project has still to be completed. (Western Gauteng Services Council).

The Environmental Management Plans for both sections of pipeline included requirements for control of (a) design impact (b) construction impact (c) operational impact (d) monitoring and auditing. Construction is currently underway and is being conducted in accordance with the requirements of the Construction Management Plan. (Sasol Ltd).

*Environmental Review Consultant for South African National Roads Agency projects. Year 2001 ongoing.* The work includes (a) *The Superhighways Project, involving the upgrading and tolling of the N1 to Pretoria and other highway infrastructure around Johannesburg and Pretoria* (b) *The Platinum Toll Highway Project* and (c) *The Transkei Toll Highway Project.* (SA National Roads Agency Limited)

*Environmental Impact Assessment and EMPR of the Alpha Saldanha Cement Plant and Limestone Mine.* 1997-present. Project Leader. The EIA included extensive public participation and 13 specialist studies, including alternatives, flora, fauna, air quality, groundwater and surface water, acoustics, mariculture and nearshore ecosystems, aesthetics, palaeontology, economics, tourism and resort development and town planning and social infrastructure. The findings of the study indicated a significant level of impact, particularly in relation to the mining, which is proposed in an area near the coast with high social, ecological and palaeontological sensitivity. The EMPR is currently being undertaken (Alpha Ltd).

*Environmental Impact Assessment, Comprehensive Mitigation Planning (CMP) and Implementation Monitoring of the Maguga Dam in Swaziland.* 1999-2001. Project Leader for the EIA/CMP. The project involved comprehensive assessment, planning and implementation in both the Reservoir Area, where the dam is under construction, and the Resettlement Area, where some 400 people must be resettled from the dam basin. The CMP involved all of the work necessary to ensure that the reservoir and resettled communities were fairly compensated for the impacts they experience. The study team consists of some 29 professionals in the social and biophysical sciences. Implementation will involve monitoring of all the contract work necessary to re-house affected families, develop agricultural lands, construct infrastructure and all other activities necessary to mitigate the impacts of the reservoir on the affected community. (Komati Basin Water Authority).

*Environmental Impact Assessment of the Proposed Maseru to Maseru 132kV Transmission Line in Lesotho.* 1996-1997. Project Leader. Key issues were social and aesthetic. Visual simulations were compiled to illustrate impacts of the line in the most sensitive mountain passes. Recommendations were made to re-align an existing 33kV line onto a double circuit tower with the new line in order to minimize these impacts. (Lesotho Highlands Development Authority).

*Environmental Impact Assessment of Bulk Infrastructure for Magaliesburg Rural Council Area.* 1998 - 1999. Project coordinator. The study involved site selection and environmental assessment of a sewage treatment works. The Magaliesburg local area is environmentally sensitive, and is one of Gauteng's premier local hospitality and ecotourism destinations. Odour management was a key issue in the study and special measures were recommended to minimize odour risks at nearby tourism venues. The sewage treatment works was built according to the recommended specifications and its operation is monitored in terms of an Environmental Management Plan (Western Gauteng Services Council).

*Environmental Impact Assessment of a Proposal to build a Crude Oil Pipeline between Durban and Vrede in the KwaZulu-Natal and Free State Provinces of South Africa.* 1997 - 1999. Project leader. The EIA included an assessment of corridor alternatives that resulted in the selection of a corridor based on technical and environmental criteria. The regulatory authorities accepted this corridor as the subject of detailed investigation in the EIA. The route was 400kms long and involved approximately 380 landowners and several hundred rural subsistence farmers. (The Crude Oil Pipeline Joint Venture).

*Environmental Impact Assessment, Impact Management and Construction Supervision of a 400 kV line through the Gauteng, Orange Free State and Natal.* (RSA). 1989-1990. Project leader. The EIA recommended realignment of the route around the Memel wetlands. Impact management and construction supervision involved extensive erosion control measures. (Eskom).

*Social and Environmental Planning Study for the Lesotho Highlands Feed Roads and Reservoir Crossing Project. Contract LHDA 78.* 1993 – 1998. Project leader. The study included identification and review of constraints and opportunities affecting the development of the proposals. Work also included environmental and social management of detailed design and construction. (Lesotho Highlands Development Authority).

*Environmental Impact Management Plans for eight major quarries.* 1990-1998. Project leader. The projects variously involved the formulation of Environmental Management Programme Reports (EMPR's), mining development plans, rehabilitation specifications, progressive reclamation proposals and operational impact plans. (Hippo Quarries).

*Environmental Impact Assessment of a Proposed Sewage Treatment Works for Graskop in the Eastern Gauteng.* 1994. Project leader. The study involved modeling of measured and simulated river and sewage effluent flow data at various points downstream where recreational use was occurring. Special standards for phosphorous and nitrogen were recommended for the works. (Hawkins Hawkins & Osborne).

*Environmental Impact Assessment, Management Plan and Special Conditions of Contract for a proposed gas pipeline between Tembisa and Roslyn in Gauteng.* 1994 – 1995. Project leader. The high-pressure gas pipeline was proposed through the urban and peri-urban areas surrounding Pretoria, including two sensitive areas of natural heritage, the Witwatersberg and the Magaliesberg. The EIA involved comprehensive public and authority scoping and included an investigation of alternatives through the Magaliesberg. The project was approved subject to the conditions set out in the EIA, and an Environmental Management Plan and Special Conditions of Contract were prepared for construction of the pipeline. (Client: Sasol Ltd).

*Environmental Impact Assessment of the National Road 3, Harrismith bypass alternatives.* 1993-1994. Project leader. The EIA recommended against the western bypass alternative planned by the Department of Transport since 1985. Major issues were social, including impact on regional development potential, local business in the town, acoustics, pedestrian safety and traffic impact. (Department of Transport).

*Environmental Impact Assessment and Impact Management of a 400kV-transmission line and construction of access roads between Newcastle and Richards Bay. 1991-1992. Project leader. The study included assessment of ecological, aesthetic and social criteria. Extensive negotiations with tribal leaders and councilors in KwaZulu Natal were undertaken. (Eskom).*

*Environmental Impact Assessment, management and construction monitoring of the N17 expressway south of Johannesburg. 1986-1987. Project leader. Investigation spanned seven years and included assessment of a wide range of issues along a 50km stretch of urban and peri-urban roads. Issues included expropriation of property and houses, acoustics, visual impacts, property depreciation, ecological impacts on open space and many others. (Department of Transport).*

### **Other Typical Experience (Project Leader)**

#### **Transportation and corridor studies**

*Environmental Impact Assessment of mass transit options for the Johannesburg Metropolitan Area.*

*Environmental Impact Assessment of transportation planning in the Durban Functional Region.*

*Environmental Impact Assessment, impact management and construction supervision of an 88kV line in peri-urban Johannesburg.*

*Visual Impact Assessment of a 132kV line in the Durban Functional Region.*

*Environmental Impact Assessment of a 132kV power line through Morningside.*

*Environmental Impact Assessment of a 400kV-transmission line route through Magaliesberg and Bophuthatswana.*

*Environmental Impact Assessment, impact management and construction supervision of a railway line near Port Shepstone.*

*A policy study for the inclusion of environmental considerations in Eskom's transmission planning and construction.*

#### **Urban Land-use**

*An open space policy for the Central Witwatersrand Region.*

*Proposals for the control of development of the Parktown Ridge.*

*Environmental Impact Assessment of a township development on the Imbezane Lagoon, Ramsgate, within the 1 000m planning restriction zone.*

*Environmental Impact Assessment of a township development proposal in environmentally sensitive ridges south of Johannesburg.*

*Environmental Impact Assessment for the Ulundi Structure Plan, KwaZulu.*

*Environmental Impact Assessment and site planning of Rand Water Board headquarters in the Klipriviersberg hills.*

*Various environmental studies for town and regional planning hearings and application.*

*Environmental aspects of the Rietfontein masterplan.*

#### **Power Generation**

*Initial Environmental Assessment of the development options for a Liquefied Natural Gas Facility and Combined Cycle Gas Fired Power Station at three coastal locations in South Africa*

*Environmental Impact Assessment of alternatives for the disposal of ash at Matla power station.*

**Mining / Industrial**

*Environmental Impact Assessment (Phase 1 and 2) of a proposed 20 million t/a underground coal mine in Central District, Botswana.*

*Installation of a meteorological station at Shell Pering lead/zinc mine in the NE Cape and reduction and analysis of data.*

*Installation of a meteorological station at a proposed Shell coal mine in Botswana, and reduction and analysis of data.*

*Environmental Impact Assessment of a proposed cement plant near Port Shepstone, Natal.*

**Waste Disposal**

*Preliminary Environmental Assessment of a municipal waste disposal site at Ulundi in KwaZulu.*

*Environmental Impact Assessment and rehabilitation plans for a proposed Johannesburg landfill site.*

*Environmental Impact Assessment of a proposed sewerage works for Umtentweni in Natal.*

*Environmental Impact Assessment of alternative locations for a sanitary landfill at Thulamahashe in Gazankulu.*

**PUBLICATIONS AND REPORTS**

15 papers published and delivered at local conferences  
10 articles published in technical journals

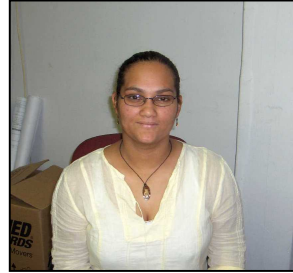
**MEMBERSHIPS**

Member of the International Association of Impact Assessment

**BEE STATUS**

Mark Wood is the sole member of Mark Wood Consultants.

<b>Company:</b>	ARCUS GIBB
<b>Name:</b>	NURAN NORDIEN
<b>Nationality:</b>	South African
<b>Profession</b>	Transportation Engineer
<b>Position</b>	Project Engineer
<b>Date of Birth</b>	24.05.1981
<b>Specialisation</b>	Traffic Engineering, Transportation Planning, Project Management.
<b>Start date with ARCUS GIBB</b>	2003 to present. Permanent full-time staff member
<b>Experience:</b>	4 years



**Qualifications:**

- Bachelor of Science in Civil Engineering : University of Cape Town, 2002
- Graduate Member of the South African Institution of Civil Engineers, 2005
- Registered as a Candidate with the Engineering Council of South Africa
- Candidate Construction Project Manager (SACPCMP)

**Ms. Nuran Nordien** holds a BSc in Civil Engineering and is registered as a Candidate Engineer (ECSA). She is a Transportation Engineer with 4 years experience in the transportation and civil engineering field. She is currently the project engineer with the ARCUS GIBB's Traffic Engineering and Transportation Planning Team in Cape Town.

Nuran specialises in the Transport Impact Assessments (TIA's), and Transport Planning studies. As a specialist Transportation Engineer, Nuran has undertaken several transportation studies around the country, but mostly in the Western Cape Region. She has been involved in the project teams of a number of high profile projects, including the development District Six in Cape Town, the upgrade of the Impala Platinum Mine in Springs, the Gautrain development in Gauteng and the 2010 FIFA World Cup Stadium in Cape Town.

**Relevant Project Experience:**

Project Engineer for:

- 2010 Soccer World Cup Transport Planning: Information gathering, meeting attendance, Report compilation and writing
- District Six Development Framework: Transportation Input, info gathering, meeting attendance, Report compilation and writing
- Working For Tourism: Transportation input into developing and designing Tourism info centres
- Taxi Recapitalisation : Information gathering
- Several Transport Impact Assessments (TIA) and Traffic Impact Statements (TIS) listed below. Responsibilities include: Info gathering, Coordinating traffic count consultant, setting up traffic model, analysis, meeting attendance, final report compilation and writing
  - Conradie Hospital TIA
  - Gautrain Maintenance Yard TIA (Midrand)
  - Meandering Creek TIS (East London)
  - Rouwkoop TIA
  - Cape Quarter Development TIA
  - Silverbird Square Shopping Centre TIA
  - Bayside Shopping Centre TIA
  - Impala Platinum TIA (Gauteng)
  - Del La Ray TIA
  - Brackenfell TIS
  - MJC TIA
  - Vanguard Slip Lane Motivation
  - Berg River TIS
  - Brooklyn TIS

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

## PROPOSED POSITION: LEAD ENVIRONMENTAL LEGAL SPECIALIST

<b>Company:</b>	Nicholas Smith & Assoc
<b>Name:</b>	<b>Nicholas Smith</b>
<b>Nationality:</b>	South African
<b>Profession</b>	Attorney
<b>Position</b>	Director
<b>Date of Birth</b>	07.08.1967
<b>Specialisation</b>	Environmental and administrative law
<b>Start date with NS &amp; A</b>	1 March 2005 (date of establishment of the firm)
<b>Experience:</b>	12 years

### Qualifications:

- Bachelor of Arts: University of Cape Town, 1990
- Bachelor of Arts (Hons): University of Natal, 1991
- Bachelor of Laws: University of Cape Town, 1993
- Advanced Diploma in labour law: RAU, 1996
- Master of laws: University of Cape Town, 2001
- Admitted attorney of the High Court of South Africa (1996)

### Membership of Professional Institutions:

- Member of the Law Society of the Cape of Good Hope

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**Mr Nicholas Smith** holds a Masters degree in environmental law. Nicholas also holds the BA (University of Cape Town or UCT), BA (Hons) (University of Natal) and LLB (UCT) degrees, as well as an Advanced Diploma in labour law (from the Rand Afrikaans University). He also completed in 2001, a two-year (part-time) Master of Laws in environmental law and policy at the University of Cape Town. The *capita selecta* that he completed are in marine resources law, coastal zone law, South African environmental law, and international environmental law. His dissertation considered and analysed critically, the regulation of estuarine ecosystems in South African law.

Nicholas was admitted as an attorney in the Transvaal Provincial Division in February 1996 and in the Cape of Good Hope Provincial Division in March 1996.

Nicholas is an experienced environmental lawyer who has been practising exclusively in this field for the past nine years. He co-founded Winstanley and Smith Attorneys in 1998 and thereafter, Winstanley Smith and Cullinan Inc (in 2001) and assisted in establishing *EnAct* International's Cape Town office, in 1998. He is the principal and founder of Nicholas Smith and Associates, which commenced business on 1 March 2005. His associates in the firm are Sibonelo Ndlovu and Richard Summers. They are assisted by Janse Rabie. All four lawyers in the firm are the holders of Masters degrees in environmental law.

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### Relevant project experience:

A sample of work experience (with the emphasis on the larger projects undertaken) during the last decade includes:

- Assisting with the preparation of a baseline review of all existing national legislation governing pollution control and waste management in Namibia. The baseline review was prepared with the aim of drafting new integrated legislation to regulate pollution control and waste management in Namibia. This project was undertaken in conjunction with staff from the London office of *EnAct* International Limited ("*EnAct*").
- Undertaking an environmental due diligence for a major parastatal in the energy provision business in South Africa, with discrete facilities in the Western Cape and Mpumalanga provinces, focusing on discrete aspects and impacts of those operations. The due diligence involved *in loco* inspections at four sites, extensive interviews with personnel at those sites, and the drafting and settling of a comprehensive review of all existing South African environmental law pertinent to those operations and in particular, their regulation of the aspects and impacts there.
- Undertaking a substantive due diligence and co-authoring detailed reports regarding the proposed disposal of state-owned assets used for energy generation in the Islamic Republic of Mauritania (a World Bank-funded project undertaken with CSIR as lead consultant).
- Assisting a variety of corporate clients in Southern Africa with ISO 14 001 certification. Legal registers have been prepared for clients in South Africa, Swaziland and Namibia, and we have undertaken work foundational to the preparation of an environmental management system, for a corporate client in Zambia.
- Preparing an environmental legal review of applicable natural resource management and forestry legislation for a major forestry company and pulp producer in Bhunya, Swaziland. One element of the review exercise was an analysis of a range of new environmental legislation which has been prepared for Swaziland, by *EnAct*, and on contract with the British Department for Foreign Development. One of these laws (the waste regulations) has already been gazetted and there are a number of others that will have profound implications for industry in Swaziland if published in their present form.
- Assisting in an environmental due diligence on the operations of a division of a major South African synthetic fuel producer. Our firm was approached by the lead due diligence team (Arthur Andersen) to conduct this portion of the due diligence (as well as the occupational health and safety component).

Signature: \_\_\_\_\_

Date: \_\_\_\_\_



## PROPOSED POSITION: LEAD ENVIRONMENTAL LEGAL SPECIALIST

- Undertaking various large-scale due diligence exercises for a variety of corporate clients, including a number of South Africa's leading commercial law firms which instructed us to undertake all of the environmental aspects of the due diligence. Ordinarily, the exercise would include land-use and planning issues, emissions to different media and the legal regulation of those emissions, an analysis of all contractual arrangements of the company under review to assess its likely environmental risk and the potential for liability, rights to use natural resources during the industrial process, and issues of public liability. The companies that we have analysed include synthetic fuel producers, chemical companies, forestry companies, paper producers, producers of seed, and producers of a variety of industrial and domestic products.
- Involved in assisting a major local fishing company to understand and implement an environmental management system to ISO 14000 specifications. I have undertaken the legal component of a number of environmental reviews that have as their aim the production and adoption of an environmental management system. In some cases we have produced an electronic version of our report and/or the database (most notably for a marine diamond mining company) in order for it to be capable of easy updating. In the case of the Namco database we entered into a joint venture with Jutastat, the electronic publishing company and produced the database on CD-Rom;
- Working on a six month multi-disciplinary project in the Maloti-Drakensberg mountains which related to the most appropriate manner in which to preserve the high altitude biodiversity found in that area. This project was funded by the World Bank and administered by the Global Environment Facility.
- Preparing a review of existing and future laws and policies at national, provincial and local authority level for a trust that is undertaking the provision of water supplies and sanitation services to disadvantaged rural communities in five different provinces;
- Briefed by the CSIR to prepare a review of relevant Zambian environmental legislation to assist a client with its plans for a major investment in that country;
- Instructed by the Robben Island Museum to conduct a legal and administrative review of existing controls that govern activities with environmental implications on the island. This project contained specific components related to the marine environment;
- Drafting a legal review for Marine and Coastal Management (in the national Department of Environmental Affairs and Tourism) on the domestic legal regime regulating estuaries. I presented my paper at a national workshop on estuarine management held in Port Elizabeth in May 2000.
- Assisting *EnAct* with the preparation for enactment into law of the principles contained in the *White Paper on Sustainable Coastal Development in South Africa* (as a national statute, the (draft) National Coastal Management Bill).
- Drafting the legal component for the nomination for World Heritage Site status, of the Cape Floral Kingdom.
- Providing environmental legal advice to Eskom and its joint venture partner in a significant project related to the provision of energy in the Eastern Cape.
- Drafting opinions, reports and baseline reviews for a range of commercial clients dealing with different issues in environmental law, including atmospheric emissions, waste management, the entitlement to access to information, rehabilitation obligations in South Africa and the like.
- Providing strategic environmental legal advice on the new EIA Regulations promulgated under the national Environmental Management Act to a range of clients including provincial environmental departments and other organs of state like municipalities, environmental consultancies, corporate clients and individuals.
- Litigating in various divisions of the South African High Court on a range of opposed applications (including interdict applications and review proceedings) for a variety of clients including the City of Cape Town, the Petroleum Gas and Oil Corporation of South Africa (Pty) Ltd, individual clients and NGOs like WESSA and the Endangered Wildlife Trust.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

# **CURRICULUM VITAE**

**PETER GEOFFREY HAWKES**

## **PERSONAL DETAILS**

NAME: Peter Geoffrey Hawkes  
ORGANISATION: AfriBugs CC  
DATE OF BIRTH: 5 December 1964  
AGE: 44  
MARITAL STATUS: Married  
NATIONALITY: South African  
ID NUMBER: 641205 5202 080  
PASSPORT NUMBER: 434 754 672  
DRIVERS' LICENCES: Codes 01 (15.02.1984) and 08 (15.02.1984)  
(updated to new SA licences A1 & EB, 26.06.1998)  
LANGUAGES: English (excellent)  
Afrikaans (good)  
kiSwahili (limited)

## **SECONDARY EDUCATION**

1976-1978: Kingswood College, Grahamstown  
1979-1980: Waterford-Kamhlaba School, Mbabane  
1981: Woodridge College, Port Elizabeth:  
Awarded Academic Honours  
Top 100 in National Youth Science Olympiad  
National Senior Certificate (JMB exemption):  
A-aggregate, distinctions in Science and English

## **TERTIARY EDUCATION**

1982-1984: Rhodes University, Grahamstown:  
Bsc (Entomology and Biochemistry):  
Distinction in Entomology (awarded Academic Half-Colours)  
1985: Rhodes University, Grahamstown:  
BSc(Hons):  
Distinction in Entomology (awarded Academic Colours)  
1986-1998: University of the Witwatersrand, Johannesburg:  
Engaged in research towards a PhD in Zoology  
Field of study: Sex ratios in hymenopteran parasitoids

## SCHOLARSHIPS

William Waddell Trust (1984, 1985)  
Duerden Scholarship (1985)  
FRD Honours Bursary (1985)  
Rhodes University Honours Bursary (1985)  
Freda Lawenski Scholarship (1986, 1990)  
FRD Masters Bursary (1986, 1987)  
Wits University Senior Bursary (1986, 1987)  
FRD PhD Bursary (1988, 1989)  
Wits University Senior Bursary (1988, 1990)

## CONFERENCE PROCEEDINGS

Hawkes, P.G. (1989), Male aggression in *Eupelmus orthopterae* Risbec (Hymenoptera: Eupelmidae). *Proceedings of the Seventh Congress of the Entomological Society of Southern Africa, 10-13 July 1989*, p65.

Crewe, R.M. and P.G. Hawkes (1992), Bouquets and blends: analysis of behavioural and physiological responses to exocrine secretions of *Camponotus*. 19th International Congress of Entomology, Beijing, China, 28 June-4 July, *Proceedings of the 19th International Congress of Entomology*, p192.

Hawkes, P.G. (2003), Diet of the Blue Swallow and food availability in relation to habitat type and weather. *Proceedings of the 14<sup>th</sup> Entomological Congress, organised by the Entomological Society of Southern Africa, Pretoria 7-9 July 2003*, p35.

Hawkes, P.G. (2003), Insect indicator groups in biodiversity evaluation and monitoring. *Proceedings of the 14<sup>th</sup> Entomological Congress, organised by the Entomological Society of Southern Africa, Pretoria 7-9 July 2003*, p36.

Hawkes, P.G. (2003), Diet of the Kihansi Spray Toad (*Nectophrynoides asperginis*), the world's most endangered frog. *Proceedings of the 14<sup>th</sup> Entomological Congress, organised by the Entomological Society of Southern Africa, Pretoria 7-9 July 2003*, p36.

## PUBLICATIONS AND REPORTS

Hawkes, P.G. (1980), Notes on growth and sloughing in a captive night adder (*Causus rhombeatus*). *Journal of the Herpetological Society of Africa* **23**, pp4-6.

Motara, M.A. and P.G. Hawkes (1985), Meiosis in the Eastern Cape grasshopper *Phymateus leprosus* (Orthoptera: Pyrgomorphidae). *Journal of the Entomological Society of Southern Africa* **48**(2), pp217-221.

- Hawkes, P.G. (1992), Sex ratio stability and male-female conflict over sex ratio control in hymenopteran parasitoids. *South African Journal of Science* **88**, pp423-430.
- Hawkes, P.G. (1995), Report on a preliminary investigation of the potential impact of the Lower Kihansi Hydropower Project on the insect fauna. *Lower Kihansi Hydropower Project, Environmental Impact Assessment*. Tanzania Electric Supply Company Limited.
- Hawkes, P.G. 1998. Lower Kihansi Hydropower Project: Long-term monitoring. Entomological component: Interim report 1; Results of October 1997 collections. Report for NORPLAN/Tanzania Electric Supply Company Ltd. (TANESCO), Dar es Salaam, Tanzania.
- Hawkes, P.G. 1998. Lower Kihansi Hydropower Project: Long-term monitoring. Entomological component: Interim report 2; Results of October 1998 collections. Report for NORPLAN/Tanzania Electric Supply Company Ltd. (TANESCO), Dar es Salaam, Tanzania.
- Hawkes, P.G. 2000a. Lower Kihansi Hydropower Project: Long-term monitoring. Entomological component: Interim report 3; Results of October 1999 collections. Report for NORPLAN/Tanzania Electric Supply Company Ltd. (TANESCO), Dar es Salaam, Tanzania.
- Hawkes, P.G. 2000b. Lower Kihansi Hydropower Project: Long-term monitoring. Entomological component: Preliminary report on October 2000 collection trip. Report for NORPLAN/Tanzania Electric Supply Company Ltd. (TANESCO), Dar es Salaam, Tanzania.
- Hawkes, P.G. 2000c. Blue Swallow Diet Study: Report on Phase 1. Report prepared for Birdlife South Africa/Endangered Wildlife Trust, South Africa.
- Hawkes, P.G. 2001. Lower Kihansi Hydropower Project: Long-term monitoring. Entomological component: Interim report 4; Results of October 2000 collections. Report for NORPLAN/Tanzania Electric Supply Company Ltd. (TANESCO), Dar es Salaam, Tanzania.
- NORPLAN, 2001a. *Lower Kihansi Hydropower Project. Immediate Rescue and Emergency Measures. Report on Site Visit & Planning for IREM - Insect Studies*. Report prepared for Tanzania Electric Supply Company Ltd. (TANESCO), Dar es Salaam, Tanzania
- NORPLAN, 2001b. *Lower Kihansi Hydropower Project. Immediate Rescue and Emergency Measures. Entomology Field Report, May 2001*. Report prepared for Tanzania Electric Supply Company Ltd. (TANESCO), Dar es Salaam, Tanzania
- NORPLAN, 2001c. *Lower Kihansi Hydropower Project. Immediate Rescue and Emergency Measures. Entomology Field Report, July 2001*. Report prepared for Tanzania Electric Supply Company Ltd. (TANESCO), Dar es Salaam, Tanzania
- NORPLAN, 2001d. *Lower Kihansi Hydropower Project. Immediate Rescue and Emergency Measures. Entomology Field Report, September 2001*. Report prepared for Tanzania Electric Supply Company Ltd. (TANESCO), Dar es Salaam, Tanzania
- NORPLAN, 2001e. *Lower Kihansi Hydropower Project. Immediate Rescue and Emergency Measures. Additional Entomological Studies 2000/2001*. Report prepared for Tanzania Electric Supply Company Ltd. (TANESCO), Dar es Salaam, Tanzania

- NORPLAN, 2001f. *Lower Kihansi Hydropower Project. Immediate Rescue and Emergency Measures. Entomology Field Report, October 2001*. Report prepared for Tanzania Electric Supply Company Ltd. (TANESCO), Dar es Salaam, Tanzania
- NORPLAN, 2001g. *Lower Kihansi Hydropower Project. Long-term Environmental Monitoring Programme. Final Report - Entomological Component*. Report prepared for Tanzania Electric Supply Company Ltd. (TANESCO), Dar es Salaam, Tanzania
- NORPLAN, 2001h. *Lower Kihansi Hydropower Project. Immediate Rescue and Emergency Measures. Final Specialist Report: Entomology*. Report prepared for Tanzania Electric Supply Company Ltd. (TANESCO), Dar es Salaam, Tanzania
- Hawkes, P.G. 2003a. *Entomological survey report, February/March 2001*. Report produced for De Beers Mining Company Ltd. (De Beers), Cullinan, South Africa.
- NORPLAN 2003a. *Entomology field report, September 2002*. Report produced for Lower Kihansi Environmental Management Project (LKEMP), Dar es Salaam, Tanzania.
- NORPLAN 2003b. *Lower Kihansi Hydropower Project: Lower Kihansi Environmental Management Project. Long-term Environmental Monitoring. Entomology Field Report, September 2002*. Report produced for Lower Kihansi Environmental Management Project (LKEMP), Dar es Salaam, Tanzania.
- NORPLAN 2003c. *Lower Kihansi Hydropower Project: Lower Kihansi Environmental Management Project. Draft Final Report: Intermittent High Flow Manipulations and Ecological Studies*. Report produced for Lower Kihansi Environmental Management Project (LKEMP), Dar es Salaam, Tanzania.
- Hawkes, P.G. 2003b. *Blue Swallow Diet Study: Phase II - Insect abundance at the Kaapse Hoop BSNHS, September-December 2002*. Report produced for the Endangered Wildlife Trust - Blue Swallow Working Group, Johannesburg, South Africa.
- Hawkes, P.G. 2004a. *Assessment of the Hadogenes gunningi population at the proposed Mount Grace Hotel development site*. Report produced for Eco Assessments CC, Johannesburg, South Africa.
- Hawkes, P.G. 2004b. *Invertebrate Assessment of the proposed Blair Athol Country Estate site*. Report produced for Ecological Management Services, Kimberly, South Africa.
- Hawkes, P.G. 2005. *Invertebrate Assessment of the proposed Olifantsfontein sand mining site*. Report produced for Umhlaba Environmental Consulting CC, Johannesburg, South Africa.
- Hawkes, P.G. 2006a. *Coega ant community analysis*. Report prepared for African Sky Projects (Pty) Ltd, Pretoria, South Africa.
- Hawkes, P.G. 2006b. *Invertebrate assessment of the proposed Fort West Village site*. Report prepared for Rob Taylor and Associates, Johannesburg, South Africa.
- Hawkes, P.G, Zilihona, I.J.E. and Ndangalasi, H.J. 2006. *Host plant use of Kihansi spray wetland indicator insect species*. Report produced for Lower Kihansi Environmental Management Project (LKEMP), Dar es Salaam, Tanzania.

- Hawkes, P.G. 2006c. *Invertebrate assessment of the Gomes Zimbiwa Sand and Stone mining site*. Report prepared for Umhlaba Environmental Consulting CC, Johannesburg, South Africa.
- Hawkes, P.G. 2006d. *Invertebrate assessment of the proposed development on Zwartkoppies 364JR*. Report prepared for Rob Taylor and Associates, Johannesburg, South Africa.
- Hawkes, P.G. 2006e. *Repeat Invertebrate Assessment of the proposed Sterrewag Ext. 3 sewer line tie-in in the Groenkloof Nature Reserve*. Report prepared for KWP Landscape Architects, Pretoria, South Africa.
- Channing, A, Finlow-Bates, K.S., Haarklau, S.E. and Hawkes, P.G. (2006). The biology and recent history of the critically endangered Kihansi Spray Toad *Nectophrynoides asperginis* in Tanzania. *Journal of East African Natural History* **95**(2) 117-138.
- Hawkes, P.G. 2007a. *Invertebrate Assessment of the proposed extension to the mining area at Willow Quarries, February 2007*. Report produced for Willow Quarries (Pty) Ltd., Pretoria, South Africa.
- Hawkes, P.G. 2007b. *Invertebrate Assessment of the KH-2 water pipeline alignment in the Groenkloof Nature Reserve*. Report prepared for African EPA, Pretoria, South Africa.
- Hawkes, P.G. 2007c. *Invertebrate Assessment of the KK 1, 2 & 3 water pipeline alignment on the Klapperkop ridge*. Report prepared for African EPA, Pretoria, South Africa.
- Hawkes, P.G. 2007d. *Invertebrate Assessment of the proposed Kommandonek development*. Report prepared for VC Management Services CC, Rivonia, South Africa.
- Hawkes, P.G. 2007e. *Invertebrate Assessment of the proposed Midwater Estate*. Report prepared for Rock Environmental Consulting CC, Pretoria, South Africa.
- Hawkes, P.G. and Edge, D.A. 2008. *Nuclear 1 EIA and EMP. Specialist study for Environmental Impact Assaessment. Specialist Study: Terrestrial Invertebrates*. Report produced for ARCUS GIBB, South Africa.

Note that 1) all reports listed under NORPLAN, with the exception of NORPLAN 2003c (jointly produced with several other authors) were prepared by me; most of these were subsequently incorporated in whole or in part into other reports (not listed here) produced by NORPLAN A.S for TANESCO, 2) reporting on many recent projects (2007-2008) has taken the form of compilation of sections within overall jointly authored reports submitted by the lead consultants concerned, and these reports are not listed above.

## **PROFESSIONAL REGISTRATION**

South African Council for Natural Scientific Professions: Professional Natural Scientist (Zoological Science): registration number 400411/04 (23 September 2004)

## **MEMBERSHIP OF SOCIETIES**

Entomological Society of Southern Africa: life member (1985- ).

Botanical Society of South Africa: life member (1986- ).

International Association for Impact Assessment South Africa (IAIASa) (2002-).

## **REVIEWING OF MANUSCRIPTS**

I have carried out peer review of scientific papers for:

African Journal of Ecology (member of international reviewer panel since 2008)

African Plant Protection

Journal of East African Natural History

South African Journal of Science

## **ADDITIONAL INFORMATION**

I am in excellent health and a keen hiker, camper and rock-climber and am thus well-suited to projects requiring field-work in remote areas. I have considerable experience with polyester resin casting, wood- and metal-working and related crafts and am able to custom-build equipment when required for specific projects. During my studies I worked as a vacation assistant on several projects, including the production of permanent insect displays, analysis of herbarium records for the Endangered Plants Project (CSIR, South Africa), maintaining cultures of numerous insect species and carrying out experimental work on several of these. Through this varied work experience, as well as through my studies and lifelong interest in insects and plants, I have developed an aptitude for collecting, cultivating and rearing a wide variety of species. I enjoy field-work and have a keen eye for unusual specimens in the field, and have collected specimens of numerous previously undescribed species of insects. I have over 28 years of experience in photography with an emphasis on macrophotography, and have built up a comprehensive set of equipment for this purpose. I have also developed micro-dissection and slide-mounting skills through my work on scale insects, parasitoid wasps and glandular secretions of ants. I work well under pressure and am capable of sustained intensive work.

My report-writing skills are excellent and I routinely use the Microsoft Office suite (mainly Word, Excel and Powerpoint) and Statistica, but am also familiar with Adobe Photoshop, CorelDraw and many other software programmes. I am currently involved in an informal collaborative project (with Dr Max Clark of African Sky Projects) on the development and evaluation of protocols using insect indicator groups for biodiversity assessments and rehabilitation monitoring in Southern Africa. In July 2003 I was invited to present a lecture on biodiversity for the SA Road Federation course on Integrated Environmental Management for the Roads Industry. I have worked extensively in the environmental field in Tanzania since 1994 and am familiar with the challenges of working in developing countries. I am currently the principal investigator and co-principal investigator respectively of two ongoing three-year research projects on insect biodiversity, one in Tanzania/Kenya and the other in Gauteng Province, South Africa.



## EMPLOYMENT & PROJECT HISTORY

Oct. 1994- Present: freelance environmental consulting (through AfriBugs CC since July 1999) including:

- Invertebrate assessment for Biodiversity Action Plan for Anglo Coal New Denmark Colliery (ongoing - September 2008 - April 2009), subcontracted by Nepid Consultants.
- Terrestrial invertebrates specialist study for ESKOM Nuclear 1 EIA and EMP (August - September 2008), subcontracted by Arcus Gibb.
- Survey for new *Afroxydris* ant species at Cullinan Diamond Mine (ongoing - August 2008 - ), contracted by Petra Diamonds.
- Survey of distribution of new *Camponotus* (sugar ant) species at proposed Everest North Platinum mine (ongoing - July 2008 - ), subcontracted by Metago Environmental Engineers.
- Invertebrate assessment for EMP and impact assessment of proposed opencast extensions at Two Rivers Platinum, Limpopo Province (ongoing - January 2008 - ) subcontracted by Ecorex.
- Invertebrate assessment of proposed Mohale's Gate development adjacent to Cradle of Humankind World Heritage Site (July - November 2007) subcontracted by Rob Taylor and Associates.
- Participation in the Population and Habitat Viability Assessment (PHVA) for the Kihansi Spray Toad, Bagamoyo, Tanzania, 14-17 May 2007. Invited by the Lower Kihansi Environmental Management Project, Tanzania.
- Invertebrate assessment of proposed Groot Letaba Water Resources Development Project, Limpopo Province (ongoing - April 2007 - ) subcontracted by Ecorex.
- Invertebrate assessment of proposed Kommandonek development, North-West Province (April - October 2007 ) subcontracted by VC Management Services CC.
- Invertebrate assessment of proposed KH-2 and KK1,2&3 water pipelines in the Groenkloof and Klapperkop Nature Reserves (February 2007 - August 2007); subcontracted by Insitu Pipelines.
- Invertebrate assessment of proposed Everest North Platinum Mine, Mpumalanga Province (ongoing - February 2007 - ) subcontracted by Ecorex.
- Entypesa ?schoutedeni relocation at Willow Quarries, Pretoria (April 2007). Contracted by Willow Quarries (Pty) Ltd., Pretoria, South Africa.
- Invertebrate assessment of the proposed extension to the mining area at Willow Quarries, Pretoria (February 2007). Contracted by Willow Quarries (Pty) Ltd., Pretoria, South Africa.
- Invertebrate assessment of proposed opencast extensions to Everest South Platinum Mine, Mpumalanga (November 2006 - February 2007) subcontracted by Ecorex.
- Invertebrate assessment of proposed VHL chrome mine, Mpumalanga (ongoing - September 2006 - )

- Invertebrate assessment of proposed Midwater Estate development, Gauteng (September 2006 - July 2007)
- Environmental compliance monitoring of Sterrewag Ext. 3 sewer line tie-in in the Groenkloof Nature Reserve (Oct 2006 May 2007); Contracted by Waterkloof Golf Estate.
- Invertebrate assessment of proposed sewer line tie-in in the Groenkloof Nature Reserve (June -Dec 2006); subcontracted by KWP Landscape Architects.
- Invertebrate assessment of the Gomes Zimbiwa Sand and Stone mining site (April 2006); subcontracted by Umhlaba Environmental consulting CC.
- Invertebrate assessment in the Waterpoort area of the Northern Soutpansberg (**ongoing**, April 2006 -); subcontracted by African Sky Projects (Pty) Ltd.
- Invertebrate assessment of the proposed development on Zwartkoppies 364JR (March-April 2006); subcontracted by Rob Taylor and Associates.
- Invertebrate assessment of the proposed Fort West Village site (February-March 2006); subcontracted by Rob Taylor and Associates.
- Red Data invertebrate scan of the National Chick Mooiplaats site (January 2006); subcontracted by P&N Environmental Development Consultants, Utrecht, South Africa.
- Assessment of ant communities at the Coega Industrial Development Zone (Dec 2005); subcontracted by African Sky Projects (Pty) Ltd.
- Invertebrate assessment relating to a mining right application on Oliantsfontein 402 IR (October 2005); subcontracted by Umhlaba Environmental consulting CC.
- Biodiversity assessment and monitoring of the insect fauna of the Eastern Arc Mountains and Coastal Forests hotspot using ground-dwelling ants and beetles as indicator groups. Principal Investigator; project in Tanzania & Kenya funded by the Critical Ecosystem Partnership Fund; **ongoing**, April 2005 - September 2008.
- Gauteng Insect Biodiversity Project funded by Ernest Oppenheimer & Sons; **ongoing**, January 2005-December 2007.
- Host plant use of Kihansi spray wetland indicator insect species. Research project carried out on behalf of Lower Kihansi Environmental Management Project, Dar es Salaam, Tanzania (May 2005 - May 2006).
- Invertebrate assessment of a proposed sand quarry on Olifantsfontein farm (February-March 2005); subcontracted by Umhlaba Environmental consulting CC.
- Compilation of South African International Pollinator Initiative stocktaking report (November-December 2004); subcontracted by African Sky Projects (Pty) Ltd.
- Invertebrate assessment of the proposed Blair Athol Country Estate site (October 2004); subcontracted by Ecological Management Services.
- Expert evidence at BioWatch/Syngenta Bt11 maize appeal hearing (September 2004); contracted by BioWatch.

- Assessment of the *Hadogenes gunningi* population at the proposed Mount Grace Hotel development site (March 2004); subcontracted by Eco Assessments CC.
- Lower Kihansi Environmental Management Project (Sept 2002 – Sept 2003); subcontracted by Norplan A.S.
- Blue Swallow Dietary Study Phase II (June 2002 – Dec 2003) on behalf of the Endangered Wildlife Trust (Private bag X11, Parkview 2122, South Africa)
- Immediate Rescue and Emergency Measure Project for the Lower Kihansi Hydropower Project in Tanzania (Jan 2001 – June 2002); subcontracted by Norplan A.S.
- Environmental Impact Assessment and baseline data collection for rehabilitation trials at the De Beers Premier Diamond Mine in Cullinan, South Africa (Feb 2001 - Feb 2002).
- Blue Swallow Dietary Study Phase I (April 1999 – December 2000) on behalf of the Endangered Wildlife Trust (Private bag X11, Parkview 2122, South Africa)
- Environmental Management Programme Report compilation (May 1998 –), on behalf of Clean Stream Environmental Services (433 Durr Street, Waterkloof Glen, Pretoria, South Africa).
- Environmental impact assessment (Oct 1994) and longterm monitoring (Dec 1996 – Dec 2001) of the Lower Kihansi Hydropower Project in Tanzania; subcontracted by Hydrosphere Resource Consultants and Norplan A.S.

Apr. 1992- Dec 1994: University of the Witwatersrand: Department of Zoology

- Research Assistant (part-time):  
Experimental work on behavioural and metabolic responses of ants (*Camponotus* and *Crematogaster spp.*) to their exocrine secretions. Collection and maintenance of colonies of *circa* 12 species of ants and maintenance of cultures of isopods, millipedes, termites and cockroaches used as food sources. Assistance with field and experimental work and supervision of Honours degree students.

Jan. 1992-Mar. 1992: University of the Witwatersrand: Department of Zoology

- Vacation Assistant:  
Experimental work on *Camponotus brevisetosus* behavioural responses to exocrine secretions, maintenance of ant colonies and cultures of food organisms.

Dec. 1983-Jan. 1984: Rhodes University: Department of Zoology and Entomology

- Vacation Assistant:  
Culture of, and experimental work on, scale insects (*Saissetia oleae*) and their parasitoids (*Coccophagus bartletti*) on potato sprouts and Natal Mahogany (*Trichilia emetica*).

Dec. 1982-Feb. 1983: Albany Museum and Rhodes University: Department of Botany

- Vacation Assistant:  
Analysis of herbarium records and specimens for the Endangered Plants Project, CSIR.

Dec. 1981-Jan.1982: Rhodes University: Department of Zoology and Entomology

- Vacation Assistant:

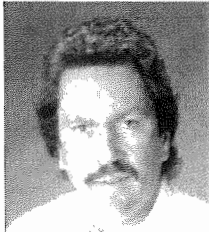
Collection and identification of insect specimens and production of permanent insect displays.

## REFERENCES

1. John H. Gerstle  
Hydrosphere Resource Consultants  
1002 Walnut St., Suite 200  
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Administrative Building # 410  
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e-mail: [robin.crewe@up.ac.za](mailto:robin.crewe@up.ac.za)

## Peter Rosewarne

Principal Consultant



**Profession:** Hydrogeologist

**Education:** MSc (Hydrogeology), Rhodes, 1984  
BSc Hons (Geol), London, 1974

**Registrations/  
Affiliations** Pr Sci Nat (South Africa) 401474/83  
Member IAH (Exec Comm SA Chapter 1999-2004)  
Ground Water Division of the SA Geological Society,  
(Western Cape Representative 1989 – 1990)  
Member Institute of Waste Management  
Member Water Institute of South Africa

**Specialisation:** Nuclear sites investigation: Groundwater resource evaluation; wellfield development and management; hydrogeological mapping; subsurface contamination; mine and construction dewatering; waste disposal site selection.

### Expertise:

Peter Rosewarne has been involved in groundwater for the past 32 years. His expertise includes:

- Nuclear sites investigations, including licensing of candidate sites, quality guides and waste disposal;
- Evaluation and development of major aquifers, e.g. dolomites, Table Mountain Group, coastal aquifers;
- Municipal groundwater supply, groundwater resource evaluation and wellfield development, groundwater management, geological and hydrogeological mapping, coastal aquifer development;
- Mine and construction site dewatering, mine hydrogeological studies, mine water inflow reviews, subsidence risk assessment due to dewatering, and dewatering feasibility studies using computer modeling;
- Conceptualisation of hydrogeological problems;
- Subsurface contamination;
- Waste disposal site investigations;
- Numerical Modelling
- Project management.

### Employment Record:

**1982 – Present** SRK Consulting. Senior to Principal Hydrogeologist.  
**1977 – 1982** Department of Water Affairs, Division of Geohydrology. Senior Hydrologist  
**1976 – 1977** Geological Survey of South Africa, Groundwater Section. Hydrogeologist.  
**1975 – 1976** Geological Survey of South Africa, Regional Section. Geologist.

**Publications:** Numerous publications on groundwater

**Languages:** English

## Peter Rosewarne

### Publications:

1. ROSEWARNE PN, WOODFORD A and GIRMAN J (2006). The Quest for Quantification of South Africa's Groundwater Resources. Hydrological Association of Namibia Conference, Windhoek.
2. WOODFORD A, ROSEWARNE PN and GIRMAN J (2006). How much Groundwater does South Africa Have? 59<sup>th</sup> Canadian Geotechnical Conference, 7<sup>th</sup> Joint CGS/IAH-CNC Groundwater Speciality Conference, Vancouver Canada.
3. O' BRIEN R and ROSEWARNE PN (2006). Characterisation and Remediation at the AECI Somerset West Site. Wastecon 2006, Cape Town.
4. ROSEWARNE PN, WOODFORD A and GIRMAN J (2005). How much Groundwater Does South Africa Have? SANCIAHS Conference, Midrand.
5. ROSEWARNE PN (2005): "Groundwater Use and Availability in South Africa". Biennial Groundwater Conf. Pretoria.
6. GIRMAN J and ROSEWARNE PN (2005): National Groundwater Resource Assessment: Phase 2". Biennial Groundwater Conf. Pretoria.
7. FORTUIN M, WOODFORD AC, ROSEWARNE PN and LOW AB (2004). Identification and Prioritisation of Type Areas for Detailed Research in Terms of the Regional Variability of the Groundwater and Ecological Characteristics of the Table Mountain Group Aquifer Systems. Water Research Commission Report no 1332/1/04, Pretoria.
8. ROSEWARNE PN (2002): "The Table Mountain Group Aquifer and its Potential for Supplementary Water Supply for Cape Town". IMIESA Vol 27 No 1.
9. PIETERSEN K and PARSONS R (Ed) (ROSEWARNE PN, key contributions). (2002). A Synthesis of the Hydrogeology of the Table Mountain Group – Formation of a Research Strategy. Water Research Commission Report no TT158/01, Pretoria.
10. ROSEWARNE PN and HAINES A (1999): "The Use of Quarries as Water Storage Reservoirs". Institute of Quarrying Annual Conf. Durban.
11. ROSEWARNE PN (1998): "Waste Disposal and Groundwater Supply: Services in Conflict". Urban Management Vol 29, No 10.
12. ROSEWARNE PN and MILLS E (1997): "The Use of Geophysical Techniques to Site High Yielding Water Supply Boreholes". South African Geophysical Association Conf. Swakopmund.
13. ROSEWARNE PN, LOMBERG C and KENDAL K (1996): "Application of Minimum Requirements: Case Studies from Port Elizabeth". Wastecon 96. Durban.
14. LOMBERG CR, ROSEWARNE PN, RAYMER DA and DEVEY DG (1996). Research into Groundwater Abstraction in the Port Elizabeth Municipal Area.
15. ROSEWARNE PN, LANGTON CL and DEVEY G (1993): "Aquifer Protection: The Port Elizabeth Experience". Int Groundwater Symp. Johannesburg.
16. ROSEWARNE PN (1993): "The Role of the Consultant in Water Resources Investigations". Municipal Engineer, Vol 24 No 7.
17. ROSEWARNE PN (1991): "Villiersdorp Tracer Project". Biennial Groundwater Convention. Johannesburg.
18. ROSEWARNE PN (1991): "Planning of Municipal Groundwater Supplies". Municipal Engineer.

19. ROSEWARNE PN, SMART M and BALZER T (1987): "Hydrogeological mapping of the Republic of Ciskei". Hydrological Sci Symp. Grahamstown.
20. ROSEWARNE PN and CONNELLY RJ (1984): "Groundwater development in the Transvaal Dolomites". Int Conf on Groundwater Technology. Johannesburg
21. BRACKLEY I, ROSEWARNE PN and GRADY L (1984): "Prediction of Surface Subsidence Caused by Lowering the Water Table in Dolomite". 3<sup>rd</sup> Int Symp on Land Subsidence. Venice.

**Key Experience:****Peter Rosewarne****Hydrogeological/General Studies**

Name of Project: Nuclear 1  
 Client: Eskom/Arcus Gibb  
 Location: South Africa  
 Project Description: EIA  
 Project duration/date: 2007 – 2008  
 Value of Project: Confidential  
 Job Title and Duties: Specialist groundwater studies

Name of Project: Nuclear 1 sites licensing investigation  
 Client: Eskom  
 Location: South Africa  
 Project Description: Assessment of suitability of three sites for licensing  
 Project duration/date: 3 years  
 Value of Project: Confidential  
 Job Title and Duties: Project Manager and Technical Input

Name of Project: Nuclear Sites Investigation Programme Phase 1  
 Client: Eskom  
 Location: South Africa  
 Project Description: Production of a Quality Manual and Business Case for Phase 2  
 Project Duration: 5 months  
 Value of Project: R 1 million  
 Job Title and Duties: Project Manager and technical input

Name of Project: Pebble Bed Modular Reactor  
 Client: Eskom/Arcus Gibb  
 Location: Western Cape Province, South Africa  
 Project Description: EIA  
 Project duration/date: 2007-2008  
 Value of Project: Confidential  
 Job Title and Duties: Specialist groundwater study

Name of Project: WR 2005  
 Client: Water Research Commission  
 Location: South Africa  
 Project Description: Updating and determining the surface water and groundwater resources of South Africa  
 Project duration/date: 2005-2007  
 Value of Project: ZAR 7 Million  
 Job Title and Duties: Project leader: Groundwater

Name of Project: Groundwater Resource Evaluation phase 2  
 Client: DWAF  
 Location: South Africa  
 Project Description: Evaluation of groundwater quantity; planning potential map; recharge; groundwater-surface water interaction; aquifer classification; groundwater use.  
 Project duration/date: 2003 – 2005  
 Value of Project: ZAR 2.6 million  
 Job Title and Duties: Project manager and technical input



**Key Experience:****Peter Rosewarne****Hydrogeological/General Studies**

Name of Project: Karoo Aquifers Characterisation  
 Client: Water Research Commission  
 Location: South Africa  
 Project Description: Determining the hydrogeological characteristics of the Karoo aquifers of the Eastern Cape  
 Project duration/date: 2005 – 2007  
 Value of Project: ZAR 3.5 million  
 Job Title and Duties: Project Manager

Name of Project: Vaal River System: Reconciliation strategies  
 Location: DWA  
 Project Description: Gauteng and Northern Cape Province, South Africa  
 Project duration/date: Determining the current and potential surface and groundwater resources of the Vaal Basin WMA  
 Value of Project: 2005-2006  
 Job Title and Duties: ZAR 7.5 million  
 Determining the groundwater potential of the dolomite aquifers of the Vaal Basin WMA

Name of Project: Building Block 6: Water and Environmental Issues  
 Client: World Bank  
 Location: Mozambique  
 Project Description: Integrated water resources assessment in southern Mozambique  
 Project duration/date: 2004  
 Value of Project: US\$100 000  
 Job Title and Duties: Project hydrogeologist

Name of Project: Koo Valley irrigation scheme  
 Client: Koo Irrigation Board  
 Location: Montagu, Western Cape Province, South Africa  
 Project Description: Development of wellfield to yield 2 million m<sup>3</sup>/a for emergency irrigation water.  
 Project duration/date: 2001 - 2003  
 Value of Project: ZAR 4 million  
 Job Title and Duties: Project manager and technical input

Name of Project: Preliminary hydrogeological map and atlas  
 Client: SADC Water Sector  
 Location: SADC Region – 14 countries  
 Project Description: Review of situation in SADC countries and compilation of a report recommending the way forward.  
 Project duration/date: 2001 - 2002  
 Value of Project: ZAR 750 000  
 Job Title and Duties: Project manager and technical input

Name of Project: Handbook on Hydrogeology of the TMG Aquifer  
 Client: Water Research Commission  
 Location: Western and Eastern Cape Provinces, South Africa  
 Project Description: Definition of hydrogeological properties of the TMGA and case studies  
 Project duration/date: 2001  
 Value of Project: ZAR 750 000  
 Job Title and Duties: Key technical input

**Key Experience:****Peter Rosewarne****Hydrogeological/General Studies**

Name of Project: Citrusdal artesian groundwater exploration  
 Client: DWAF  
 Location: Citrusdal, Western Cape Province, South Africa  
 Project Description: Investigation and evaluation of artesian groundwater occurrence in the Olifants River Catchment, the so-called CAGE project.  
 Project duration/date: 1998 – 2001  
 Value of Project: ZAR 1 million  
 Job Title and Duties: Technical input on TMG hydrogeology

Name of Project: Water Master Plan: Hex Valley  
 Client: Hex Valley Irrigation Board  
 Location: Western Cape Province, South Africa  
 Project Description: Development of the groundwater component of a water master plan.  
 Project duration/date: 1997  
 Value of Project: ZAR 70 000  
 Job Title and Duties: Project manager and technical evaluation

Name of Project: Paaltjies Beach Well Feasibility Study  
 Client: World Bank  
 Location: Walvis Bay, Namibia  
 Project Description: Investigation and evaluation of the feasibility of developing shallow beach wells to supply a desalination plant  
 Project duration/date: 1997  
 Value of Project: ZAR 1 million  
 Job Title and Duties: Project Manager and hydrogeology

Name of Project: NW Namibia groundwater project  
 Client: DWAF (Nam)/African Development Bank  
 Location: North West Namibia  
 Project Description: Groundwater investigation, including characterization and quantification of resources and hydrogeological mapping in a 60 000 km<sup>2</sup> area.  
 Project duration/date: 1993 – 1997  
 Value of Project: ZAR 10 million  
 Job Title and Duties: Project manager and technical input

Name of Project: Wellfield development and management for the Municipalities of Elands Bay, Beaufort West, Graaff Reinet, Ceres, Hermanus, St Francis Bay, Paterson, Alexandria, Citrusdal, Jamestown, Kenton-on-Sea, Burgersdorp, Greyton, Botriver.  
 Client: Various  
 Location: Western Cape Province, South Africa  
 Project Description: Development of wellfields to yield up to 100 l/s for domestic use.  
 Project duration/date: 1985 - current  
 Value of Project: Various  
 Job Title and Duties: Borehole siting, drilling and test pumping supervision, data analysis and reporting.

Name of Project: Emergency groundwater supply for the PWV Area  
 Client: Rand Water Board / DWAF  
 Location: Gauteng Province, South Africa  
 Project Description: Development of wellfields to yield up to 600 l/s in the Transvaal Dolomites.  
 Project duration/date: 1984 - 1985  
 Value of Project: ZAR 6 million  
 Job Title and Duties: Project management and technical input

**Key Experience:****Peter Rosewarne****Mining**

- Name of Project: Ryst Kuil Uranium Mine Bankable Feasibility Study  
 Client: UraMin Inc  
 Location: Western Cape, South Africa  
 Project Description: Determining mine water control and supply measures and impact of mining on the environment  
 Project duration/date: 2007-2008  
 Value of Project: ZAR3 million  
 Job Title and Duties: Project Manager and technical input
- Name of Project: Jwaneng open pit dewatering review  
 Client: Debswana  
 Location: Botswana  
 Project Description: Review of dewatering work carried out and 5 year strategic plan  
 Project duration/date: 2007  
 Value of Project: ZAR0.3 million  
 Job Title and Duties: Project Manager and technical input
- Name of Project: Environmental impact of deepening and expanding a limestone quarry  
 Client: PPC  
 Location: Western Cape  
 Project Description: Numerical simulation of various pit sizes and depth regarding impact on the local groundwater regime  
 Project duration/date: 2007  
 Value of Project: ZAR150 000  
 Job Title and Duties: Project Manager and technical input
- Name of Project: Marula Platinum Mine Hydrogeological Studies  
 Client: Marula Platinum Mine  
 Location: Mpumalanga Province, South Africa  
 Project Description: Review of conceptual and numerical modeling and monitoring programme  
 Project duration/date: 2006  
 Value of Project: ZAR 350 000  
 Job Title and Duties: Review and technical input
- Name of Project: Murowa Diamond Mine hydrogeological study  
 Client: Rio Tinto  
 Location: Zimbabwe  
 Project Description: Groundwater resource assessment, dewatering design and contamination assessment.  
 Project duration/date: 2000  
 Value of Project: ZAR 1.5 million  
 Job Title and Duties: Project manager and technical input
- Name of Project: Sadiola open pit gold mine hydrogeological investigation  
 Client: AngloGold  
 Location: Mali  
 Project Description: Hydrogeological evaluation, design and installation of a dewatering system and mine water supply wellfield.  
 Project duration/date: 1999 – 2001  
 Value of Project: US\$100 000  
 Job Title and Duties: Project manager and technical input

**Key Experience:****Peter Rosewarne****Mining**

- Name of Project: De Hoek, Zoutkloof and Riebeeck West limestone quarries  
 Client: PPC  
 Location: Piketberg, Western Cape Province, South Africa  
 Project Description: Evaluation of end-use options for the above quarries, which included detailed pit water balance calculations and compilation of environmental management plan reports.  
 Project duration/date: 1997  
 Value of Project: ZAR 100 000  
 Job Title and Duties: Project manager and technical input
- Name of Project: Ujina, Rosario and Pullalli hydrogeological studies  
 Client: CMDIC  
 Location: Chile  
 Project Description: Conceptual and numerical modeling of inflows to open pit copper mines  
 Project duration/date: 1994 – 1996  
 Value of Project: US\$ 100 000  
 Job Title and Duties: Project manager and technical input
- Name of Project: Cooke 3 Section  
 Client: Randfontein Estates Gold Mine  
 Location: Gauteng Province, South Africa  
 Project Description: Prediction of the effects on structures of lowering of the water table by dewatering.  
 Project duration/date: 1983  
 Value of Project: ZAR100 000  
 Job Title and Duties: Senior hydrogeologist
- Name of Project: Phoenix, Tsikondeni and Amersfort coal mine hydrogeology  
 Client: Various  
 Location: Mpumalanga, Limpopo  
 Project Description: Hydrogeological assessment and inflow predictions for coal mines.  
 Project duration/date: 1982 - 1983  
 Value of Project: R250 000  
 Job Title and Duties: Senior hydrogeologist
- Name of Project: Block 1 open cast coal mine hydrogeological study  
 Client: Anglo American  
 Location: Vereeniging, Gauteng Province, South Africa  
 Project Description: Hydrogeological assessment, inflow prediction and dewatering design.  
 Project duration/date: 1982  
 Value of Project: R150 000  
 Job Title and Duties: Senior hydrogeologist
- Name of Project: Ryst Kuil Uranium Prospect  
 Client: UraMin Inc  
 Location: Beaufort West  
 Project Description: Determination of groundwater supply potential, pit inflows and environmental impacts of open pit and underground mining  
 Project duration/date: 2007-2008  
 Value of Project: ZAR5 million  
 Job Title and Duties: Project Manager and Technical Input

**Key Experience:****Peter Rosewarne****Mining**

Name of Project: Deepening of Riebeeck West limestone quarry  
Client: PPC  
Location: Western Cape  
Project Description: Assessment of increased groundwater inflows and environmental impacts of deepening and expanding the existing quarry  
Project duration/date: 2007  
Value of Project: ZAR155 000  
Job Title and Duties: Project Manager, numerical flow modelling

**Key Experience:****Peter Rosewarne****Subsurface Contamination and Waste Disposal**

- Name of Project: Chevron Underground Storage Tank Project  
 Client: Chevron  
 Location: South Africa  
 Project Description: Assessment of soil and groundwater contamination risk at retail sites  
 Project duration/date: 2006-2009  
 Value of Project: ZAR 1 million+  
 Job Title and Duties: Project manager and technical input
- Name of Project: High level nuclear waste repository  
 Client: Confidential  
 Location: South Africa  
 Project Description: Determining geological, structural and hydrogeological parameter values required for assessing the suitability of candidate sites for high level nuclear waste disposal  
 Project duration/date: Nov 2005 – February 2006  
 Value of Project: Confidential  
 Job Title and Duties: Determination of hydrogeological parameter values
- Name of Project: Saldanha Hazardous Waste Site Feasibility Study  
 Client: VDM Transport  
 Location: Western Cape Province, South Africa  
 Project Description: Establishment of baseline groundwater flow and quality to assess the feasibility of establishing a hazardous waste site near Saldanha  
 Project duration/date: 2005  
 Value of Project: ZAR 150 000  
 Job Title and Duties: Project manager and technical input
- Name of Project: Hazardous Waste Landfill Site  
 Client: Chevron  
 Location: Cacuaco, Angola  
 Project Description: Assessment of groundwater impacts from wastes from the off-shore oil industry  
 Project duration/date: 2003  
 Value of Project: USD \$600k  
 Job Title and Duties: Principal Hydrogeologist
- Name of Project: Spornet Storage Depot  
 Client: Spornet  
 Location: Cape Town, Western Cape Province, South Africa  
 Project Description: Site characterisation and remediation plan for hydrocarbon contamination  
 Project duration/date: 2000  
 Value of Project: ZAR 60 000  
 Job Title and Duties: Project manager and technical input
- Name of Project: Oilkol Recycling Depot  
 Client: Oilkol  
 Location: Virginia, Free State Province, South Africa  
 Project Description: Characterisation and remediation of contamination at oil recycling depot  
 Project duration/date: 1998  
 Value of Project: ZAR 75 000  
 Job Title and Duties: Project manager and technical input

**Key Experience:****Peter Rosewarne****Subsurface Contamination and Waste Disposal**

Name of Project: Groundwater monitoring  
 Client: Various  
 Location: Western Cape Province, South Africa  
 Project Description: Monitoring at Stellenbosch, Malmesbury, Arlington, Aloes Waste Disposal Sites  
 Project duration/date: 1995 -  
 Value of Project: Various  
 Job Title and Duties: Project manager and technical input

Name of Project: AECI Somerset West subsurface contamination  
 Client: AECI Limited  
 Location: Somerset West, Western Cape Province, South Africa  
 Project Description: Characterization and remediation at a 1200ha multi-purpose industrial site on which there was explosives, fertilizer, pesticides, acids and other chemicals production. Major contaminants include lead, arsenic, mercury, sulphur and explosives.  
 Project duration/date: 1994 - current  
 Value of Project: ZAR 5 million  
 Job Title and Duties: Project manager and technical input

Name of Project: Caltex Refinery  
 Client: Chevron  
 Location: Cape Town, Western Cape Province, South Africa  
 Project Description: Investigation on impacts of Refinery activities on soil and groundwater. Site characterisation and monitoring  
 Project duration/date: 1994. 2001-2003  
 Value of Project: USD 50k  
 Job Title and Duties: Project manager and technical input

Name of Project: Determination of candidate sites for sub-regional landfills  
 Client: Various  
 Location: Western, Northern and Southern Cape Provinces, South Africa  
 Project Description: Evaluation of soils, geology, land-use, surface and groundwater to locate candidate landfill sites for the West Coast District Council, Paarl, Breede River Winelands and Port Elizabeth  
 Project duration/date: 1994 -  
 Value of Project: Various  
 Job Title and Duties: Project manager and technical input

Name of Project: Characterisation of existing landfill sites for the Municipalities of Tulbach, Cape Town, Malmesbury, Prince Albert, Port Elizabeth, Elim, Gansbaai  
 Client: Various municipalities  
 Location: Western Cape Province, South Africa  
 Project Description: Investigation of soils, geology and groundwater conditions  
 Project duration/date: 1992 -  
 Value of Project: Various  
 Job Title and Duties: Hydrogeologist

**Key Experience:****Peter Rosewarne****Civils Dewatering**

Name of Project: Core Effluent Project:Chevron Refinery  
Client: Chevron  
Location: Cape Town, Western Cape Province, South Africa  
Project Description: Investigation of soil and groundwater properties for dewatering design  
Project duration/date: 2005  
Value of Project: ZAR 250 000  
Job Title and Duties: Project manager and technical input. Numerical modeling

Name of Project: Ngqura Harbour Development  
Client: National Ports Authority  
Location: Coega, Eastern Cape  
Project Description: Evaluation of dewatering design and monitoring  
Project duration/date: January 2003 to June 2004  
Value of Project: ZAR 750 000  
Job Title and Duties: Project manager and technical review

Name of Project: Cullinan Hotel  
Client: Murray and Roberts  
Location: Foreshore, Cape Town, Western Cape Province, South Africa  
Project Description: Determining the groundwater inflow potential and remedial measures for the basement excavation  
Project duration/date: 1998  
Value of Project: ZAR25 000  
Job Title and Duties: Project hydrogeologist



**Proposed Position:** Environmental Specialist

**Name of Firm:** ACER (Africa) Environmental Management Consultants

**Name of Staff:** Rolf-Dieter Heinsohn

**Profession:** Managing Director/Environmental Consultant

**Date of birth:** 18 November 1961

**Years with Firm/entity:** 17 years

**Nationality:** South African

**Membership in Professional Societies:**

South African Association of Botanists  
International Association of Impact Assessment (South African Chapter)  
South African Institute of Ecologists and Environmental Scientists

Certified Environmental Practitioner with the Interim Certification Board of South Africa  
Certified with the South African Council for Natural Scientific Professions (400442/04)

**KEY QUALIFICATIONS AND RELEVANT EXPERIENCE**

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17 years experience in:

- Environmental Impact Assessment
- Social Impact Assessment
- Monitoring and Evaluation
- Management of Public Participation Programmes
- Resettlement Planning and Implementation
- Project Management

**2009:** Project Manager: Transnet New Multi-Products Pipeline: Proposed Electrical Infrastructure for Pump Stations 1, 3, and 5 [Project Management and Environmental Impact Assessment] and Inland Terminal 2 [Project Management and Basic Assessment].

**2009:** iSimangaliso Wetland Park: involvement in the assessment of various developments within the park.

**2009** In Went Lodge: Water Infrastructure Training for SADC Officials

**2007/8:** Project Manager: Public Consultation Process for the Closure of Hillendale Mine, KwaZulu-Natal, South Africa. Exxarro Resources [Project Management; Management of Public Participation Programmes]

**2006/7/8:** Project Manager: Sheffield Estate. Proposed Residential Development at Sheffield Beach [Project Management; Environmental Impact Assessment; Management of Public Participation Programmes]

**2006/7/8/9:** Project Manager: Woodmead Estate. Proposed Residential Development at Shakaskraal [Project Management; Environmental Impact Assessment; Management of Public Participation Programmes]

**2006/7/8/9:** Project Leader: Eskom Gamma-Grassridge 765 kV Transmission Line and Gamma Sub-Station. Environmental Impact Assessment [Project Management; Environmental Impact Assessment; Management of Public Participation Programmes]

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- 2002-2009:** Project Management and Specialist Input on many and various projects within the Wetland Park such as Beach Driving and Beach Driving Technical Update; Infrastructure Development; Investment Sites; Buffer Zone Management; Tourism Study etc [Project Management]
- 2006/7/8/9:** Project Manager: Sasol Natural Gas Project, Mozambique. Offshore Exploration Damage Compensation. Sasol, South Africa [Resettlement Planning and Implementation; Project Management]
- 2005/6:** United Nations Environment Programme: Dams and Development Project. Compile Social Impact Assessment Report "UNEP DDP Compendium – Social Impact Assessment" [Social Impact Assessment]
- 2004/5/6/7:** Co-Team Leader for the Olifants River Water Resource Development Project Environmental Impact Assessment Module - Screening Phase [Environmental Impact Assessment; Project Management]
- 2003/4:** Project Director for Communications Support provided to Tigor-South Africa, KwaZulu-Natal, South Africa [Project Management]
- 2002/3/4/6/7:** Project Manager: Sasol Natural Gas Project, Mozambique. Damage Compensation and Resettlement. Sasol, South Africa [Resettlement Planning and Implementation; Project Management]
- 2002:** Team Leader: Public Participation Programme for the Decision Support Phase of the Thukela Water Project, KwaZulu-Natal, South Africa. Department of Water Affairs & Forestry, South Africa [Management of Public Participation Programmes]
- 2002:** Project Manager: Beluluane Industrial Park Environmental Update Analysis, Maputo Province, Mozambique. Centre for Investment Promotion, Mozambique [Environmental Impact Assessment; Project Management]
- 2002:** External Reviewer: Environmental Impact Assessment for the proposed raw water pipeline from the Thukela River to Fairbreeze Mine, KwaZulu-Natal. Mhlathuze Water, South Africa [Environmental Impact Assessment]
- 2001:** Socio-economic Specialist for the Four District Centres Water Supply and Sanitation Study, Mozambique. Department of Water Affairs, Mozambique [Social Impact Assessment]
- 2001:** Supervision of staff on the Sasol Gas Fields Public Health and Social Pathology Specialist Study, Inhambane Province, Mozambique. Sasol, South Africa [Social Impact Assessment; Project Management]
- 2000:** Project Manager for the Social Impact Assessment for the proposed development of the Murowa Mine, Zvishavane District, Zimbabwe. RioTinto, Zimbabwe and England [Social Impact Assessment; Resettlement Planning and Implementation; Project Management]
- 2000:** Project Manager for the Public Involvement Programme and Social Impact Assessment for the proposed expansion to the Hillside Aluminium Smelter, Richards Bay, KwaZulu-Natal. Billiton, South Africa [Management of Public Participation Programmes; Social Impact Assessment]
- 1999 – 2002:** Project Leader: Monitoring and Evaluation of people affected by resettlement due to the establishment of the MOZAL Aluminium Smelter. Mozal Community Development Trust, Mozambique [Monitoring and Evaluation; Project Management]
- 1999:** Project Leader overseeing resettlement action plan for Maragra Commercial, Maragra Sugar. International Finance Corporation, Washington D.C. United States of America [Resettlement Planning and Implementation; Project Management]
- 1998:** Team Leader for the Social Impact Assessment for the proposed MOZAL Aluminium Smelter, Maputo, Mozambique. Billiton, South Africa [Social Impact Assessment]
- 1998:** Project Leader for the N3 Toll Road Public Involvement Programme and Social and Socio-economic assessment. N3 Toll Concession Limited, South Africa [Management of Public Participation Programmes; Social Impact Assessment; Project Management]
- 1998:** Project Leader: Environmental Impact Assessment for the proposed expansion of Komati Sugar Mill, Mpumalanga, South Africa. Transvaal Sugar Limited, South Africa [Environmental Impact Assessment; Project Management]
- 1998:** Project Director: Environmental Impact Assessment for the proposed Mdluli Hilton Lodge, Mpumalanga, South Africa. Team Development Concepts (Pty) Limited and Hilton Hotels [Environmental Impact Assessment; Project Management]

- 1998:** Project Director: Social Impact Assessment for the proposed Sun International Hotel development, Livingstone, Zambia. CSIR, South Africa [Social Impact Assessment]
- 1997 - 2000:** Overseeing project staff conducting resettlement action plan in the Beluluane Industrial Park, Mozal Aluminium Smelter, Mozambique. Billiton, South Africa [Resettlement Planning and Implementation; Project Management]
- 1997 - 2000:** Team Leader: Public Participation Programme for the Feasibility Phase of the Thukela Water Project, KwaZulu-Natal. Department of Water Affairs & Forestry, South Africa [Management of Public Participation Programmes]
- 1997:** Project Leader to report on investigation into Land Reform in South Africa for the Natal Agricultural Union. Development Bank of Southern Africa [Project Management]
- 1997:** Project Leader for the Agricultural Appraisal Report for the Lubombo Spatial Development Initiative for the South African Department of Transport [Project Management]
- 1997:** Project Leader in charge of the resettlement of farm labourers from the basin of the Qedusizi Dam for the Department of Land Affairs and the Department of Water Affairs and Forestry, South Africa [Resettlement Planning and Implementation; Project Management]
- 1997:** Team Leader: Social Impact Assessment for the proposed Iscor Heavy Minerals Smelter, Empangeni, KwaZulu-Natal. Iscor Heavy Minerals, South Africa [Social Impact Assessment]
- 1997:** Facilitation of development of multiple resource utilisation strategy for Mondi Forests, South Africa [Project Management]
- 1997:** Team Leader: Agricultural component of the Lubombo Spatial Development Initiative, South Africa and Swaziland. South African Department of Transport [Project Management]
- 1997:** Project Leader for the Monitoring and Evaluation of three Presidential Lead Projects (water supply and sanitation). Department of Water Affairs & Forestry, South Africa [Monitoring and Evaluation]
- 1997:** Project Leader to establish a Public Involvement Network to support proposed mining initiatives for Iscor Heavy Minerals, South Africa [Management of Public Participation Programmes]
- 1996:** Team Leader: Social and institutional evaluation of 13 primary water projects as part of an extensive and intensive external evaluation of the Mvula Trust and its activities. Mvula Trust, South Africa [Monitoring and Evaluation]
- 1996:** Team Leader: Social Impact Assessment for downstream impacts for the Mount Pleasant Dam, KwaZulu-Natal. Department of Water Affairs & Forestry, South Africa [Social Impact Assessment]
- 1994 - 1998:** Social Impact Assessment and impact monitoring for the upgrading of Witvlag Road to black-top standards. Development Bank of Southern Africa [Social Impact Assessment; Monitoring and Evaluation]
- 1994 - 1997:** Project Leader for the Nkomazi Irrigation Expansion Programme Initial environmental assessment of Sibange, Luggedlane and Walda Weirs in Mpumalanga, South Africa. Eastern Transvaal Department of Agriculture, South Africa [Environmental Impact Assessment]
- 1993 - 1996:** Project Co-ordinator for the Public Involvement Programme (Reconnaissance and Pre-feasibility studies) for the Thukela Water Project, KwaZulu-Natal. Department of Water Affairs and Forestry, South Africa [Management of Public Participation Programmes]
- 1993 - 1996:** Team Leader: Reconnaissance and Pre-feasibility Social Assessments of the Thukela Water Project, KwaZulu-Natal. Department of Water Affairs & Forestry, South Africa [Social Impact Assessment]

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**EDUCATION**
**University**

- 1987 - 1991** : Part-time PhD student at the University of Natal, Durban. Completed December 1991. Degree awarded March 1992  
Supervisor: Prof N W Pammenter
- 1984 - 1986** : Full-time MSc student at the University of Natal Durban. Converted to PhD  
Supervisor: Prof N W Pammenter
- 1983** : University of Natal, Durban. Completed a BSc (Honours) - *Cum Laude* in Plant Physiology and Plant Growth and Development  
Supervisors: Prof N W Pammenter, Dr G Campbell & Dr M Smith
- 1980 - 1982** : University of Natal, Pietermaritzburg - obtaining a BSc with major subjects Botany and Microbiology

**Matriculated**

1979 : Westville Boys' High School, Durban, South Africa. Aggregate: A

## EMPLOYMENT RECORD

**Present** : **Agricultural, Community, Environmental and Rural Development Consultants (Pty) Ltd. t/a ACER (Africa) Environmental Management Consultants**  
Managing Director

In July 2001, elected Chief Executive Officer of MBB Services International (Pty) Limited, holding company of ACER (Africa)

**1991** : Research Fellow, Institute of Natural Resources, University of Natal, Pietermaritzburg

**1990** : National Service for S A D F. 2 nd Lieutenant South African Medical Services. Seconded to the Department of Development Aid to continue research under the auspices of the Institute of Natural Resources

**1988 - 1990** : Research Fellow, Institute of Natural Resources, University of Natal, Pietermaritzburg

**1984 - 1987** : Farm Manager, Mount Sheba Nature Reserve, Pilgrims Rest

**1983** : Chemistry Teacher (Part time). Cambridge College, Durban

## LANGUAGE SKILLS

Language	Reading	Speaking	Writing
English	Excellent	Excellent	Excellent
Afrikaans	Excellent	Excellent	Excellent
German	Good	Good	Fair
Zulu	None	Fair	None

A detailed listing of publications is available on request

## CERTIFICATION

I, the undersigned, certify that to the best of my knowledge and belief, these data correctly describe me, my qualifications and my experience.

\_\_\_\_\_  
*Signature of staff member and authorised representative of the firm*

\_\_\_\_\_  
*Date (Day / Month / Year)*

Full name of staff member:

Rolf-Dieter Heinsohn

Full name of authorised representative: Rolf-Dieter Heinsohn



## Curriculum Vitae

### Rhys Giljam, Environmental Consultant – WSP Environmental

#### Professional Qualifications

- MSc (Physical Oceanography), University of Cape Town, 2002.
- Bachelor of Science (Honours) in Physical Oceanography, University of Cape Town, 2000.
- Bachelor of Science (Majors: Ocean & Atmospheric Science and Environmental & Geographical Science), University of Cape Town, 1999.

#### Professional Courses

Environmental Management Systems Auditing Course

#### Year of Birth

1978

#### Nationality

Dual British and South African

#### Languages

English, Afrikaans

#### Career Profile

Rhys has an oceanographic background with a specific interest in water quality. He has experience in both groundwater and surface water projects in freshwater and marine systems. Prior to working at WSP Rhys ran a water quality laboratory at the University of Cape Town

Rhys has three years consulting experience. His primary project experience includes specialist input into EIA's, compliance and due diligence auditing, compliance monitoring, and contaminated land investigation and remediation.

#### Areas of Expertise

Chemical Oceanography, Environmental Water Quality Investigations (oceanographic, hydrogeological and fluvial systems), Compliance Monitoring, Contaminated Land Investigations, Environmental Due Diligence Audits, Environmental Impact Assessments, Environmental Management Plans

#### Countries Worked

South Africa, Seychelles, Nigeria, Antarctica.



## **MAJOR PROJECT EXPERIENCE**

### **Environmental Investigations**

#### *Cerebos Salt Works Velddrif – Aquaculture Feasibility Study*

Study to assess the feasibility of converting the evaporation ponds at the Cerebos Salt Works into ponds suitable for aquaculture. The scope of work included determining the level of salt and metal contamination in the substrate of the ponds and the leaching potential from the substrate to ascertain if the ponds are suitable for the proposed future use.

#### *Ile Aurore Nouvelle – Baseline Water Quality Study*

Baseline study to establish the water quality in the nearshore region adjacent to Ile Aurore Nouvelle situated on the east coast of Mahe, Seychelles, prior to the expansion of the island through land reclamation and the construction of a luxury golf course and marina development.

#### *Ile Aurore Nouvelle – Marine Ecology Impact Assessment*

Baseline study of the marine ecology adjacent to Ile Aurore Nouvelle situated on the east coast of Mahe, Seychelles, prior to the expansion of the island through land reclamation and the construction of a luxury golf course and marina development.

#### *Baja Sardinia, Langebaan*

Baseline groundwater study of the Baja Sardinia site situated adjacent to the environmentally sensitive Langebaan Lagoon and West Coast National Park. The project involved determining groundwater flow on the site and pollution pathways between the proposed development and the lagoon.

#### *Dassenberg Farm, Noordhoek*

Baseline groundwater investigation of the Dassenberg Farm, situated in Noordhoek adjacent to the Table Mountain National Park. The investigation determined the quantity and quality of groundwater recharge into the Loch Venus wetland and subsequently the likely impacts associated with developing the farm.

#### *George Rex Drive, Knysna*

Baseline groundwater study on a previously impacted site in Knysna. The project determined the level of contamination on the site resulting from passed land use and nearby point sources of pollution, including a waste water treatment works. Recommendations were made on the suitability of the site for a residential development which included groundwater fed, surface water features.

### **Contaminated Land Site Investigations**

#### *Denel Land Systems Western Cape - Philippi Munitions Facility*

Responsible for the Phase II: Site Characterisation Study of the DLS Philippi munitions facility. The Site Characterisation Study included a baseline geochemical survey of the surface soils on the site and surrounding area, characterisation of contaminated areas on the site, a quantitative human health and environmental risk assessment and preliminary remediation plan.

#### *Denel Land Systems Western Cape – Wellington Production Facility*



Investigated the possible contamination of groundwater down gradient of the effluent treatment facility and evaporation ponds used to dispose of effluent generated by production processes on the site.

*Albertinia Wood Treatment Facility, Albertinia*

Performed a preliminary contamination assessment of the wood treatment facility comprising an invasive investigation and human health and environmental risk assessment.

*Investigation of Underground Storage Tanks, SASOL (Pty) Ltd*

Environmental Risk Assessment of underground storage tanks situated on four City of Cape Town properties.

**Environmental Audits**

*ROSE Foundation*

Environmental Compliance Audit of used oil collection and processing facilities regulated by the ROSE Foundation

*NORA Used Oil Collectors*

Environmental Compliance Audit of used oil collectors in the Western Cape

*Denel Naschem Facility, Potchefstroom*

Responsible for undertaking an Environmental Audit and Contamination Assessment of the munitions assembly and testing facility to determine the Environmental Liability associated with past and present operations at the facility.

*Denel Pretoria Metal Pressings, Pretoria West*

Responsible for undertaking an Environmental Audit and Contamination Assessment of the two PMP Facilities namely the metal pressing facility and forge at PMP West and assembly and testing facility at PMP Church Street. The purpose of the audit was to determine the Environmental Liability associated with past and present operations at the facility.

*Denel La Forge Facility, Anderbolt*

Responsible for undertaking an Environmental Audit and Contamination Assessment of metal pressing facility to determine the Environmental Liability associated with past and present operations at the facility.

*Neutron Paints, Atlantis*

Audit team member. Environmental Due Diligence audit to identify potential environmental impacts, non-compliance of legislation, and recommend environmental best practice.

**Environmental Impact Assessments/ Basic Assessments**

*Ile Aurore Nouvelle Environmental Impact Assessment*

Member of the EIA team and involved in the Specialist Studies and drafting of the Environmental Management Plan, for a luxury golf resort development constructed on reclaimed land on Mahe Island, Seychelles.

*Denel Philippi Relocation Environmental Impact Assessment*





Member of the EIA team and involved in the Specialist Studies, Public Participation Process and drafting of the Environmental Management Plan for the relocation and expansion for a munitions facility.

Denel Philippi Decommissioning Basic Assessment

Member of the consulting team who undertook the basic assessment for the decommissioning of the Denel Philippi facility.

### **Environmental Management Plans**

*Ile Aurore Nouvelle, Seychelles*

Developed EMP's for the construction and operational phases of a luxury golf course development in the Seychelles, including a specialised marina management plan.

*Denel Land Systems, Philippi*

Developed the EMP for the relocation and decommissioning of the DLS Philippi munitions facility.

### **Compliance Monitoring**

*Thesen Islands, Knysna*

Quarterly environmental monitoring of ground water, surface water and canal sediments at the luxury marina development, constructed on a remediated and re-developed wood treatment facility adjacent to the environmentally sensitive Knysna lagoon.

*Historic Paarl Golf Club, Paarl, Western Cape.*

Quarterly sampling and geochemical assessment of the groundwater at the Historic Paarl Golf Club constructed on the decommissioned and redeveloped Wateruintjiesvlei Waste Disposal site.

*Denel Land Systems Somerset West, Somerset West*

Annual monitoring of the groundwater at the Denel Land Systems facility in Somerset West.

*Kenilworth Race Course, Kenilworth*

Post construction ground and surface water monitoring to determine whether construction guidelines established to conserve a ground water fed, protected wetland and fynbos habitat were adequate.

### **Permit and License Applications**

*Denel Land Systems Somerset West -Effluent Permit Requirements*

Gap Analysis of effluent permit requirements brought about by the relocation of activities at the DLS Philippi munitions facility to one of two alternate venues. Recommendations on the effluent disposal options at each of the alternate venues were made and the additional permits required identified.

*Denel Land Systems Wellington– Water License Application*

Compiled and submitted the application for a water use license to the Department of Water Affairs and Forestry (DWAF) to discharge industrial effluent into evaporation dams.



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## **EMPLOYMENT HISTORY**

### **WSP Environmental (Pty) Ltd**

*Consultant*

*April 2006 to present*

See descriptions under Major Project Experience above for position and duties.

### **University of Cape Town, South Africa**

*Lecturer - Department of Oceanography*

*September 2003*

Taught an eight lecture module to second year oceanography students titled, "Physical Properties, Water Quality and Marine Pollution". Further responsibilities included teaching and marking the practical component of the course.

*Laboratory Technician*

*August 2001 to January 2004 -*

Responsible for the operation and upkeep of a water analysis laboratory primarily analysing nutrient concentrations in sea water.

### **Alfred Wegener Institute**

*Research Scientist*

*November 2002 to January 2003*

Responsible for the collection, preparation and analysis of water samples for nutrients and dissolved oxygen on the research vessel Polarstern.

### **Smit – Pentow Marine (Pty) Ltd.**

*Consultant*

*August 2003.*

Consultant overseeing the re-floating of the beached fertiliser carrier 'Ikan Tanda' off the Cape coast.

## CURRICULUM VITAE

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Company Name	Arcus GIBB
Nationality	<b>Reuben HEYDENRYCH</b>
Date of Birth	South African
Profession	27.10.1969
Position	Environmental Assessment Practitioner
Specialisation	Senior Environmental Scientist/Associate
	Project management, integrated environmental management including feasibility assessments, environmental impact assessments, environmental management programmes, public facilitation, strategic environmental assessments, environmental management frameworks, environmental auditing, environmental law, environmental policy and guideline development, environmental management systems (ISO 14001)
Start date with ARCUS GIBB	2008 – Permanent full-time staff member

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### Key experience

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An environmental assessment practitioner with 15 years of experience, Reuben Heydenrych specialises in various environmental disciplines.

His key experience includes:

- **Project management** of various medium and large-scale infrastructural and environmental projects
- **Environmental Impact Assessment (EIA)** processes as required by the Environment Conservation Act, 1989 (Act No. 73 of 1989), the National Environmental Management Act, 1998 (Act No. 107 of 1998) and in terms of international requirements as team leader and team member on projects. Projects include exemption, scoping and full EIAs: rezoning, filling stations, water and sewage pipelines, roads (national, provincial and municipal), residential developments, game lodges, telecommunications structures, infrastructure in sensitive environments and industrial processes
- **Environmental advisory services and strategic environmental management** including Strategic Environmental Assessments (SEAs), environmental scans, environmental feasibility studies and Environmental Management Frameworks (EMFs)
- **Environmental management programmes (EMP)** for the construction and operational phases of infrastructure developments
- **Environmental auditing** including due-diligence, ISO 14001, legal compliance and waste audits

## R HEYDENRYCH C V SHEET 2

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### Qualifications

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Bachelor in Landscape. (Landscape Architecture): University of Pretoria, 1991

Master in Philosophy (Environmental Management): University of Cape Town, 1993

Short courses:

- Introduction to Public Participation: Environmental Evaluation Unit, 1993
  - Environmental Management System: Potchefstroom University, 1996
  - Environmental Law: Potchefstroom University, 1996
  - Environmental Auditing: Potchefstroom University, 1996
  - Waste Management: Pretoria Technikon, 1998
  - Certification Body Assessor Workshop: SA National Accreditation System, 12 – 14, Oct 2005
  - Workshop on the implementation of ISO 17021 (Conformity Assessment: Requirements for bodies performing audit and certification management system) – SA National Accreditation System, 24 Jan 2007
  - Intermediate Course in Photography: National College of Photography, 2005
  - Expressive Course in Photography: National College of Photography, 2007
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## R HEYDENRYCH C V SHEET 3

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### Career summary

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June 2008 to  
date

**Arcus GIBB** – Senior Environmental Scientist/Associate

Projects include:

- Finsch Mine Environmental Management Programme (EMPR) updating. The Finsch Mine is located in the Northern Cape Province. The EMPR required updating to consolidate various guidelines and operating procedures. Senior scientist. De Beers, 2008 – 2009
- Matjhabeng (Welkom) Local Municipality Master Plan Development. The environmental portion of the Status Quo Assessment, critical interventions and Master Plan for this local municipality in the Free State were compiled. Senior scientist. Latitude Management Services, 2008 – 2009
- Environmental Impact Assessment process of the Westgate-Tarlton-Kromdraai distribution power line in the Gauteng Province. Senior scientist. Eskom Distribution, 2009.
- Environmental Impact Assessment process of the Tumelo distribution power line near Kagiso in the Gauteng Province. Senior scientist. Eskom Distribution, 2009.
- Basic Assessments for proposed upgrades to the PPC De Hoek cement factory in the Western Cape for Pretoria Portland Cement. Senior scientist. Pretoria Portland Cement. 2009.
- Second party ISO 14001 Environmental Management Systems audits: 3-day 2<sup>nd</sup> party comprehensive Environmental Management System audits of coal-fired power stations in Mpumalanga, a pumped storage scheme in KwaZulu-Natal and gas-turbine plants in the Western Cape. Environmental Auditor. Eskom Generation, 2008 – 2010.
- Basic Assessment processes for nine proposed Co-generation Power Plants for the Promethium-Exxaro Joint Venture. This project includes nine cogeneration power plants to be installed at mines and industrial facilities across South Africa, for the generation of electricity from waste gas. The projects will enable the project initiator to earn Carbon Credits through the Clean Development Mechanism in terms of the Kyoto Protocol under the United Nations Framework Convention on Climate Change. Senior Scientist. Promethium Carbon, 2008-2009.
- Strategic Environmental Assessment (SEA) and Generic Environmental Management Plan (EMP), as well the development of terms of reference for environmental impact assessments for Greater Port Harcourt, Nigeria. Senior environmental scientist. Rivers State Government of Nigeria and Greater Port Harcourt City Development Authority, 2008-2010.
- Strategic Environmental Technical Support Team to the Gauteng Provincial Government for the R20 million Gautrain Project. Technical support will be provided during the construction and operational phases of this flagship transport service project. Senior scientist. Gautrain: 2008 – 2009.
- the Strategic Advisory Team to the Airports Company of South Africa for the proposed Midfield Development at OR Tambo International Airport. Senior scientist. ACSA, 2009.

January 2010

## R HEYDENRYCH C V SHEET 4

- Basic Assessment for the proposed Delta Apron upgrade at O R Tambo International Airport in Gauteng Province. Senior scientist. Airports Company of South Africa, 2008
- Environmental Impact Assessment of the Medupi Landfill Site Project in the Limpopo Province. Senior independent reviewer. Envirolution Consulting, 2009
- Environmental Impact Assessment of the Apollo-Lepini Distribution Power Line in Gauteng Province. Senior independent reviewer. Envirolution Consulting, 2009.
- Environmental Impact Assessment of the Mokopane Integration Project (including transmission lines and substations) in the Limpopo Province. Senior independent reviewer. Savannah Environmental, 2008 – 2009.
- Environmental Basic Assessment for the Watershed-Mmabatho distribution power line in the North West Province. Senior scientist. Eskom Distribution, 2009.
- Environmental Impact Assessment process of the Westgate-Tarlton-Kromdraai distribution power line in the Gauteng Province.. Senior scientist. Eskom Distribution, 2009.
- Environmental Impact Assessment process of the proposed Mulilo coal-fired power station near Musina in Limpopo Province. Senior scientist. Mulilo Power (through Parsons Brinkerhoff), 2009.
- EIA and EMP for the proposed construction, operation and decommissioning of the Pebble Bed Modular Reactor and associated infrastructure in the Western Cape. The project proponent is the Generation Division of Eskom Holdings Limited. The EIA includes a detailed environmental impact assessment. The project includes detailed specialist studies, including social and biophysical, EIA process, public consultation, legal and nuclear technology studies. Senior scientist. Eskom Generation, 2008 – 2009.
- EIA and EMP for the proposed construction, operation and decommissioning of a conventional nuclear power station and associated infrastructure in the Western Cape (Nuclear-1). The project proponent is the Generation Division of Eskom Holdings Limited. The EIA includes the screening and selection of a suitable site for the nuclear plant, as well as a scoping process and detailed environmental impact assessment. The project includes 20 detailed specialist studies, including social and biophysical, EIA process, public consultation, legal and nuclear technology studies. Eskom Generation, 2008 – 2009.
- EIA for the proposed reclamation and treatment of Gaborone (Botswana) wastewater for potable use. This study involved a number of specialist studies and extensive public consultation. Senior scientist. 2008.
- Compilation of an Environmental Management Plan (EMP) for the construction and operational phases of the Perseus-Gamma, and Hydra-Gamma 765kV transmission power lines, extension to the Hydra Substation, turn-ins of the Beta-Hydra 765 kV transmission power line to Perseus and upgrading of the Perseus Substation. Eskom Transmission, 2008.

March 2004 to May 2008 **Strategic Environmental Focus** - Senior Project Manager, Unit Manager and Project Leader

Responsibilities included:

## **R HEYDENRYCH C V SHEET 5**

- Project management for a variety of projects at various scales and at various stages
- Management and co-ordination of unit staff
- Interfacing with government officials
- Unit time, budget and staff management
- Compilation of proposals and tenders
- Participation in strategic decision-making and company management

Aug 2003 to  
Feb 2004

### **Strategic Environmental Focus - Senior Environmental Manager**

Responsibilities included:

- Environmental impact assessment and scoping processes
- Environmental feasibility assessments
- Environmental management plans and auditing
- Environmental policy and guideline development
- Environmental auditing and implementation of environmental management systems
- GIS-based environmental management frameworks and other decision-support systems

Dec 1999 to  
Aug 2003

### **Environomics cc - Senior Consultant**

Responsibilities included:

- Environmental impact assessment
- Environmental management plans and environmental control officer
- Environmental policy and guideline development
- Environmental auditing and implementation of environmental management systems including ISO 14001 systems
- GIS-based environmental management frameworks and other decision-support systems
- Legislation development

May 1998 to  
30 Nov 1999

### **Nissan South Africa - Group Environmental Manager**

Responsibilities included:

- Implementation and maintenance of an ISO 14001 compliant environmental management system (EMS) throughout 20 functional departments
- Coordinating three ISO 14001 certifications, comprising the main assembly plant, truck plant and engine plant
- Duties at Nissan included monthly environmental performance auditing
- Environmental management system auditing
- Development of EMS procedures
- Environmental training
- Review of the entire EMS through advice to top management

Jan 1996 to  
31 Apr 1998

### **Department of Environmental Affairs & Tourism - Landscape Architect**

Responsibilities included:

- Development of government policy for self-regulatory tools of environmental management
- Promotion of self-regulatory tools of environmental management amongst industry and other government departments
- Auditing and development of the environmental management system for the SANAE IV base in Antarctica

## **R HEYDENRYCH C V SHEET 6**

- Development of integrated environmental management guidelines
- Environmental impact assessment of possible tourism to Marion Island

1 July 1993  
31 Dec 1995

**Cave Klapwijk and Associates** - Landscape Architect

Responsibilities included:

- Landscape design of commercial and residential landscapes
- Compilation of environmental impact assessments
- Rehabilitation planning

### **Project experience at previous employers:**

#### **Management of EIAs:**

- Project manager Scoping and EIA process for the installation of a Crude Acrylic Acid (CAA) tank at the Sasol site in Sasolburg: Sasol. 2008
- Project manager. EIA for the proposed Hendrina-Prairie-Marathon 400 kV 185 km transmission line between Hendrina and Nelspruit in Mpumalanga : Sebenzile Vilakazi (Eskom Transmission). May 2007 – June 2008
- Project manager. EIA process in terms of NEMA EIA regulations for the proposed 2 300 ha K'Shani Golf and Nature Reserve near Nelspruit : K'Shani Golf & Nature Reserve. 2006 - 2007
- Project manager. Environmental Impact Assessment for a proposed 115 km, 1.9 m diameter water pipeline between the Vaal Dam and Secunda (Vaal River Eastern Subsystem Augmentation project) for the TCTA, March to July 2005.
- Project manager. Scoping and Environmental Impact Assessment for the proposed Eskom Komati Water Scheme pipeline and power line project, Mpumalanga : Eskom. 2008.
- Project manager. Environmental Impact Assessment for the Menlyn Roads Project upgrading of municipal roads and the N1 highway in the eastern part of Pretoria : City of Tshwane Metropolitan Municipality and SA National Roads Agency. 2005-2006.
- Environmental Impact Assessment for the Eskom Kudu Integration project, a proposed 400 km, 400 kV electricity transmission line from Oranjemund (Namibia) to Vredendal (Western Cape) : Eskom, 2006 – 2007.
- Project manager. Environmental Impact Assessment for the proposed hotel, residential golf estate and game farm development at Viking Bay adjacent to the Vaal Dam : Tribid Investments
- Project manager. Environmental Impact Assessment for the proposed residential golf estate at Huddle Park, Johannesburg : Tiyani Consortium. 2005 – 2008.
- Project manager. Environmental Scoping for the proposed Orlando Dam Intersection, a mixed use redevelopment of the Orlando Power Station Site in Soweto : Joburg Property Company
- Project manager. Scoping and Environmental Impact Assessment for the proposed Millsite Development, Krugersdorp: Rand Leases.



## **R HEYDENRYCH C V SHEET 7**

- Project manager. Scoping and Environmental Impact Assessment for the proposed Comet Extension eight commercial and light industrial development, Boksburg : Urban Dynamics.
- Project manager. Environmental Impact Report for Brick Making Plant at Ispat Iscor site : Clay Fusion Technologies
- Project manager. Environmental scoping for proposed upgrading of the galvanising plant at Ispat Iscor in Vanderbijlpark : Iscor
- Project manager. Environmental scoping for proposed flood control berms in the Apies River Floodplain between Wonderboomport and the Bon Accord Dam. BKS
- Project manager. Environmental scoping for the widening of 14<sup>th</sup> Avenue in Johannesburg : Arup
- Project manager. Environmental scoping for the widening of Addo Road (Road MR 450) in Port Elizabeth : PD Naidoo & Associates
- Environmental manager. Environmental scoping and environmental management plan for the proposed desilting of the Alberton Dam : SRK
- Environmental manager. Environmental scoping for the development of a proposed shopping centre on Holdings 34 & 35, Kempton Park Agricultural Holding : AJP Group
- Environmental manager. Environmental scoping for the installation of proposed electricity supply cables between Pretoria North Substation and the proposed Annlin Ext 19
- Environmental manager. Environmental scoping for the access road to the Innovation Hub in Pretoria : Arup
- Environmental manager. Environmental scoping for a water pipeline from Driefontein Dam to Duvha Power Station, Mpumalanga : Eskom
- Environmental manager. Environmental scoping for a proposed filling station in Dunkeld West, Johannesburg : Seedprop Consolidated Investments
- Environmental manager. Environmental scoping for the proposed upgrading of the Sinter Plant, Iscor Vanderbijlpark : Iscor Flat Steel
- Environmental scoping for the proposed Clover Hill Extensions 1-4 adjacent to the Bronkhorstspruit Dam : Clover Hill Developments (Pty) Ltd
- Environmental assistant. Environmental Impact Assessment of the proposed Midrand Estates development : Subconsultants to Eco Assessments
- Environmental manager. Environmental feasibility/risk assessment for the proposed Statue of Freedom in Port Elizabeth : KPMG Consortium – GAPP Architects
- Environmental manager. Environmental considerations for the proposed lodge development at the Automotive Supplier Park, Rosslyn : PD Naidoo & Associates
- Environmental manager. Site assessments – exemption applications of ±300 cellphone mast sites for the Cell C network : Subconsultants to Africon Engineering

## **R HEYDENRYCH C V SHEET 8**

- Fieldwork, public participation, EMP development. Environmental scoping of proposed roads and bulk water supply system at Madikwe Game Reserve, North West Province : Subconsultants to Eco Assessments. 2002
- Environmental manager. Environmental scoping for the proposed Alberton Waterfront Development : Odyssey Developments
- Environmental manager. Proposed development of a filling station on the corner of Brits Road and Doreen Road, Akasia for Gerneke & Potgieter : Attorneys – Mr Eugene Gerneke
- Environmental manager. Environmental scoping of a water pipeline at Makgabelwane, North West Province : Munayi Malaka Engineers
- Environmental assistant, public participation, EMP development. Environmental scoping for the proposed research base on Marion Island : Department of Environmental Affairs and Tourism (DEAT)
- Environmental manager. Environmental impact assessment of proposed tourism to Marion Island : Department of Environmental Affairs and Tourism (DEAT)
- Environmental assistant. Environmental Impact Assessment of the proposed Letsibogo Dam on the Motloutse River in northeastern Botswana : Cave Klapwijk & Associates
- Environmental control officer. Environmental Management Plan for the construction of a 40 m tall concrete microwave telecommunications tower at the CSIR, Pretoria : Telkom

### **Independent review of Environmental Impact Assessments**

- Reviewer. Pico Diamonds Environmental Management Plan for Alluvial Diamond Prospecting in the Richtersveld National Park, Northern Cape: SA National Parks through Cameron Cross Inc
- Reviewer. Scoping report for the proposed Kliprivier Nature Estate on Portions 4 and 8 of the farm Kliprivier 464 KQ & Portion 10 of the farm Rhenosterfontein 465 KQ, Limpopo Province: Dabchick Consultancy Limited
- Reviewer. Scoping report for the proposed Limpopo Wildlife Estate on Portions of the Farms Modena 13, MS, Parma 40 MS and Pontdrift 12 MS, Limpopo Province : SA National Parks, through Cameron Cross Associates
- Reviewer. Scoping and EIA reports for the proposed Dome Paradise Township on Portions 19 and 37 of the Farm Rietpoort 518 IQ, North West Province: Adv Jaco Venter. October 2007
- Reviewer. Backlog of EIA, scoping and exemption applications in terms of the Environment Conservation Act, 1989 on behalf of the Limpopo Dept of Economic Development Environment and Tourism (MDALA): LEDET. 2007 – 2008.
- Reviewer. Backlog of EIA, scoping and exemption applications in terms of the Environment Conservation Act, 1989 on behalf of the Mpumalanga Dept. of Agriculture and Land Affairs (MDALA): DEAT. 2007-2008.
- Reviewer. Scoping and EIA application for a proposed shopping centre and residential development on the Farm Klipriviersdal 371, Meyerton: Rand Merchant Bank Properties. 2007

## **R HEYDENRYCH C V SHEET 9**

- Reviewer. EIA process for the proposed Mmamabula – Delta 4 x 400 kV transmission lines: Haygon Safaris. May 2007
- Reviewer. Several EIA reports and the environmental management plan for the proposed Variant Alignment of the Gautrain through the Centurion area: Centurion Association for a Reasonable Environment/weCARE. 2006

### **Environmental Decision Support Systems**

- Data gathering, fieldwork and report writing for the following environmental decision-support systems
- Environmental manager. Gauteng Communication Network Strategy (GAUCONS), a decision-support and administration system for the authorisation of telecommunications masts: Gauteng Department of Agriculture Conservation Environment and Land Affairs (GDACEL)
- Environmental manager, report writing, fieldwork - Buffer zone projects : Phase 1 and 2 Buffer Zone projects for GDACEL, which provide guidelines for the authorisation of developments in proximity to activities that cause pollution (including landfill sites, sewage treatment plants, industries and mine dumps)
- Environmental assistant. Data gathering and database population of the National Forest Inventory : Department of Water Affairs and Forestry

### **Environmental Management Frameworks and Strategic Environmental Assessments**

- Data acquisition, ground truthing and compilation of the following GIS-based Environmental Management Frameworks
- Report on Environmental Management Framework for the Alexandra Renewal Project: Gauteng Department of Agriculture Conservation Environment and Land Affairs (GDACEL)
- Report on data gathering and fieldwork - Environmental Management Framework for Centurion Municipality: Subconsultants to Africon Engineering
- Project assistant. Environmental Management Framework for the Loch Vaal region, Gauteng: Gauteng Department of Agriculture Conservation Environment and Land Affairs (GDACEL)
- Strategic Environmental Assessment for the proposed Senqu Sources protected area : Maloti Drakensberg Transfrontier Project. 2006 – 2008.

### **Environmental Management Systems, Policy and Auditing**

- Development and implementation of ISO 14001 certified environmental management systems (EMSs) and in the auditing of these systems
- Technical expert on ISO 14001 auditing for the South African National Accreditation System (SANAS) – witnessing of the conduct of ISO 14001 Certification Body auditors during audits and assessment of certification body management systems and documentation. Assessments completed include:
  - SABS (September 2005, June 2006, May 2007 and March 2008 – 72 hours total);

## **R HEYDENRYCH C V SHEET 10**

- Price Waterhouse Coopers (Sept 2005, May 2006, Nov 2006 and July 2007– 40 hours total)
  - EQCSA (Nov 2005, Dec 2006 and Sep 2007 – 24 hours total)
  - SGS (Dec 2005, Oct 2006 and Sep 2007– 32 hours total)
  - AFAQ EAQA (Feb 2006 – 32 hours total) – in this instance SANAS was contracted to perform the witnessing on behalf of the United Kingdom Accreditation System (UKAS)
  - I-Cert (May 2006; Sep 2007 and Nov 2007– 24 hours total)
  - Standards Association of Zimbabwe (Jul 2006 and Jul 2007 – 28 hours total)
  - KPMG (Aug 2006 – 8 hours)
  - SANCERT (Jan and Aug 2007 – 24 hours total)
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- Auditing of legal compliance for the Emalahleni Local Municipality's Integrated Municipal Environmental Programme (IMEP): Emalahleni Local Municipality. 2007
  - Project manager. Development of 2nd edition Environmental Implementation Plan (in terms of the National Environmental Management Act, 1998): Department of Trade and Industry. 2006
  - Environmental manager. Environmental Management System : Mbombela (Nelspruit) Local Municipality. 2003
  - Environmental manager. Development of an environmental policy: Mbombela Local Municipality. 2003
  - Group environmental manager. Implementation and certification of ISO 14001 compliant Environmental Management Systems: Nissan South Africa. 1998 – 1999
  - Project assistant. Development of an Information Management System Directorate: Forest Regulation of the Department of Water Affairs and Forestry, 1998
  - Environmental manager. Development of an ISO 14001 Environmental Management System for Debtech (De Beers research and development company). 1998
  - Environmental auditor. Environmental Management System of the SANAE IV base in Antarctica for the Department of Environmental Affairs and Tourism (DEAT). 1995
  - Environmental auditor. ISO 14001 certification and surveillance audits of four companies: South African Bureau of Standards (SABS). 1997 - 1998

### **Legislation and Guideline Development**

- Project manager. Abattoir Waste Management Guidelines Document and Standard Environmental Management Plan : Gauteng Department of Agriculture Conservation and Environment
- Development of a presentation for a series of Information Seminars on EIA Regulations in terms of the National Environmental Management Act : National Department of Environmental Affairs and Tourism
- Editor and project manager. Integrated Environmental Management Information Series Documents "Risk Management" and "Socio-economic Assessment" : Department of Environmental Affairs and Tourism

## **R HEYDENRYCH C V SHEET 11**

- Co-author: (together with James Cross). Integrated Environmental Management Information Series Document “Environmental Assessment Requirements of International Agreements” : Department of Environmental Affairs and Tourism
- Assistant. Development of a Discussion Document: “National Strategy for the *Development of Integrated Environmental Management*” : Department of Environmental Affairs and Tourism, Directorate: Environmental Impact Management
- Assistant. Revision of Chapter 5 of the National Environmental Management Act (Act No. 107 of 1998) dealing with environmental impact assessment and integrated environmental management procedures : Department of Environmental Affairs and Tourism
- Assistant and report writing - costing of the promulgation of a series of six National Environmental Management Bills (including the Air Quality Bill, Biodiversity Bill, Protected Areas Bill & NEMA 1<sup>st</sup> & 2<sup>nd</sup> Amendment Bills) : Department of Environmental Affairs and Tourism
- Assistant. Development of a South African Code of Practice: “*Environmental considerations for the planning and management of telecommunications structures*” : South African Bureau of Standards

### **Miscellaneous**

- Project manager. Supplemental field studies and beneficiary analysis related to a proposed rehabilitation and conservation strategy for wetlands in the highlands of Lesotho : Lesotho Dept of Water Affairs. 2007
- Environmental manager. Motivation report for the declaration of the Prince Edward Islands as a World Heritage Site : Department of Environmental Affairs and Tourism
- Rehabilitation of cutting at the house of Mr Naas Grimbeek at Hartebeespoort Dam
- Fieldwork for opencast coal mining rehabilitation: vegetation monitoring and soil compaction monitoring on Amcoal opencast coal mines. November 1991 to January 1992

## Publications

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***Lessons learnt in the implementation of the new EIA regulations.*** Paper presented at Assessing Environmental Impacts Conference. 5 March 2007. The Business Zone

### ***Editor for three Integrated Environmental Management (IEM) Information Series Documents***

- **Cross, J. 2005.** *Environmental Assessment for International Agreements.* Department of Environmental Affairs and Tourism: Pretoria
- **Bennett, L. 2006.** *Risk Management and Assessment.* Department of Environmental Affairs and Tourism: Pretoria
- **Aucamp, I. 2006.** *Socio-economic Impact Assessment.* Department of Environmental Affairs and Tourism: Pretoria

*The role of Geographical Information Systems (GIS) In EIAs under the new regulations* (Co-authored with Marilene Heunis) Paper at IQPC Conference "Successfully conducting Environmental Impact Assessments". 30-31 January 2006

*A National Strategy for Integrated Environmental Management in South Africa - Discussion Document* (Co-authored with Paul Claassen). 1998. Pretoria: Department of Environmental Affairs and Tourism. 57p

Assistant author to Paul Claassen: *SABS 0262-0: Draft Code of Practice - Environmental considerations for the planning and management of telecommunications structures*

*EMS in the Automotive Industry.* Paper at SAATCA Auditors Conference. 24 August 1999

*Using an internationally recognised EMS to open doors to global market opportunities and promote a chain of environmentally conscious business partnership.* Paper at Environmental Management Conference. 3 February 1999. AIC Conferences

*Current environmental policy framework and strategy for Environmental Management Systems in South Africa.* Joint paper with Ingrid Coetzee. South African Quality Institute Convention on Quality and the Environment. November 1997

*Do the right thing - an introduction to environmental auditing.* 1997. *Conserva*, 12 (1): 20-21

*ISO 14001 Environmental Management System Standard.* 1996. *Conserva*. 11(4): 24-25

## R HEYDENRYCH C V SHEET 13

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### Language capability

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	<b>Speaking</b>	<b>Reading</b>	<b>Writing</b>
English	Excellent	Excellent	Excellent
Afrikaans	Excellent	Excellent	Excellent

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**Signature**

**Date**

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## PROPOSED POSITION : PRINCIPAL HERITAGE CONSULTANT

<b>Company:</b>	UCT Archaeology ACO
<b>Name:</b>	Timothy Hart
<b>Nationality:</b>	South African
<b>Profession</b>	Archaeologist and general heritage practitioner
<b>Position</b>	Director
<b>Date of Birth</b>	29 07 60
<b>Specialisation</b>	Archaeological assessments, Heritage Impact Assessments, Heritage Conservation Planning. ASAPA accredited for pre-colonial archaeology, colonial period, rock art, industrial archaeology, coastal archaeology, grave relocation.
<b>Start date with ACO</b>	1987 - present
<b>Experience:</b>	19 years

**Qualifications:**

- Bachelor of Arts in Archaeology and Psychology
- BA Honours in archaeology
- MA in Archaeology
- Professional member (no 50) Association of Southern African Professional Archaeologists (ASAPA)
- Principal Investigator, cultural resources management section (ASAPA)
- Professional member in specialist and generalist categories Association of Heritage Assessment Professionals

**Membership of Professional Institutions:**

- Founder member of Association of Heritage Assessment Professionals
- Founder member and secretary CRM section ASAPA (1995)
- Council member (1995 – 2000) ASAPA
- Built environment and landscape committee member, Heritage Western Cape (provincial compliance authority for heritage)
- Honorary member of 2 historical associations.

Tim Hart has a Masters degree in Archaeology. In professional practise he has been involved in a wide range of heritage related projects ranging from excavation of fossil and stone age sites to the conservation of historic buildings, places and industrial structures. To date he has led and completed **over 400 projects** throughout the country ranging from minor assessments to participating as a specialist in a number of substantial EIA's as well as international research projects. Together with his colleague Dave Halkett he has been involved in heritage policy development, development of the profession, the establishment of 2 professional bodies and development of professional practice standards. Notable projects he has been involved with are the development of a heritage management plan and ongoing annual mitigation for the De Beers Namaqualand Mines Division, heritage management for Namakwa Sands and other west coast mining houses. Locally, Tim Hart was responsible for the discovery of the "Battery Chavonnes" at the V&A Waterfront (now a conserved as a museum), the discovery of a massive paupers burial ground in Green Point (now a National Heritage Site), the fossil deposit which is now the subject of a public display at the West Coast Fossil Park as well as participating in the development of the Robben Island Museum world heritage site (ongoing). His most recent appointment is to assist with the development of a conservation policy for the Houses of Parliament. Tim Hart has teaching experience within a university setting and have given many public lectures on archaeology and general heritage related matters. In the forthcoming years he will be running a NLF funded project (R1.2m) to research the burial grounds of Green Point.

Project leader

### Relevant Project Experience:

- Specialist consultant – Eskom's Cape strengthening programme (transmission line augmentation and substation expansion in the Western Cape)
- Specialist consultant – Eskom's Kudu Integration project (identifying transmission line routes across Namaqualand)
- Specialist consultant – Eskom's Mossel Bay Open Cycle Gas Turbine project
- Specialist consultant – Eskom's Atlantis Open Cycle Gas Turbine project
- Specialist consultant – Eskom's Koeberg Plant proposed training facility
- Contracted by University of Stanford to set up and participate in Duinefontein Archaeological Research project, Koeberg Nuclear Power Station
- Specialist consultant – Department of Water Affairs raising of Clanwilliam Dam project
- Specialist consultant to De Beers Namaqualand Mines (multiple projects since 1995)
- Project assistant – archaeological surveys for Eskom of Schulpfontein, Brazil and Tweepad to identify potential power station sites.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_



## Curriculum Vitae

### TAMARA BRIDGETT ROBINSON

#### Personal Details

Identity Number: 7807250083087  
Residential Address: 8 Chaucer Road, Claremont, 7708  
Telephone Number: 082 446 4040  
E-Mail Address: Tamara.Robinson@uct.ac.za  
Birth: Carletonville 1978 – 07 – 25 (Age: 31)  
Nationality: South African  
Marital Status: Married to Wynand Anton Smythe (2000)  
Children: Kierha Beth Smythe and Damian Dyllan Smythe

#### Education

Westfields Primary School: 1985 – 1991  
    Prefect: 1991  
Carleton Jones High School: 1992 – 1996  
    Prefect: 1996  
University of Port Elizabeth: 1997 – 1999  
    BSc  
    Final Year Subjects: Zoology  
                            Botany  
    Best final year zoology student  
University of Cape Town: 2000 – 2005  
    2000: BSc (Honours) in Marine Biology  
    2001, 2002, 2003, 2004, 2005: PhD  
    Supervisors: Prof. C.L. Griffiths, Prof. G.M. Branch & Dr A Govender  
    Thesis title: Marine invasive species along the South African coast: threats and opportunities.  
Rhodes University: 2003  
    Short course: Environmental Impact Assessment Procedures

#### Professional Experience

##### Lecturing

University of Cape Town  
2<sup>nd</sup> Year Invertebrate Zoology (ZOO 201S)  
    2005  
2<sup>nd</sup> Year Ecology (BIO2004F)  
    2007  
3<sup>rd</sup> Year Marine Ecology (ZOO302F)  
    2006, 2009  
Environmental and Geographical Science MPhil (Marine Ecology)  
    2005, 2006, 2007, 2008, 2009, 2010  
Scientific Computing (MS Word, Excel, Power Point) for Zoology Honours, Applied Marine MSc and Conservation Biology MSc classes

2003 – 2005  
Conservation Biology MSc (Marine Alien Species)  
2008

Organisation for Tropical Studies  
South African Marine Ecology & Sustainable Utilisation of Marine Resources  
Honours level post-graduate students  
2005, 2007

### **Supervising Post Graduate Students**

Ms. J. Basson (Co-supervisor) 2003  
Honours project title: Species associated with the transfer of the alien oyster  
*Crassostrea gigas* between Knysna and Port Elizabeth

Ms. S. Nakanwe (Co-supervisor) 2006  
Honours project title: Diet of the alien crab *Carcinus Maenas* along South  
African shores.

Ms. T. Haupt (Co-supervisor) 2007-2009  
MSc project title: Translocation of marine alien species in South Africa.

### **Research Assistant**

Prof. Alec Brown (University of Cape Town) 2001 & 2002

### **Consulting**

International Maritime Organisation  
2001 – Intertidal marine invasive species survey of Saldanha Bay &  
Langebaan Lagoon (forming part of the IMO Saldanha Bay Port Survey)

Anchor Consulting  
2001 – Sorting & Identification of Foraminifera samples  
2005 – Rocky shore component of the Water Quality Assessment of  
Saldanha Bay

Centre for Marine Studies  
2002 – Sorting and identification of benthic macrofaunal samples  
2003 – Desktop environmental description of the Benguela Upwelling Region

Pisces Environmental Services  
2004 – Sorting and identification of benthic macrofaunal samples

Fishing and Mariculture Development Association of the Northern Cape (FAMDA)  
2003 – 2005  
Experimental harvesting of the alien mussel *Mytilus galloprovincialis* by local  
people of the Northern Cape: Experimental design, data collection, analysis  
and report writing.

Koeberg Nuclear Power Station  
2004-present – Bi-annual marine environmental monitoring programme

SRK Consulting  
2005 – Marine ecology specialist report for the Koeberg Nuclear Power  
Station Site Safety Report

Strategic Environmental Focus (Pty) Ltd  
2006 – Sorting and identification of benthic macrofaunal samples

Chand Environmental Consultants  
2006 – Marine ecology specialist report for the Granger Bay Precinct EIA

Arcus Gibb

2007 – Marine ecology specialist for the Pebble Bed Modular Reactor Demonstration Power Plant EIA

2008 – Assessment of oceanographic impacts for the Pebble Bed Modular Reactor Demonstration Power Plant EIA

South African Biodiversity Institute

2009 – Review of the impacts of oil and gas infrastructure off the coast of South Africa

### **Editing**

SANCOR (South African Network for Coastal & Oceanographic Research)

2002 – 2004

Student Editor of the SANCOR newsletter

Dr J.A. King (Southern Waters Ecological Research & Consulting)

2003 & 2004

Technical editing of Water Research Commission reports

### **Review of articles for Scientific Journals**

South African Journals

African Journal of Marine Science – 2007

International Journals

Marine Biology – 2007

Marine Ecology Progress Series – 2007

### **Scientific Publications**

Robinson, T.B. & C.L. Griffiths 2002 – Invasion of Langebaan Lagoon, South Africa, by *Mytilus galloprovincialis* – effects on natural communities. *African Zoology* 37: 151-158.

Robinson, T.B. & C.L. Griffiths 2004 – Distribution and status of marine invasive species in and bordering the West Coast National Park. *Kudu* 47: 79-87.

Robinson, T.B., Griffiths, C.L., McQuaid, C.D. & M. Ruis 2005 – Marine alien species of South Africa – status and impacts. *African Journal of Marine Science* 27: 297-306.

Robinson, T.B., Griffiths, C.L., Tonin, A., Bloomer, P. & M.P. Hare 2005 – Naturalized populations of *Crassostrea gigas* along the South African coast: distribution, abundance and population structure. *Journal of Shellfish Research* 24: 443-450.

Robinson, T.B., Branch, G.M., Griffiths, C.L. & A. Govender 2007 – Effects of experimental harvesting on recruitment of an alien mussel *Mytilus galloprovincialis*. *Journal of Experimental Marine Biology and Ecology* 345: 1-11.

Robinson, T.B., Branch, G.M., Griffiths, C.L., Govender, A. & P.A.R. Hockey 2007 – Effects of the invasive mussel *Mytilus galloprovincialis* on rocky intertidal community structure in South Africa. *Marine Ecology Progress Series* 340: 163-171.

Robinson, T.B., Branch, G.M., Griffiths, C.L. & A. Govender 2007 – The invasion and subsequent die-off of *Mytilus galloprovincialis* in Langebaan Lagoon, South Africa: effects on natural communities. *Marine Biology* 152: 225-232.

Robinson, T.B., Govender, A., Griffiths, C.L. & G.M. Branch 2007 – Experimental harvesting of *Mytilus galloprovincialis*: can an alien mussel support a small-scale fishery? *Fisheries Research* 88: 33-41.

Robinson, T.B., Branch, G.M., Griffiths, C.L. & A. Govender 2008 – Resilience and elasticity of intertidal communities in response to harvesting of the alien mussel *Mytilus galloprovincialis*. *Journal of Experimental Marine Biology and Ecology* 354: 167-181.

Branch, G.M., Odendaal, F. & T.B. Robinson 2008 - Long-term monitoring of the arrival, expansion and effects of an alien mussel *Mytilus galloprovincialis* relative to wave action. *Marine Ecology Progress Series* 370: 171-183.

Griffiths, C.L., Mead, A & T.B. Robinson 2009 – A brief history of marine bio-invasions in South Africa. *African Zoology*. 44: 241-247.

Griffiths, C.L., Robinson, T.B., Lange, L. & A. Mead In press – Marine biodiversity in South Africa: an evaluation of current states of knowledge. *PLoS Biology*.

Branch, G.M., Odendaal, F. & T.B. Robinson In press – Competition and facilitation between the alien mussel *Mytilus galloprovincialis* and indigenous species: moderation by wave action. *Journal of Experimental Marine Biology and Ecology*.

Haupt, T.M., Griffiths, C.L., Robinson, T.B. & A.F.G. Tonin In press - Oysters as vectors of marine aliens, with notes on four introduced species associated with oyster farming in South Africa. *African Zoology*.

Haupt, T.M., Griffiths, C.L., Robinson, T.B. Tonin, A.F.G. & P.A. De Bruyn In press – History and status of oyster exploitation and culture in South Africa. *Journal of Shellfish Research*

### **Book Chapters**

Griffiths, C.L., Robinson, T.B. & A. Mead (2008) The status and distribution of marine alien species in South Africa. In: Rilov G, Crooks J (eds) *Biological Invasions in Marine Ecosystems: Ecological, Management and Geographic Perspectives*. Springer, Heidelberg. 393-408.

Griffiths, C.L., Robinson, T.B. & A. Mead (In press) The alien marine crustaceans of South Africa. In: *In the wrong place: Alien marine crustaceans – Distribution, biology and impacts*. Springer, Heidelberg

### **Conference Proceedings**

Robinson, T.B. & C.L. Griffiths Southern African Marine Science Symposium, Swakopmund, Namibia, July 2002. Invasion of Langebaan Lagoon, South Africa, by *Mytilus galloprovincialis* – effects on natural communities.

Griffiths C.L. & T.B. Robinson Third International Conference on Marine Bioinvasions, La Jolla, California, March 2003. Status & ecological impacts of marine invasive aliens in South Africa.

Robinson, T.B. & C.L. Griffiths Joint Conference of Southern African Society of Aquatic Sciences and the Zoological Society of Southern Africa, Cape Town, South Africa, June 2003. Status and ecological impacts of marine invasive aliens in South Africa.

Robinson, T.B. & C.L. Griffiths Southern Connections, Cape Town, South Africa, January 2004. Status and ecological impacts of marine invasive aliens in South Africa.

Robinson, T.B. & C.L. Griffiths Southern African Marine Science Symposium, Durban, South Africa, July 2005. Resilience and elasticity of intertidal communities in response to harvesting the mussel *Mytilus galloprovincialis*.

Reaugh, K.E., Harris, J.M., Branch, G.M. & T.B. Robinson Southern African Marine Science Symposium, Durban, South Africa, July 2005. Five years of intertidal mussel settlement around the coast of southern Africa.

Robinson, T.B., Griffiths, C.L. Branch, G.M., & A. Govender Marine Bioinvasions Conference, Wellington, New Zealand, August 2005. Harvesting of the alien mussel *Mytilus galloprovincialis* by impoverished coastal communities in South Africa: linking biological problems to economic answers.

Griffiths C.L. & T.B. Robinson Fourteenth International Conference on Aquatic Alien Species, Key Biscayne, Florida, USA, May 2006. The *Mytilus galloprovincialis* invasion of South Africa – threats and opportunities.

Reaugh, K.E., Harris, J.M., Branch, G.M. & T.B. Robinson Seventh International Temperate Reefs Symposium, Santa Barbara, California, USA, July 2006. Relationships between mussel recruitment and adult stocks in southern Africa.

#### **Technical Reports**

Robinson, T.B. 2005 – Sustainable harvesting levels for the mussel *Mytilus galloprovincialis* in the Northern Cape. Submitted to FAMDA (Fishing and Mariculture Development Agency)



# INFOTOX (Pty) Ltd

Established 1991 2001/000870/07

**Retrieval and scientific interpretation of ecotoxicological information**

P O Box 98092      Waterkloof Heights      0065      SOUTH AFRICA  
Tel: 27(12) 346 4668      Fax: 086 513 5478      Cell: 0824165864

e-mail: Willie@infotox.co.za

VAT REG NO 4780132181

03-02-2010

## CURRICULUM VITAE

### Dr WCA van Niekerk

Since 1995, Dr Van Niekerk has been Managing Director of INFOTOX (Pty) Ltd. He is a Qualified Environmental Professional (QEP), certified by the Institute of Professional Environmental Practice (IPEP) in the USA, and a registered Professional Natural Scientist (Pr Sci Nat, Environmental Science). Dr Van Niekerk has specialised in chemical toxicology and human health risk assessments, but he has experience in many other areas in the disciplines of analytical and environmental sciences, including radionuclide risk assessment. He worked for many years at the Atomic Energy Corporation (now NECSA) and has considerable experience in aspects pertaining to radionuclides and ionising radiation.

Dr Van Niekerk conducted many health-risk based contaminated site investigations, assessment of human exposure to toxic substances and health risks, sampling and chemical analysis of soil, water and other materials for industrial or environmental characterisation, statistical interpretation of analytical data, and the development of quality assurance documentation for scientific studies. Projects included the quantification of health risks associated with exposure to radionuclides. As part-time Professor in Vista University in Pretoria, he lectured for three years on the chemistry and toxicology of hazardous waste.

Recently, Dr Van Niekerk has been appointed in an advisory capacity by the Chemical and Allied Industries Association (CAIA), the Ferro Alloys Producers Association (FAPA) and the South African Iron and Steel Institute (SAISI) to assist with the development of a waste classification system according to the Globally Harmonised System of Classification and Labelling of Chemicals (GHS).

### QUALIFICATIONS

- BSc (Chemistry), Potchefstroom, 1965.
- Hons BSc (Chemistry), Potchefstroom, 1966.
- MSc (Chemistry), Potchefstroom, 1967.
- PhD (Chemistry), UNISA, 1973.
- QEP (Qualified Environmental Professional), IPEP, USA, 1996.

## **Other training programmes:**

- Time Management Training, DIMENCI, 1982.
- Selling: Getting Down to Basics and Selling: Without Seeing, Chris Penman, UK (presented in Johannesburg).
- Performance Appraisal Management, DIMENCI, 1983.
- Introspection, DIMENCI, 1983.
- Recession Survival, Johan Coetzee Consultants, 1983.
- Management of Conflict, AEC, 1985.
- Situation Leadership, Leadership Studies Productions, CA (presented in Pretoria), 1986.
- Selective Analysis of Ideas, Sales Analysis Institute, USA (presented in Pretoria), 1986.
- Principles of Marketing, UNISA, 1989.
- Rational Management, Kepner Tregoe, 1990.
- Strategic Thinking for Strategic Planning, The Pacific Institute Inc, USA (presented in Pretoria), 1991.
- Effective Communication of Health Risks, Air & Waste Management Association, Denver CO, 1993.
- Management of Technology, University of Stellenbosch, 1995.
- Implementation of ISO 14000 in Environmental Management, Air & Waste Management Association, Nashville TE, 1996.

## **CAREER HISTORY**

- Soil and Irrigation Research Institute, 1968 to 1971.
- Atomic Energy Board, 1971 to 1982.
- SMM Instruments, 1982 to 1984.
- Atomic Energy Corporation, 1984 to August 1997.
- INFOTOX, August 1995 onwards (Managing Director).

## **OVERSEAS EXPERIENCE**

- Illinois Institute of Technology, Chicago, 1980: Visiting scientist, participated in Love Canal environmental pollution studies.
- Visited research institutes and other organisations in the USA, England, Belgium, The Netherlands, Germany, Switzerland and Italy. Visits relating specifically to environmental sciences and technologies:
  - United Nations, Geneva, 1991.
  - RIVM, The Netherlands, 1991.
  - Sever Trent Water, England, 1991.
  - Battelle, Columbus, Ohio, 1993.
  - University of Illinois at Chicago, USA, 1993, 1996
  - USA Geological Survey, Virginia, USA, 1993.
  - Triangle Laboratories, North Carolina, USA, 1993.
  - USEPA, Cincinnati, Ohio, USA, 1996, 1997.
  - TERA, Cincinnati, Ohio, 1996, 1997, 2002.

- CDC, Cincinnati, Ohio, 2003.
- NIOSH, Cincinnati Ohio, 2003
- MSHA, Washington DC, 2003.



# Werner Kurt Illenberger

Illenberger & Associates

tel 083 626 1917

[werner@illenberger.biz](mailto:werner@illenberger.biz)

## Personal Profile

I am widely experienced in the coastal environment, I have consulted for 20 years around the world in research and management issues and visited many of the world's coastlines. I have a broad multi-disciplinary knowledge of the coastal environment: coastal sediment dynamics, beaches, dunes and estuaries; coastal mines, mariculture, coastal groundwater. I have run a community coastal monitoring project that combined environmental education with long-term monitoring of coastal change.

## Key skills and interests

- Coastal environmental consultant - beaches, dunes & estuaries
- coastal sediment dynamics, palaeoenvironments
- theoretical sedimentology, particle shape and size
- Coastal evolution since the break-up of Gondwanaland
- Quaternary dating techniques
- global wind field
- alternate energy
- photography, including aerial photography
- Computer skills: MS Word, Excel, PowerPoint, Thumbsplus
- Languages: English, Afrikaans, German, French

## Employment History

1989 - present time	Environmental consultant, self-employed, Illenberger & Associates
1984 – 1995	Coastal environment researcher, University of Port Elizabeth, South Africa

## Education and Training

BSc	University of Port Elizabeth, South Africa, 1976
BSc Honours:	University of Port Elizabeth, South Africa, 1977
MSc:	University of Port Elizabeth, South Africa, 1986
PhD:	University of Port Elizabeth, South Africa, 1991

## Other Achievements

1988: Prestige Travel Award of the Institute for Coastal Research, University of Port Elizabeth.

First and third prizes in Black & White; second prize in colour prints; three honourable mentions in colour slides at "Geomorphology Beauty Contest", Third International Geomorphology Congress.

## Hobbies

Mountaineering, windsurfing, travel, reading, music, photography, electronics

## Publications

Scientific journal articles and book contributions: 28

Editorships: 3

Popular articles: 5

Conference presentations: ~ 50

Workshop & seminar presentations: ~ 25

Excursion guides: ~ 10

Reports ~ 75

More information is available at [www.illenberger.biz](http://www.illenberger.biz)

## Referees

Referees available upon request.

## CURRICULUM VITAE

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Company Name	Arcus GIBB
Nationality	<b>Yusry FRIZLAR</b>
Date of Birth	South African
Profession	19.12.1957
Position	Civil Engineering
Specialisation	Director
	Traffic engineering, transportation planning and public transport projects
Start date with Arcus GIBB	1997 – Permanent full-time staff member

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### Key experience

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A civil engineer with 27 years experience, Yusry Frizlar specialises in the policy formulation, planning and design of transport projects. He is the Business Unit Leader of Traffic and Transportation in the Western Cape, takes responsibility for the Western Cape Region, and is a director of the company.

His key experience include:

- **Project management of transport and roads projects**
  - **Transportation policy and planning**
  - **Traffic engineering**
  - **Public transport planning**
  - **Traffic impact assessments**
- 

### Qualifications

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Bachelor of Science (Civil Engineering) : University of Cape Town, 1981  
National Higher Diploma : Post – School Education, Cape Technikon, 1986  
Bachelor of Engineering (Honours) (Transportation) : Pretoria University, 1992  
Fellowship : Planning Department, Cornell University, New York, Spring 1994  
TRAC Trainer : TRAC USA (Transport Research Activity Centre), Washington, 1994  
Member of South African Black Technical and Allied Careers Organisation  
Professional Construction Project Manager (PrCPM D/654/2005)

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## Y FRIZLAR C V SHEET 2

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### Career summary

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2000 to date **Arcus GIBB** - Transportation Director, Transportation Group (2001)  
- Division Director, Transportation and Traffic (Western Cape, 2000)  
- Arcus GIBB Holding (Pty) Director, 2008

Key projects include:

- Project Manager for the Revitalisation of Cape Town Station for WC2010 (R480m upgrade), and the long-term planning for Cape Town Station
- Technical leader for the transport planning component for the environmental upgrade of Strand Street (Port Elizabeth)
- Project manager for the development of the Integrated Transport Plan (ITP), Operating Licence Strategy (OLS), and Rationalisation Plan (RatPlan) for Alfred Nzo district Municipality, Eastern Cape
- Project manager for the development of the Integrated Transport Plan (ITP), Operating Licence Strategy (OLS), and Rationalisation Plan (RatPlan) for Amathole District Municipality, Eastern Cape
- Project manager of the establishment of Local Transport Forum in Amathole District Municipality, Eastern Cape
- Project manager for the development of the Provincial Land Transport Framework for the Western Cape Province
- Project director for the Transformation of Scheduled Bus Services in Cape Town for Provincial Government, Western Cape
- Project manager for the preliminary detailed design of Neptune Interchange and dualling of N2 in Coega Industrial Development Zone (R150 million). Design completed in a consortium with African Engineering Consortium (AEC)
- Project executive for road rehabilitation projects including Old Strandfontein Road and Cape Town Airport Taxiways rehabilitation
- Project leader for road rehabilitation projects including construction of Spookdraai in Hex River Pass, design of rehabilitation of N1/8 in Beaufort West, and N1/10 Bontebok joint ventures
- Joint project leader with BKS for the Traffic Impact Assessment of Development Framework for Cape Town International Airport (approximately 1 million m<sup>2</sup>)
- Project leader for preliminary design of Strandfontein Road
- Consultant to PAWC Director : Public Transport including Be-Legal Campaign, Grand West public transport initiatives, metered taxi millennium campaign, various aspects of minibus-taxi formalisation process

1997 to 1999 **Arcus Engineering Consultants** – Director for Transportation Planning and Traffic Engineering

Key projects include:

- Joint project leader with FST on Metropolitan Cape Town Long Distance Public Transport Study for CMC : Directorate Traffic and Transport

05/01/09

### Y FRIZLAR C V SHEET 3

- Member of team which developed the Management Guidelines Policy for Public Transport Interchanges for Modalink
- Member of team which developed management plans for Cape Town Station Deck, Wynberg Transport Interchange (West), and Langa Transport Interchange
- Member of team which prepared the Traffic Impact Assessment of Century City additional development rights (0.5 million m<sup>2</sup>) with responsibility for public transport initiatives
- Assisted PAWC Directorate: Public Transport in project co-ordination of District Council passenger transport plans
- Member of SJA team which assisted PAWC Directorate: Public Transport in various public transport matters including minibus-taxi formalisation, bus contracts in Knysna and Winelands District Council, and minibus-taxi training
- Developed Public Transport Plan for Kayamandi, Stellenbosch
- Project coordinator in a consortium which produced the Development Levy Policy for Road Infrastructure for the metropolitan area for CMC : Directorate Traffic and Transport
- Project leader for the conceptual planning of Strandfontein Road
- Project leader for various traffic impact assessments including Mitchells Plain Town Centre Northern Site and Strand Station Development
- Investigated the upgrading of Nolungile Station Transport Interchange
- Project leader for various TSM projects in City of Tygerberg

1984 to 1996 **Peninsula Technikon in Department of Civil Engineering** – Lecturer, Senior Lecturer, Acting Head (1995 - 1996)

- Subjects taught in Civil Engineering Diploma, Civil Engineering Higher Diploma and Master's Diploma in Civil Engineering : Transport include Transportation II and III; Geotechnical Eng. II and III; Geometric Design, Transportation Engineering and others
- Co-ordinator of BTech degree in Transportation at Peninsula Technikon. Lectured Transportation Planning for BTech
- Concurrently part-time consultant, projects include Inner City Transportation Study, and Wetton Lansdowne Corridor Transport Study, 1994 - 1996
- Participant in National Transport policy review. Participant in Land Transport Commission in development of green and white paper for transport. Participated in two workshops called by Land Transport Commission
- Participant in development of Western Cape land transport policies resulting in green and white paper
- Western Cape TRAC Co-ordinator (Transport Research Activity Centre) 1994-1997. TRAC is a maths and science outreach programme, which uses a computer and various tools and engages learners in practical activities

1981 to 1984 **Ninham Shand** – Junior Engineer at consultant, design and supervision of CPA trunk roads

## Y FRIZLAR C V SHEET 4

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### Publication

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Y Frizlar : Transportation education at Technikons. SAICE Transportation Division  
Quaddrennial at Caledon 1996

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### Language capability

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	<b>Speaking</b>	<b>Reading</b>	<b>Writing</b>
English	Excellent	Excellent	Excellent
Afrikaans	Good	Excellent	Good

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**Signature**

**Date**

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