

Curriculum vitae: Mr A VAN DER MERWE

Name : **VAN DER MERWE, ANDRIES**
 Date of Birth : 23 September 1973
 Profession/Specialisation : Environmental engineering and environmental auditing
 Years with Firm : 17
 Nationality : South African
 Years of experience : 17

Key qualifications

Andries is an Environmental Engineer and heads up the environmental team of the Environment & Advisory Services Unit of the Aurecon Cape Town Delivery Centre, which includes a branch in George. He takes final responsibility for all projects and marketing activities undertaken by his team and has been involved in a wide spectrum of infrastructure development projects throughout Africa. He regularly acts as project team leader and provides technical assistance and input on projects undertaken that typically include large-scale Environmental Impact Assessments (EIAs) related to the resource and energy sectors. He has a keen interest in the application of Multicriteria Decision Making (MCDM) Models in EIA, environmental engineering and strategic planning projects and enjoys challenges in this regard. Recent large EIAs include the Phase 2 SEIA for the Rössing Uranium Mine Expansion Project in Namibia and a series of EIAs for the proposed Moatize Mine Expansion and Nacala Rail Corridor through Mozambique and Malawi for Vale in which he acted as the overall project leader, supported by a senior project manager per each of the five EIA packages.

He has been involved in a number of training and capacity building projects in the field of environmental management. Recent examples include the second phase of the Integrated Industrial Pollution Prevention programme in Mozambique that focused on capacity building in the Environmental Ministry in Mozambique, with specific emphasis on hazardous waste, pollution control and related strategies, as well as the environmental management module of the European Union funded infrastructure asset management training programme run by the National Department of Provincial and Local Government in South Africa for officials of various local and district authorities.

He is a trained SABS/ISO 14001 Environmental Management Systems (EMS) auditor and his specific expertise allows him to assume a leading role in the compilation of Environmental Management Systems (EMSs) and Environmental Management Plans (EMPs) for all life-cycle phases of typical infrastructure development projects, as well as the monitoring and auditing of the implementation of EMSs and EMPs on site. Recent projects of this nature include the operational EMP for the Sunderland Ridge Wastewater Treatment Works, the design and construction EMP for the Gautrain project, EMP implementation monitoring on the 60km Polokwane Effluent Transfer Project for Anglo Platinum and the first phase of EMS development completed for Yum! Restaurants International, that represents KFC in South Africa.

Earlier in his career, he has been exposed to construction environments in both full time and part-time site supervision roles and the design office where he was responsible for the engineering designs and contract documentation for a wide spectrum of infrastructure projects and again later in his career with specific focus on construction EMP implementation monitoring and auditing.

Employment record

01/2012 - Date	Aurecon, Environmental Specialist/Technical Director
01/2004 - 12/2011	Aurecon, Environmental Engineer and Auditor/Associate
08/1999 - 12/2004	Aurecon, Environmental Engineer and Auditor
08/1998 - 07/1999	Aurecon, Resident Engineer
01/1996 - 07/1998	Aurecon, Design Engineer

Experience record

Environmental and Social Impact Assessment (ESIA) for three Shoprite supermarkets (Regional, Angola) 02/2012 - Date. *Project Director (Environmental and Social Component).* The project entailed an Environmental and Social Impact Assessment (ESIA) for three proposed new Shoprite Checkers supermarkets and line shops in Angola (Kwanza-sul, Benguela and Luanda), including site screening, scoping study, final Environmental Impact Statement, and a monitoring plan. (Shoprite Angola Imobiliária Lda).

Environmental Management Plans (EMPs) for Coal Bed Methane Prospecting Activities (Tete, Mozambique) 06/2012 - 07/2012. *Project Director.* Rio Tinto Coal Mozambique (RTCM) intended to expand their currently authorised coal prospecting activities in Mozambique to include prospecting for Methane. Aurecon was appointed to urgently compile EMPs to control activities associated with prospecting for Coal Bed Methane for lease areas 935L, 948 and 945L in Tete Province, Mozambique. (Rio Tinto Coal Mozambique).

The Erongo Power Station Environmental Socio-Economic Impact Assessment (ESEIA) (Erongo, Namibia) 09/2011 - 28/2013. *Project Director.* The project entailed a study of a proposed new power station which would increase the electricity generating capacity of the Erongo Region in Namibia. Aurecon was appointed by NamPower to undertake the ESEIA process in terms of the Environmental Management Act No 7 of 2007 and the Environmental Assessment Policy of 1994. This ESEIA aimed to assess the impact of a 150/300/800MW coal-fired power station with associated coal stockyard, an ash disposal facility and transport systems to deliver coal. Involved for 3.75 person-months. (Namibia Power Corporation (NamPower)).

Environmental Impact Assessment (EIA) for the construction of the AfriSam cement factory, quarries and associated infrastructure (Western Cape, South Africa) 02/2011 - Date. *Project Director.* Aurecon was appointed to undertake an Environmental Impact Assessment (EIA) process for a new cement plant, mine and associated infrastructure located on Farm 1139 in the Saldanha Industrial Area. The project entailed mining activities at limestone quarries, including Prospect Hill Quarry, Oranjevelei Quarry and Holvlei Quarry; and a conveyor belt linking the quarries to the cement factory with a registered servitude. (AfriSam South Africa).

Emergency desalination plant, Mossel Bay (Mossel Bay, South Africa) 05/2010 - 12/2012. *Project Leader.* Compilation of a Section 24G application in terms of the National Environmental Management Act for an emergency 15M/d seawater reverse osmosis plant as a result of more than 1:150 year drought situation in the Southern Cape, inclusive of a construction phase Environmental Management Plan. (Mossel Bay Municipality).

Environmental and Social Impact Assessments (ESIAs) for five Shoprite Checkers stores in Angola (Regional, Angola) 08/2010 - 03/2013. *Project Director (Environmental Component).* This project entailed undertaking several Environmental and Social Impact Assessments (ESIAs) for the construction and expansion of shopping centres. Aurecon was appointed to undertake five Environmental and Social Impact Assessments (ESIAs) for the construction of two new shopping centres and the expansion of the three existing shopping centres. (Shoprite Angola Imobiliaria Lda).

Environmental Impact Assessment (EIA) for the Moatize Coal Mine expansion project (Tete, Mozambique) 03/2010 - 04/2011. *Project Leader.* The additional infrastructure required for the Moatize coal mine expansion included a second primary crusher and second coal processing plant, increased raw water supply and storage capacity, an upgraded water treatment plant and power substation, a new coal conveyor system, enlarged storage yard to accommodate two lines of coal, optimised materials handling between the existing operations and proposed expansion, upgraded leachate cut-off drains, upgraded tailings dam effluent filtration system, and solid waste landfill and hazardous waste disposal facilities. The Environmental Impact Assessment coincided with a pre-feasibility study (FEL2 Level) undertaken to determine the infrastructure required to accommodate the expansion of the mine. The aim of the assessment was to seek a decision regarding the project acceptability from the Mozambican environmental authorities (MICOA) through an update of the assessment completed for the first Moatize Mine complex and to describe, include and assess the proposed additional infrastructure. Involved for 1.3 person-months. (Vale).

Application of a Multi-criteria Decision Making (MCDM) model to rank development sites within Etosha National Park (Namibia) 04/2010 - 04/2011. *Environmental Engineer.* Compilation of a Section 24G application in terms of the National Environmental Management Act for an emergency 2M/d seawater reverse osmosis plant as a result of more than 1:150 year drought situation in the Southern Cape, inclusive of a construction phase Environmental Management Plan. Involved for 0.8 person-months. (Millennium Challenge Account Namibia).

Environmental Impact Assessments (EIAs) for the Nacala Rail Corridor (Mozambique and Malawi) 03/2010 - 12/2011. *Project Leader.* A series of four Environmental Impact Assessment packages for the proposed 860km Nacala Rail Corridor for the export of coal from the Vale Moatize Mine involving the construction and rehabilitation of the railway line between the loading terminal at the mine and the offloading terminal at the proposed deepwater port at Nacala-a-Velha, passing through southern Malawi. The project

assessed the following components: the expansion of the existing mine loading terminal to accommodate the additional train traffic, transport of coal in trains (each comprising 4 diesel electric locomotives and 115 wagons with a capacity of 60t), management of train movement in the yards with priority given to loaded trains, signalling and control of movement of trains along the route based on GPS technology to allow for monitoring the movement of each and depots along the route to allow for provision of supplies and exchange of teams. It also included the deepwater port at Nacala-a-Velha with new coal terminal off-loading facilities using rail car tippler dumpers, workshops to house rolling stock and to allow for maintenance of trains following discharge and infrastructure for fuel provision. Construction is proposed to start mid-2011, with export capacity ramping up to 26Mtpa in 2016. The focus of the assessments was to review the relevant scoping reports, EPDA reports and available baseline data and acquiring updated information where necessary to describe and assess the predicted social and environmental impacts of the proposed additional infrastructure. Each package included a common assessment of the strategic impacts related to the project as a whole within the region, to allow for an understanding of each component within the bigger picture. (Vale).

Khanyisa Power Station - Geohydrological Investigation (Mpumalanga, South Africa) 09/2010 - 12/2012. *Project Director (Environmental Management Programme Component).* Aurecon was appointed to perform an Environmental Impact Assessment (EIA) for the proposed Khanyisa Power Station near Witbank in the Mpumalanga Province. The scope of services involved the quantification of the anticipated impacts on the geohydrological environment caused by the construction, operation and decommissioning of a Power Plant and associated ash disposal in the vicinity of Anglo American Thermal Coal (AATC). Involved for 0.5 person-months. (Anglo Coal).

Pre-feasibility study for the Great Lakes Railway (Regional) 03/2010 - 12/2012. *Project Director (Environmental Component).* This project revolved around the Governments of Burundi, the DRC, Rwanda, Uganda and Zambia, who needed to improve port, inland waterway and rail inter-connectivity in the Great Lakes Region (Lake Kivu, Lake Edward, Lake Tanganyika, Lake Victoria and Lake Albert) based on several transportation constraints experienced. Responsible for to investigate the potential environmental impacts. Involved for 0.75 person-months. (Common Market for Eastern and Southern Africa (COMESA)).

Social and environmental management plan for new sulphuric acid storage tank at the Rössing Uranium Mine (Arandis, Namibia) 02/2010 - 06/2010. *Project Leader.* The project comprised the compilation of a social and environmental management plan for the proposed new 15Kt sulphuric acid storage tank located within the mine precinct adjacent to similar tanks to increase acid storage capacity. Involved for 0.1 person-months. (Rössing Uranium/Rio Tinto).

Emergency upgrading of Keurbooms rising main and pumps and later application for authorisation for a further length of rising main rehabilitation (Plettenberg Bay, South Africa) 06/2009 - Date. *Project Leader.* The project consisted of the urgent environmental application for the upgrading of the Keurbooms pump station, abstraction works and an initial length of steel rising raw water main to allow for an increase in river abstraction and, later, the application for an environmental management plan. Subsequently, also appointed as the Environmental Control Officer for the construction phases. (Bitou Municipality).

Decommissioning of the Sonae Novobord Fibreboard factory (George, South Africa) 07/2009 - Date. *Project Leader.* The project consisted of an Environmental Management Plan (EMP) for the decommissioning of the Sonae Novobord factory in George Industria, with a focus on the recovery and handling of salvageable materials and the lawful recovery and safe disposal of hazardous wastes and contaminated soil. Later, responsible for acting as the Environmental Control Officer during the decommissioning phase to oversee the implementation of the EMP. (Sonae Novobord).

Emergency desalination plant, Plettenberg Bay (Plettenberg Bay, South Africa) 12/2009 - Date. *Project Leader.* Compilation of a Section 24G application in terms of the National Environmental Management Act for an emergency 2M³/d seawater reverse osmosis plant as a result of more than 1:150 year drought situation in the Southern Cape, inclusive of a construction phase Environmental Management Plan. (Bitou Municipality).

Health and Safety Executive (HSE) brochure for Rössing Uranium's expansion project (Arandis, Namibia) 09/2009 - 11/2011. *Project Leader.* The project entailed the compilation of a succinct and easily accessible brochure describing Rössing Uranium's health, safety and environmental management system components such as management policies, programmes and procedures already in use at the mine for wider public understanding. (Rössing Uranium/Rio Tinto).

Social and environmental management plan for mineral exploration drilling (Arandis, Namibia) 01/2009 - 01/2011. *Project Leader.* The project entailed the compilation of a social and environmental management plan for exploration drilling activities within the overlap of the sensitive Namib-Naukluft Park and Rössing Uranium Mine license area. Also appointed for a phase 2 exploration drilling social and environmental management plan to address more detailed infill drilling, including rehabilitation plans for drill sites and access routes. Involved for 0.5 person-months. (Rössing Uranium/Rio Tinto).

Develop of an Environmental Management Plan (EMP) for the ash dumps at the Kriel Power Station (Mpumalanga, South Africa) 11/2009 - 04/2013. *Project Director.* This project revolved around the Kriel power station; which was quickly reaching the capacity of their ash dams, one site had been identified adjacent to the most recent ash dam, within their premises, and the project allowed for an extension of the existing ash dams facility. (Eskom).

Unifying and standardising of highway engineering practices (Abu Dhabi, United Arab Emirates) 08/2009 - Date. *Project Leader (Environmental Manual Component).* This project revolved around the highway network of the United Arab Emirates (UAE) and gulf region, which is expanding rapidly year by year to accommodate construction developments. Aurecon was appointed to project manage the development of documents which included guidelines, manuals, specifications and standards for the management, planning, design, construction, maintenance and operation of highway projects. These covered all aspects of roads, highway structures and appurtenances, and associated infrastructure. Involved for 0.5 person-months. (UAE Department of Transport).

Social and environmental screening of potential railway route alternatives (Southern Malawi) 05/2009 - 12/2009. *Project Leader.* The project consisted of the screening of four potential railway alternatives through southern Malawi as part of a wider study to determine the feasibility of establishing an export corridor from Tete in Mozambique, through Malawi, to the port of Nacala-a-Velha in Nampula. The environmental screening coincided with an FEL2 level engineering study evaluating the technical and financial feasibility of the routes. The environmental and social screening was done using a simplified Multi-criteria Decision Making (MCDM) model and comprised a review of background information, authority liaison and meetings, compilation of a list of suitable social and environmental screening criteria and rating methodology for each specified criteria, a detailed legal framework review, fieldwork to confirm sensitivity of the receiving environment, a fatal flaw analysis, Geographic Information System (GIS) mapping of findings, preparation of cost estimates of social and environmental mitigation measures including resettlement (split into capital and operational costs), and presentation of the findings and recommendations in a summary report. Involved for 0.8 person-months. (Vale).

Phase 2: social and environmental impact assessment for Rössing Uranium's expansion project (Namibia) 08/2008 - 06/2012. *Project Leader.* The project comprised a social and environmental impact assessment for the second phase of Rössing Uranium's expansion project, including increased production in the current SJ open pit and the establishment of associated process facilities with additional crushers and ore stockpiles, the establishment of an acid heap leaching facility that would be a first in uranium processing, as well as increased waste rock dump capacity and tailings capacity. Involved for 12.5 person-months. (Rössing Uranium/Rio Tinto).

Environmental and socio-economic impact assessment for a proposed NamPower coal-fired power station at Walvis Bay (Walvis Bay, Namibia) 05/2008 - 08/2009. *Environmental Engineer.* The project consisted of an environmental and socio-economic impact assessment for a proposed NamPower coal-fired power station at Walvis Bay which included a site screening and selection process through the application of a multiple criteria decision-making model, a scoping study, and the development of an Environmental Management Plan (EMP). Involved for 2 person-months. (Namibian Power Corporation).

Application of a Multiple-criteria Decision-Making (MCDM) model to optimise future land use planning at Rössing Uranium (Arandis, Namibia) 04/2008 - 03/2009. *Project Leader.* The project comprised the development and application of an MCDM model to optimise future land use planning focusing on the new waste dump areas, heap leach and ripios sites and mine tailings areas. Involved for 1 person-month. (Rössing Uranium/Rio Tinto).

Environmental Impact Assessment (EIA) for the feasibility update and the development of studies to evaluate the transport of coal from Moatize to Nacala and its shipment (Mozambique) 11/2008 - 06/2009. *Environmental Project Leader.* The project comprised the updating of the 2006 Bankable Feasibility Study (BFS) to 14Mtpa and was done to create a rail capacity simulation and trade-offs model for the ramp-up period. Alternative heavy haul routes had to be investigated on Sections 2 and 3 before it was assumed that the base case route was the best route for the new tonnages. There was also a phased

upgrade of the railway line from 4 to 26Mtpa. Responsible for the high level environmental screening. Involved for 3 person-months. (Vale).

Garden Route environmental management framework (South Africa) 06/2008 - 05/2009. *Environmental Engineer.* Responsible for a supporting role contributing to the hydrology and infrastructure information layers and provision of local liaison support for the development of the Garden Route environmental management framework, focusing on the Kaaimans River to Noetzie study area on the Garden Route in the Southern Cape. Involved for 0.2 person-months. (earthINC/Department of Environmental Affairs and Tourism).

Review of the environmental studies and order of magnitude cost estimate and planning for mine expansion in Moatize and Nacala Rail Corridor from Moatize to Nacala-a-Velha (Mozambique and Malawi) 11/2008 - 06/2009. *Project Leader.* An updated Bankable Feasibility Study was required for the entire Moatize Phase 2 mine expansion to step up production and export through the planned rail link to Nacala through southern Malawi, inclusive of the planned construction of a deepwater port at Nacala-a-Velha in Mozambique. The deliverables included a general social and environmental mitigation cost estimate, a specific social resettlement mitigation cost estimate, generic statements of risk and identification of potential fatal flaws related to the different alternatives, detail on the required specialist studies with associated cost estimates, costs for completion of full Environmental Impact Reports (EIRs) and recommendations for way forward in a summary report. Involved for 3 person-months. (Vale Mozambique).

Social and environmental impact assessment for a bulk sulphur handling facility (Walvis Bay, Namibia) 07/2008 - 12/2009. *Project Leader.* The project entailed the compilation of a social and environmental impact assessment, which included a social and environmental management plan for the proposed bulk sulphur importation, stockpiling and handling facility in the Port of Walvis Bay. Involved for 0.5 person-months. (Rössing Uranium/Rio Tinto).

Paratus emergency generation facility (Walvis Bay, Namibia) 05/2008 - 08/2008. *Environmental Engineer.* The project consisted of the environmental authorisation process in relation to a proposed 50MW heavy fuel oil emergency electricity generation facility located within Walvis Bay. Involved for 0.5 person-months. (Namibian Power Corporation).

Social and environmental management plan for Rössing Uranium Expansion Socio-Economic Impact Assessment (SEIA) Phase 1 (Namibia) 02/2008 - 08/2008. *Environmental Engineer.* The project involved the social and environmental management plan for the first phase of Rössing Uranium's expansion project including an acid plant, ore sorter and SK4 pit. Involved for 1.5 person-months. (Rössing Uranium/Rio Tinto).

Environmental impact assessment for the upgrading of the Knysna Wastewater Treatment Works (WWTW) (Knysna, South Africa) 10/2007 - 05/2008. *Internal Reviewer.* The project was concerned with an environmental impact assessment and environmental management plan for upgrading the existing Knysna WWTW in the sensitive Knysna Lakes area in the Southern Cape. Involved for 0.1 person-months. (Knysna Municipality).

Polokwane effluent transfer project (Polokwane, South Africa) 02/2007 - 12/2007. *Environmental Control Officer.* Responsible for acting as the part-time Environmental Control Officer on this project to transfer treated sewage effluent from the Polokwane Wastewater Treatment Works (WWTW) to the AngloPlatinum mine outside Mokopane, including two pump stations, approximately 60km of pipeline and several reservoirs along the alignment. Involved for 2 person-months. (AngloPlatinum).

Upgrading of Khutala pumpstation (Kriel, South Africa) 03/2007 - 08/2007. *Project Leader.* The project entailed a basic assessment for the construction of a bypass pipeline at the Khutala pump station to ensure increased capacity and reduced operating costs. Involved for 0.45 person-months. (Department of Water Affairs and Forestry).

Environmental screening of infrastructure alternatives, Sishen Iron Ore, Sishen (South Africa) 09/2007 - 12/2007. *Project Leader.* The project consisted of the environmental screening of proposed infrastructure route alternatives as input into the design processes for the relocation of infrastructure required as part of the Sishen expansion project. This was done to increase production at the Sishen opencast iron ore mine. Involved for 0.5 person-months. (Kumba Iron Ore).

Basic assessment for the Vaal River Eastern Sub-system Augmentation Project (VRESAP) access road (Vaal Marina, South Africa) 05/2007 - 09/2007. *Project Leader.* The project consisted of a basic

assessment for the 2.2km access road to the Boschkop pump station of VRESAP through the Vaal Marina and traversing the Gauteng and Mpumalanga Provinces. Involved for 0.4 person-months. (Vaal Pipeline Consultants/Trans Caledon Tunnel Authority).

Automotive supplier park (Rosslyn, South Africa) 02/2007 - 12/2007. *Project Manager and Environmental Control Officer.* Responsible for providing environmental management support to the Supplier Park Development Company in the second phase of the establishment of the Automotive Supplier Park in Rosslyn, north of Pretoria. This entailed fulfilling the role of Environmental Control Officer during the construction phase of new projects within the park in this Gauteng Province Blue IQ initiative. Involved for 1.7 person-months. (Project Management Solutions Africa/Supplier Park Development Company).

Upgrading of the Rietfontein Nature Reserve (Paulshof, South Africa) 06/2007 - 09/2007. *Project Leader.* Responsible for acting as Environmental Control Officer on the construction phase of the upgrading of facilities within the Rietfontein Nature Reserve in Paulshof, northern Johannesburg. The first phase of upgrading focused on the establishment of an environmental education centre within the reserve. Involved for 0.2 person-months. (Johannesburg City Parks).

Overhead 132kV powerlines to Liqhobong and Kao Diamond Mines (Lesotho) 09/2006 - 02/2008. *Project Leader.* The project entailed an environmental impact assessment, social impact assessment and public participation for the 38km of 132kV overhead power lines from the Ha Lejone substation to the new Liqhobong and Kao Diamond Mines in northern Lesotho in difficult and inaccessible mountainous terrain. Involved for 4 person-months. (Liqhobong Mining Development Company and Kao Diamond Mine/Plantech Associates).

Rietfontein weir dredging and landfilling (Trichardt, South Africa) 04/2006 - 12/2007. *Project Leader.* In this project, the Environmental Impact Assessment (EIA) for the dredging and land-filling of contaminated silt from the Rietfontein weir in the Trichardspruit north of the SASOL Syferfontein Mine outside Trichardt included the public participation process and permitting the proposed hazardous waste landfill. Involved for 1.5 person-months. (Department of Water Affairs and Forestry).

Doornkraal Reservoir (Polokwane, South Africa) 11/2006 - 12/2007. *Environmental Control Officer.* Responsible for acting as part-time Environmental Control Officer on the 30MI Doornkraal Reservoir construction, west of Polokwane. Involved for 0.8 person-months. (AngloPlatinum).

Laudium bulk supply upgrade (Laudium, South Africa) 12/2006 - 12/2007. *Project Leader.* The project involved basic assessment for the upgrading of an existing bulk supply line of 1.5km to an internal diameter of 700mm, linking a Rand Water supply to the City of Tshwane reservoir in Laudium. Involved for 0.6 person-months. (City of Tshwane).

Upgrading of the K46 Bridge over the Jukskei River (Dainfern, South Africa) 08/2006 - 09/2007. *Environmental Engineer.* The project comprised an application for exemption from the requirements for environmental authorisation for the proposed upgrading of the K46 route over a total distance of 8km. This included alignment improvements and the construction of new dual carriageway bridges to accommodate the 1:100 year flood where the alignment crosses the Jukskei River at Dainfern, north of Johannesburg. Involved for 0.33 person-months. (Gautrans).

McHardy stream diversion basic assessment (Cullinan, South Africa) 07/2006 - 09/2007. *Project Leader.* The project involved basic assessment in terms of the National Environmental Management Act's Environmental Impact Assessment (EIA) regulations for the diversion of McHardy Stream through the Cullinan Diamond Mine grounds to separate polluted runoff from mining activities and unpolluted natural stormwater flow. Involved for 0.63 person-months. (De Beers Group Cullinan Diamond Mine).

Lesotho Highlands further phases studies (Lesotho) 04/2006 - 01/2007. *Environmental Engineer.* The project consisted of the application of the Ideal Mode Analytical Hierarchy Process Multiple Criteria Decision Making (MCDM) model in the initial technical planning workshop to optimise potential further phases' alternatives in the Lesotho Highlands Water Project, with specific focus on MCDM model setup, configuration and application. Involved for 0.8 person-months. (Lesotho Highlands Water Commission).

Joint Maputo River Basin water resources study (Mozambique, Swaziland and South Africa) 09/2006 - 03/2007. *Environmental Engineer.* The project consisted of the compilation of Environmental Impact Assessment (EIA) best practice guidelines based on a comparative review of EIA triggers and process requirements in the Tripartite Permanent Technical Committee member countries and international best practice. This contributed to an integrated comprehensive study of the water resources of the Maputo River

Basin, including Mozambique, Swaziland and South Africa. Involved for 1 person-month. (Tripartite Permanent Technical Committee / European Union).

BKM mine infrastructure (South Africa) 02/2006 - 03/2006. *Project Leader.* The project entailed environmental technical assistance to the engineering design team involved with the design of mine access and services infrastructure for the BKM iron ore mine. The assistance focused on the review of all available baseline information and mine environmental authorisation applications to establish a list of criteria that would ensure compliance with environmental best practice and authorisation permit conditions applicable to the design of services infrastructure. The proposed mine was an opencast mine with a washing, screening and beneficiation plant, ore stockpiles, a crushing plant, conveyors and a rapid rail loading facility. Involved for 0.2 person-months. (BKM Iron Ore Mine).

Sunderland Ridge Wastewater Treatment Works (WWTW) Environmental Management Plan (EMP) implementation monitoring and operational EMP (Centurion, South Africa) 06/2006 - 12/2006. *Environmental Engineer.* The project comprised the monitoring of construction EMP implementation on site for the upgrading of the Sunderland Ridge WWTW in Centurion to increase operational capacity with 20MI day and reporting on EMP implementation status. This included the preparation of monthly summary reports for submission to the provincial environmental authority. Responsible for completing an operational EMP for the upgraded facility. Involved for 0.81 person-months. (City of Tshwane Metropolitan Municipality).

Technical and project management assistance to the Komati Basin Water Authority (KOBWA) (Swaziland) 06/2006 - 08/2006. *Environmental Engineer.* The project consisted of environmental management assistance to KOBWA, with a specific focus on the compilation of a tender document used in a call for tenders for the second round of ecological and aquatic monitoring, tender evaluation and adjudication. Monitoring requirements based on the treaty between South Africa and Swaziland were used as input into the study to determine the environmental water requirements. Involved for 0.25 person-months. (Komati Basin Water Authority).

Bizana solid waste disposal site (Bizana, South Africa) 10/2005 - 02/2006. *Environmental Engineer.* The project involved the development of proposals to formalise the existing Bizana solid waste dump and the operational and decommissioning Environmental Management Plan (EMP) to guide operations up to the site's final closure. Involved for 0.3 person-months. (Mbizana Local Municipality).

Braamhoek pumped storage access roads (South Africa) 08/2005 - 02/2006. *Project Leader.* The project entailed an Environmental Impact Assessment (EIA) for the access roads to the Braamhoek pumped storage scheme, spanning the KwaZulu-Natal and Free State border, and includes both the upgrading of sections of existing roads and the construction of new sections of road in mountainous areas. Involved for 0.2 person-months. (ESKOM Generation Division).

KwaDukuza solid waste management Section 78 assessment (KwaDukuza, South Africa) 07/2005 - 03/2006. *Environmental Engineer.* The project included a Section 78 assessment in terms of the Municipal Systems Act to assess existing solid waste management processes in KwaDukuza and to evaluate the merits of both internal and external service providers based on the financial modelling of both scenarios. Responsible for providing technical solid waste management input to the assessment. Involved for 0.2 person-months. (PriceWaterHouseCoopers Inc/Greater KwaDukuza Municipality).

Mafikeng Industrial Development Zone (IDZ) (Mafikeng, South Africa) 01/2005 - 01/2006. *Project Leader.* The project involved a due diligence assessment and Environmental Impact Assessment (EIA) for the proposed Mafikeng IDZ that was planned around the existing Mafikeng Airport. The development caters for export and high-tech industries and includes a variety of industrial and technology land uses. Initial development was focused on providing for minerals export, livestock export and quarantine facilities, as well as a cluster of light industrial stands. Involved for 0.5 person-months. (Mafikeng Industrial Development Zone (Pty) Ltd).

Senqu and Senqunyane Bridges (Lesotho) 06/2005 - 02/2006. *Project Leader.* This project consisted of an Environmental Impact Assessment (EIA) for two bridges spanning the Senqu and Senqunyane Rivers in Lesotho as part of the proposed Roma-Semongkong-Sekake Road which would reduce travel time to and from the south of Lesotho and increase accessibility to the remote villages to the north of the Senqu and Senqunyane Rivers. Involved for 0.5 person-months. (Lesotho Ministry of Public Works Roads Branch).

Kokstad solid waste management Section 78 assessment (Kokstad, South Africa) 05/2005 - 03/2006. *Environmental Engineer.* The project concerned a Section 78 assessment in terms of the Municipal Systems Act to assess existing solid waste management processes in Kokstad and to evaluate the merits of both

internal and external service providers based on the financial modelling of both scenarios. Responsible for providing technical solid waste management input to the assessment. Involved for 0.25 person-months. (PriceWaterHouseCoopers Inc/Greater Kokstad Municipality).

Groenpunt Prison Wastewater Treatment Works (WWTW) (Sasolburg, South Africa) 08/2005 - 11/2005. *Environmental Engineer and Project Leader.* The project entailed a scoping assessment and Environmental Management Plan (EMP) for the upgrading of the Groenpunt Prison WWTW on the banks of the Vaal River at Sasolburg. The upgraded works reduced the pollution risk that the existing system posed and mainly treats effluent from the large piggery on site. Involved for 0.25 person-months. (Stewart Scott International/Department of Public Works).

City of Tshwane: city development strategy (Tshwane, South Africa) 07/2005 - 07/2005. *Environmental Engineer.* The project concerned technical and engineering input into the review and updating of the City of Tshwane's city development strategy, with specific inputs focusing on general environmental management strategic issues and solid waste management opportunities and constraints. The strategy aimed to unlock the potential of the north of Tshwane by providing suitable infrastructure to stimulate growth. Involved for 0.2 person-months. (City of Tshwane Metropolitan Municipality).

Integrated industrial pollution prevention, Phase 2, national hazardous waste management strategy (Mozambique) 01/2004 - 03/2006. *Environmental Engineer and Project Leader of Subconsultancy Team.* The project consisted of technical assistance to the Environmental Ministry of Mozambique, in association with Ramboll, as part of the second phase of the integrated industrial pollution prevention programme funded by the Danish International Development Agency (DANIDA). This programme is aimed at hazardous waste management in Mozambique and capacity building within the Ministry regarding issues relating to the identification, handling, disposal, monitoring and regulation of hazardous waste. It also involves monitoring operations at the newly established hazardous waste disposal facility at Mavoco, Beluluane. Involved for 2.5 person-months. (Ministerio para a Coordenacao a Accao Impacto Ambiental (Micoa) / DANIDA).

Coega Industrial Development Zone (IDZ) Zone 1 infrastructure (Port Elizabeth, Eastern Cape, South Africa) 05/2004 - 03/2006. *Environmental Control Officer.* The project included environmental technical assistance to the project implementation team involved with the design and construction supervision of the infrastructure developed for Zone 1 of the Coega IDZ outside Port Elizabeth in the Eastern Cape Province. Responsible for acting as the Environmental Control Officer on site for the duration of construction. Involved for 1.1 person-months. (Coega Development Corporation).

Lagos toll roads feasibility (Nigeria) 08/2004 - 11/2005. *Environmental Engineer.* The project consisted of an Environmental Impact Assessment (EIA) and social impact assessment as part of the feasibility study for the development of approximately 150km of new toll roads through Lagos and along the Lekki Peninsula outside Lagos. Involved for 1 person-month. (Asset and Resource Management Company).

Facim commercial development (Mozambique) 10/2004 - 01/2005. *Project Leader.* The project entailed an environmental opinion and detailed Environmental Management Plan (EMP) for the Facim commercial development which includes an exhibition area, conference facilities, shopping centre and office space in downtown Maputo, and potentially presents the single largest private real estate investment in Mozambique. Involved for 0.5 person-months. (HLM Financial Enterprises CC).

Ibisi sanitation project (uMzimkulu, South Africa) 05/2004 - 06/2005. *Project Leader.* The project consisted of an Environmental Impact Assessment (EIA) and social impact assessment as part of the feasibility study for the development of approximately 150km of new toll roads through Lagos and along the Lekki Peninsula outside Lagos. Involved for 0.2 person-months. (uMzimkulu Local Municipality).

Department of Provincial and Local Government (DPLG)/European Union (EU) capacity building, phase 2 (South Africa) 07/2004 - 02/2005. *Environmental Training Facilitator.* This was a follow-up to the pilot project to establish environmental capacity on local and district authority level for the operation and maintenance of municipal infrastructure services. An environmental management module was presented to officials from various authorities in Mpumalanga and Limpopo Provinces. Involved for 1 person-month. (Department of Provincial and Local Government).

Ekurhuleni Northern Region Environmental Management Framework (EMF) (South Africa) 03/2004 - 01/2005. *Environmental Engineer.* The project included the development of an integrated EMF to facilitate the existing conflict between development, conservation and high potential agricultural land in Ekurhuleni. Involved for 0.8 person-months. (Ekurhuleni Metropolitan and Gauteng Department of Agriculture, Conservation and Environment (GDACE)).

Maluti landfill Environmental Impact Assessment (EIA) (Eastern Cape, South Africa) 05/2004 - 07/2005. *Environmental Engineer and Project Leader.* The project comprised the compilation of an EIA for the development of a new general communal landfill for the town of Maluti in the Eastern Cape Province. Involved for 1 person-month. (Alfred Nzo District Municipality).

North-West Agrivillage project (Mafikeng, South Africa) 09/2004 - 01/2005. *Project Leader.* The project concerned an Environmental Impact Assessment (EIA) for a new rural agricultural project, including an access road outside Mafikeng as part of a poverty relief initiative under the Expanded Public Works (EPW) programme. Involved for 0.2 person-months. (North West Provincial Department of Public Works).

Mehlodong Adventure Trail access roads (Eastern Cape, South Africa) 06/2004 - 12/2004. *Environmental Auditor.* The project entailed monitoring the implementation of the construction Environmental Management Plan (EMP) for the construction of vehicular access roads in mountainous terrain to the chalets of the Mehlodong Adventure Trail near Maluti in the Eastern Cape Province. Involved for 1 person-month. (Alfred Nzo District Municipality).

Vector Logistics Solutions technical assistance (Gauteng, South Africa) 06/2004 - 08/2004. *Environmental Engineer.* The project concerned technical assistance and conflict resolution for external potential activity impacting on the Vector Logistic food distribution centre in Florida, Johannesburg. Involved for 0.2 person-months. (Vector Logistic Solutions).

Gautrain Rapid Rail Link Environmental Management Plan (EMP) (South Africa) 03/2003 - 02/2007. *Environmental Engineer and Project Leader.* The project consisted of a review of the environmental Record of Decision (RoD) for the project, the drafting of a construction EMP framework for the client to use in a bid for the project, and assistance with specialist environmental management aspects throughout the bidding process. Subsequent further EMP development and refinement followed the announcement of Bombela Consortium as the preferred bidder, leading to the development of both design criteria and a construction phase EMP for the project. Involved for 7.2 person-months. (Bombela Consortium).

Limpopo National Park first phase infrastructure (Mozambique) 10/2003 - 03/2006. *Environmental Engineer.* The project involved an Environmental Impact Assessment (EIA) for the first phase infrastructure development for the Limpopo National Park comprising a camp, workshop, administrative complex, staff housing, ranger posts and a new entrance gate. Involved for 2 person-months. (Limpopo National Park/Peace Parks Foundation).

Mbombela State of the Environmental Report (SoER) (Mpumalanga, South Africa) 01/2003 - 03/2004. *Environmental Engineer.* The project comprised an SoER for the Mbombela Local Municipality in Mpumalanga Province in South Africa which entailed the establishment and development of a base for environmental reporting based on the United Nations Driving-Forces-Pressures-State-Impacts-Responses (DPSIR) model. Involved for 1.5 person-months. (Mbombela Local Municipality).

Windhoek Environmental Structure Plan (ESP) and policy (Windhoek, Namibia) 01/2003 - 05/2004. *Environmental Engineer.* The ESP is a Geographic Information System (GIS)-based product that provides essential information for land-use planning for development programmes. It classifies an area into environmental zones for various types of development and is supported by a database of physio-ecological information. The project also involved the drafting of an environmental policy for the city of Windhoek after completion of the ESP. Involved for 1.5 person-months. (City of Windhoek).

Moses Kotane environmental policy (North West Province, South Africa) 10/2003 - 05/2004. *Project Leader.* The project included the development of an environmental policy for the Moses Kotane Local Municipality in the North West Province of South Africa. Involved for 0.2 person-months. (Moses Kotane Local Municipality).

Three bridges in Lesotho: Environmental Impact Assessment (EIA) (Lesotho) 07/2003 - 07/2004. *Environmental Engineer and Project Leader.* Responsible for drafting a project brief document with a construction Environmental Management Plan (EMP) for the construction of bridges across the Qhoali, Sebatapa and Phutiatsana Rivers in Lesotho. Involved for 1 person-month. (Ministry of Public Works: Roads Branch).

Freedom Park Legacy Project Environmental Impact Assessment (EIA) (Lesotho) 08/2003 - 08/2004. *Environmental Engineer and Auditor.* The project entailed an EIA for the first phase of the development of the Freedom Park Legacy Project on Salvokop in Pretoria, Gauteng. The project included a detailed visual

assessment and construction Environmental Management Plan (EMP), with EMP implementation monitoring on site during construction. Involved for 0.5 person-months. (Freedom Park Trust).

Limpopo Province State of the Environmental Report (SoER) (Limpopo Province, South Africa) 08/2003 - 01/2004. *Environmental Engineer.* The project entailed the establishment and development of a base for environmental reporting based on the United Nations Driving Forces-Pressures-State-Impacts-Responses (DPSIR) model for the Limpopo Province in South Africa. Involved for 1 person-month. (Limpopo Department of Agriculture, Land and Environmental Affairs).

Water Services Development Plan (WSDP) for Tshwane (Gauteng, South Africa) 04/2003 - 12/2003. *Environmental Engineer and Project Leader.* Responsible for drafting the environmental policy and strategic environmental management plan for the City of Tshwane Division: Water and Sanitation, as well as completing the environmental chapter for the WSDP. Involved for 2 person-months. (City of Tshwane Metropolitan Municipality).

New Lesotho parliament building and staff housing (Lesotho) 03/2003 - 10/2003. *Project Leader.* The project entailed an Environmental Impact Statement (EIS) for the proposed new Lesotho parliament and staff housing complex in Maseru. This included a social impact assessment and specialist vegetation study, as well as an Environmental Management Plan (EMP) with mitigatory measures for potential impacts. Involved for 0.5 person-months. (Ministry of Public Works: Building Design Services).

Rehabilitation Environmental Management Plan (EMP) for Road TR1/11 (Namibia) 11/2003 - 12/2003. *Environmental Engineer and Project Leader.* Responsible for drafting an EMP for the construction and rehabilitation phases of Road TR1/11 from Ondangwa to Oshikango in Namibia. Involved for 0.5 person-months. (Roads Authority of Namibia).

Environmental management system for Yum! Restaurants International (South Africa) 07/2003 - 10/2003. *Environmental Auditor and Project Leader.* The project consisted of the first phase of Environmental Management System (EMS) development for Yum! Restaurants International which represents KFC in South Africa. This involved gap analysis, a legal review, and a review of existing operational policies and procedures with recommendations for further EMS development. Involved for 0.5 person-months. (Yum! Restaurants International).

Master plan for the development of Mussulo Peninsula (Luanda, Angola) 01/2002 - 12/2003. *Environmental Engineer.* The project entailed a master plan for the development of the Mussulo Peninsula, incorporating an Environmental Management Framework (EMF) to focus development on the least sensitive areas, as well as proposals for applicable design standards and norms based on the carrying capacity of the Peninsula to ensure sustainable development. Involved for 3 person-months. (Ministério dos Transportes de Angola).

Spatial representation of industrial areas in Gauteng Province and recommendations on Buffer Zones, Phase 2 (Gauteng, South Africa) 12/2002 - 02/2003. *Environmental Engineer.* Phase 2 of this project consisted of the refining and spatial representation of different categories of industrial land use in Gauteng Province in a Geographic Information System (GIS)-based decision support tool with recommendations on buffer zones for each. Involved for 1 person-month. (Gauteng Department of Agriculture, Conservation, Environment and Land Affairs).

Nestlé Isando Environmental Impact Assessment (EIA) (South Africa) 11/2002 - 12/2003. *Environmental Engineer and Project Leader.* The project involved an EIA for the new dry pet food plant for Nestlé Purina Petcare in Isando and included specialist air pollution dispersion modelling and noise assessment. The aim of the study was to establish status quo conditions on site prior to operation, to predict impacts and to propose suitable mitigation measures where applicable. Involved for 0.5 person-months. (Nestlé Purina Petcare - Friskies).

Environmental Impact Assessment (EIA) and review of engineering design of the Mavoco hazardous waste disposal facility (Beluluane, Mozambique) 01/2002 - 02/2003. *Environmental Engineer.* Responsible for an EIA, a Social Impact Assessment (SIA) and Environmental Management Plans (EMPs) for the construction, operation and rehabilitation phases. Also responsible for reviewing the engineering design of the Mavoco hazardous waste landfill site and access road near Mozal. Involved for 2 person-months. (Ministério para a Coordenação da Acção Ambiental (Micoa)).

Combolcha to Gundewein major link road Environmental Impact Assessment (EIA) (Ethiopia) 11/2002 - 12/2003. *Environmental Engineer.* The project comprised an EIA with a social impact assessment for the

proposed major link road from Combolcha to Gundewein in Ethiopia. Involved for 1 person-month. (Ethiopian Roads Authority).

Environmental Management Plan (EMP) for the Kruger Mpumalanga International Airport (KMIA) (Primkop, White River, South Africa) 07/2002 - 12/2002. *Environmental Auditor.* Responsible for the EMP for the construction phase of the new KMIA, as well as implementation monitoring and auditing during construction. Involved for 3 person-months. (Primkop Airport Management).

Environmental Impact Assessment (EIA) for the telemetry masts for Kanyamazane Water Treatment Works (WTW) and reticulation system (Kanyamazane Mbombela, South Africa) 03/2002 - 08/2002. *Environmental Engineer and Project Leader.* Responsible for EIAs for four telemetry masts of the treatment and reticulation system of the southern Nsikazi regional water scheme. This included construction Environmental Management Plans (EMPs). Involved for 1 person-month. (Mbombela Local Authority).

Survey of tourism potential and Socio-economic Impact Assessment (SIA) in four focus areas, namely: Madikwe, Barberton, Valley of the Olifants and Khayelitsha (South Africa) 01/2002 - 05/2002. *Environmental Engineer.* The project involved a tourism promotion and development potential survey as well as an SIA to review socio-economic conditions, estimate tourism demands and determine the socio-economic impacts of tourism development in each of the focus areas. Involved for 1 person-month. (Japanese International Cooperation Agency (JICA)).

Technical information document on the environmental legislation impacting on engineering work (South Africa) 03/2002 - 07/2002. *Environmental Engineer.* Responsible for drafting a technical information document with a summary of the requirements for Environmental Impact Assessments (EIAs) in terms of South African legislation, with particular reference to engineering work. Involved for 1 person-month. (Aurecon).

Spatial representation of industrial areas in Gauteng and recommendations on buffer zones (Gauteng, South Africa) 01/2002 - 03/2002. *Environmental Engineer.* The project comprised the development of a Geographic Information System (GIS)-based decision support tool to ensure that housing projects in Gauteng are not allowed in areas posing environmental and health risks, by mapping and classifying all industrial areas in the province and establishing worst and best case buffer zones based on legal requirements and expert consultation. Involved for 1 person-month. (Gauteng Department of Agriculture, Conservation, Environment and Land Affairs).

Instream Flow Requirements (IFR) for rivers in the King Sabata Dalindyebo study area (King Sabata, South Africa) 06/2002 - 07/2002. *Environmental Engineer.* The project included the ecological classification of rivers and estimates of IFRs with recommendations on integrated environmental management procedures and ecological management categories for planning purposes. Involved for 1 person-month. (Department of Water Affairs and Forestry (DWAF)).

Operational Environmental Management Plan (EMP) for the Kruger Mpumalanga International Airport (Primkop, White River, South Africa) 04/2002 - 06/2002. *Environmental Auditor.* The project involved an operational EMP covering all operational aspects of the international airport for inclusion in the airport operations manual series. Involved for 1 person-month. (Primkop Airport Management).

Environmental Management Plan (EMP) implementation monitoring on the Mohale feeder roads bridge sites (Mohale, Lesotho) 11/2001 - 02/2003. *Environmental Auditor.* Responsible for monitoring the implementation of the construction EMP and making recommendations on mitigation on the three Mohale feeder roads bridge sites. Involved for 2 person-months. (Lesotho Highlands Development Authority (LHDA)).

Environmental Management Framework (EMF) for Alexandra Township (Alexandra, South Africa) 06/2001 - 10/2001. *Environmental Engineer.* The Alexandra EMF was developed on a Geographic Information System (GIS) platform integrating impact management policy with spatial environmental priorities to seek sustainable development as part of the Presidential Alexandra Renewal Project. The EMF was developed at a scale of 1:5 000 to indicate the required level of detail to fast-track environmental approvals and permitting procedures in areas with low sensitivity, and included a generic environmental management plan for construction in these areas. Involved for 1 person-month. (Gauteng Department of Agriculture, Conservation, Environment and Land Affairs).

Kamiesberg electrification project Environmental Impact Assessment (EIA) (Northern Cape, South Africa) 01/2001 - 03/2001. *Environmental Engineer and Project Leader.* The project included an EIA for the

provision of three-phase electricity to eight rural settlements in the Kamiesberg District in Namaqualand, including the assessment of the alignment of approximately 160km of new overhead electricity supply lines. Involved for 1 person-month. (Kamiesberg Municipal Authority).

Bronberg Reservoir Environmental Management Plan (EMP) (Pretoria, South Africa) 04/2000 - 10/2005. *Environmental Auditor.* The project comprised an EMP for the construction of the new 100ML Bronberg Reservoir, and included site implementation monitoring and auditing. Involved for 1.5 person-months. Involved for 1.5 person-months. (Greater Pretoria Metropolitan Council (GPMC)).

Nelspruit Airport Environmental Risk Assessment (ERA) (Nelspruit, South Africa) 11/2000 - 01/2001. *Environmental Auditor.* Responsible for assessing the environmental performance of activities within the property boundaries of the Nelspruit Airport. Involved for 1 person-month. (ABB).

Centurion Environmental Management Framework (EMF) Phase 2 (Centurion, South Africa) 07/2000 - 06/2001. *Environmental Engineer.* The project involved Centurion's overarching EMF covering the whole of Centurion at a scale of 1:15 000 on a Geographic Information System (GIS) platform integrating impact management policy with spatial environmental priorities to seek sustainable development within Centurion. Involved for 2 person-months. (Centurion Town Council).

Mohale Dam feeder roads Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) (Mohale, Lesotho) 11/2000 - 08/2001. *Environmental Engineer.* The project included an EIA, Social Impact Assessment (SIA), review of the route alignments, and an EMP for the construction phase of the feeder roads around Mohale Dam as part of Phase 1B of the Lesotho Highlands Water Transfer Scheme. Involved for 3 person-months. (Lesotho Highlands Development Authority (LHDA)).

Environmental Risk Assessment (ERA) for the proposed Kruger Mpumalanga International Airport (Primkop, White River, South Africa) 11/2000 - 01/2001. *Environmental Auditor.* The project involved an assessment of the environmental performance of current activities on the proposed site and an assessment of inherent environmental risk with the development of the proposed international airport. Involved for 1 person-month. (Primkop Airport Management).

Nelspruit Airport operational Environmental Management Plan (EMP) (Nelspruit, South Africa) 07/2000 - 09/2000. *Environmental Auditor.* Responsible for an EMP for the operational phase of the airport, based on the outcome of the previously completed risk assessment. Involved for 2 person-months. (ABB).

North West road upgrade Environmental Management Plan (EMP) (North West Province, South Africa) 10/2000 - 11/2000. *Project Leader and Environmental Auditor.* The project involved a generic EMP for an extensive road rehabilitation project, including borrow pits, for the upgrading of 42 roads in the North West Province. Involved for 0.5 person-months. (North West Provincial Department of Public Works).

Tsomo sewage treatment works (Eastern Cape, South Africa) 02/2000 - 03/2000. *Environmental Engineer.* Responsible for an Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) for the sewage treatment works for Tsomo Village. Involved for 1 person-month. (Eastern Cape Department of Public Works).

Qumbo and Gqunu bulk water supply Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) (Eastern Cape Province, South Africa) 02/2000 - 03/2000. *Environmental Engineer.* The project comprised an EIA and EMP to mitigate negative impacts associated with the construction of infrastructure required to supply the villages of Qumbo and Gqunu with piped water. Involved for 1 person-month. (Eastern Cape Department of Public Works).

Environmental Impact Assessment (EIA) and visual assessment for Siemens Cellular Telecommunications masts (South Africa) 09/1999 - 06/2002. *National Project Manager.* The project involved an EIA, visual assessments and public participation processes for the construction of cellular telecommunication masts and, permitting, involved both exemption and scoping with mitigation measures for 1 600 potential cellular masts for the third cellular licence in South Africa in Cape Town, Pretoria, Johannesburg and Durban. Involved for 8 person-months. (Siemens Telecommunications).

Centurion Environmental Impact Assessment (EIA) review panel (Centurion, South Africa) 09/1999 - 12/2001. *Review Consultant.* Responsible for serving as a member of the Centurion Council's environmental review panel, attending bi-weekly meetings and workshops to review all EIA applications after site visits to sensitive sites. Involved for 2 person-months. (Centurion Town Council).

Scoping report and Environmental Management Plan (EMP) for remedial work at Leopard Creek Golf Estate (Malelane, South Africa) 09/1999 - 11/1999. *Environmental Engineer.* The project involved an extended scoping study for the construction of a 140m gabion structure on the southern embankment of the Crocodile River in Mpumalanga. Involved for 1 person-month. (Leopard Creek Golf Estate).

Centurion major roads planning (Centurion, South Africa) 08/1999. *Design Engineer and Project Leader.* Responsible for network planning for Irene as part of the Centurion major roads planning. Involved for 1 person-month. (Centurion Town Council).

Centurion Environmental Management Framework (EMF), Phase 1 (Centurion, South Africa) 08/1999 - 10/1999. *Environmental Engineer.* The project consisted of the first phase of the Centurion EMF and included the planning of one forum of Centurion at a scale of 1:15 000 on a Geographic Information Systems (GIS) platform, integrating an impact management policy with spatial environmental priorities to seek sustainable development within Centurion. Involved for 1 person-month. (Centurion Town Council).

Ethiopian roads Environmental Impact Assessment (EIA) review (Ethiopia) 09/1999 - 11/1999. *Research Member of Environmental Impact Assessment Team.* The project comprised an environmental and social impact assessment of the proposed construction and upgrading of 2 200km of major routes, including a construction Environmental Management Plan (EMP) and detailed mitigation plans. Involved for 1 person-month. (Ethiopian Roads Authority).

Access road and parking area for Technikon North West (Ga-Rankuwa, South Africa) 08/1998 - 09/1999. *Resident Engineer.* Responsible for construction supervision on the construction of an access road and parking area for Technikon North West. Involved for 3 person-months. (Technikon North West).

Rehabilitation of 14.2km of P158-1 (Ben Schoeman Highway) (Pretoria and Centurion, South Africa) 08/1998 - 08/1999. *Assistant Resident Engineer.* Responsible for full-time site supervision on the R40 million rehabilitation of approximately 14.2km of Road P158-1 between Potgieter Street and the Brakfontein Interchange. Involved for 11 person-months. (Gautrans).

Upgrading of streets and stormwater in Mbabane (Mbabane, Swaziland) 02/1998 - 08/1998. *Design Engineer and Project Leader.* Responsible for the design and documentation for the upgrading of streets and stormwater. Involved for 4 person-months. (Mbabane Local Authority).

Kumasi, Tamale and Secondi landfill sites (Kumasi, Tamale, and Secondi Ghana) 06/1998 - 07/1998. *Design Engineer and Project Leader.* Responsible for the design, modelling and volume calculations for the Kumasi, Tamale and Secondi landfill sites. Involved for 1 person-month. (Ghana Department of Local Government).

Samrand Avenue (Centurion, South Africa) 10/1997 - 03/1998. *Design Engineer.* Responsible for the design of Samrand Avenue West of P66-1 in Centurion. Involved for 3 person-months. (Centurion Town Council).

Roads and volume calculations for the Mbabane landfill site (Mbabane, Swaziland) 12/1997 - 02/1998. *Design Engineer.* Responsible for the design of roads and volume calculations for the Mbabane landfill site. Involved for 2 person-months. (Mbabane Local Authority).

Stormwater drainage design for Taung Hospital (Taung, South Africa) 08/1997 - 03/1998. *Design Engineer.* Responsible for the stormwater drainage design for the hospital grounds. Involved for 2 person-months. (Department of Public Works).

Design of New Park Shopping (Kimberley, South Africa) 02/1997 - 10/1997. *Design Engineer and Project Leader.* Responsible for the design of civil works for New Park Shopping Centre including stormwater, access roads, intersections and parking areas. Involved for 3 person-months. (Moolman Brothers).

Stormwater drainage and pavement design at the South African Bank Note Printers (Pretoria, South Africa) 02/1997 - 03/1997. *Design Engineer.* Responsible for stormwater drainage and pavement design for the revised main entrance to the South African Bank Note Printers. Involved for 1 person-month. (South African Bank Note Printers).

Sunnyside Campus of the University of South Africa (UNISA) (Pretoria, South Africa) 02/1997 - 05/1997. *Design Engineer.* Responsible for the civil design of alterations to roads and parking areas for

UNISA's Sunnyside Campus. Involved for 2 person-months. (UNISA).

Stormwater infrastructure design proposal (Johor Bahru, Malaysia) 05/1997 - 11/1997. *Design Engineer.* Responsible for the design proposal for stormwater infrastructure for the Johor Bahru Development. Involved for 2 person-months. (Johor Bahru Development).

Design services for Gabonewe School (Gabonewe, South Africa) 06/1997 - 07/1997. *Design Engineer and Project Leader.* Responsible for the design of access roads and parking areas for Gabonewe School. Involved for 1 person-month. (Department of Education).

Civil design for Latter Day Saints' (LDS) Meeting House (Atteridgeville, South Africa) 07/1997 - 10/1997. *Design Engineer and Project Leader.* Responsible for the civil design for the LDS meeting house. Involved for 1 person-month. (Latter Days Saints' Church).

Design of new sports fields at Technikon North West (Ga-Rankuwa, South Africa) 01/1997 - 02/1997. *Design Engineer and Project Leader.* Responsible for the design and documentation for new sports fields, including drainage culverts. Involved for 2 person-months. (Technikon North West).

Design of stormwater drainage at Technikon North West (Ga-Rankuwa, South Africa) 03/1997 - 05/1997. *Design Engineer.* Responsible for the design of stormwater drainage at Technikon North West residences. Involved for 1 person-month. (Technikon North West).

Tlhabane Township, Phases 1 and 2 (Rustenburg, South Africa) 01/1996 - 04/1998. *Design Engineer.* Responsible for the design of streets and stormwater in Tlhabane Township Phases 1 and 2. Involved for 2 person-months. (Rustenburg Town Council).

Phatsima Township Phases 1 and 2 (Rustenburg, South Africa) 01/1996 - 04/1998. *Design Engineer.* Responsible for the design of an access road to Phatsima Township Phases 1 and 2. Involved for 2 person-months. (Rustenburg Town Council).

Design of access road and parking areas at Technikon North West (Ga-Rankuwa, South Africa) 02/1996 - 05/1997. *Design Engineer and Project Leader.* Responsible for the design of an access road and parking areas at Technikon North West. Involved for 3 person-months. (Technikon North West).

Stormwater and pavement designs at Berea City Complex (Pretoria, South Africa) 01/1996 - 08/1997. *Design Engineer.* Responsible for stormwater drainage and pavement designs at Berea City Complex. Involved for 3 person-months. (EG Chapman Properties).

Stormwater master plan for Tlhabane Township (Rustenburg, South Africa) 07/1996 - 10/1996. *Design Engineer.* Responsible for a stormwater master plan for Tlhabane Township, including stormwater drainage development phasing with expenditure estimates for five years. Involved for 3 person-months. (Rustenburg Town Council).

Earthworks design for Samrand flagship building (Centurion, South Africa) 10/1996 - 12/1996. *Design Engineer.* Responsible for earthworks design and volume calculations for the Samrand flagship building. Involved for 1 person-month. (Samrand).

Residential units at Hans Merensky Golf Course (Phalaborwa, South Africa) 09/1996 - 11/1996. *Design Engineer.* Responsible for the design of streets and stormwater for the proposed development of residential units at Hans Merensky Golf Course. Involved for 1 person-month. (Hans Merensky Golf Club).

Stormwater master plan for Phatsima (Rustenburg, South Africa) 07/1996 - 10/1996. *Design Engineer.* Responsible for a stormwater master plan for Phatsima Township, including stormwater drainage development phasing with expenditure estimates for five years. Involved for 3 person-months. (Rustenburg Town Council).

Education

1995 : BEng (Civil), University of Pretoria, South Africa

Career enhancing courses

- 2013 : SUSOP mechanism for delivering sustainable development projects level 1 training., SUSOP Sustainability Operation
- 2011 : Investment in African Mining International Conference 2011 (Mining Indaba), Cape Town, International Invenconferences
- 2010 : Basic MS Projects Course, Aurecon
- 2009 : Life-Long Learning Solutions CPD DVD Series 2009, South African Association of Consulting Engineers (SAACE)
- 2009 : International Association of Impact Assessment South African National Conference, International Association of Impact Assessment South Africa (IAIASa)
- 2009 : BST Financial Management Course, Aurecon
- 2008 : ProMan Financial Management Course, Ninham Shand, Cape Town
- 2008 : Life-Long Learning Solutions CPD DVD Series 2008, South African Association of Consulting Engineers (SAACE)
- 2008 : WasteCon 2008, Institute of Waste Management of Southern Africa (IWMSA)
- 2007 : Life-Long Learning CPD DVD Series 2007, South African Association of Consulting Engineers (SAACE)
- 2007 : Handling Projects in a Consulting Engineer's Practice, South African Institution of Civil Engineering (SAICE)
- 2006 : Business Finances for Built-Environment Professionals, South African Institution of Civil Engineering (SAICE)
- 2006 : Life-Long Learning Solutions CPD DVD Series, South African Association of Consulting Engineers (SAACE)
- 2006 : Environmental Law Update, North-West University, South Africa
- 2005 : Environmental Law Update, North-West University, South Africa
- 2004 : Internal Assessor/Moderator Course, Africon, South Africa
- 2002 : Role of IT in Management of the RSA Environment, South African Institution of Civil Engineering (SAICE)
- 2002 : Protocol for Risk-Based Evaluation of the Performance of Waste Disposal Sites, South African Institution of Civil Engineering (SAICE)
- 2002 : Business Writing Skills, Pula Madibogo
- 2000 : Microsoft Access, Finlore Education
- 2000 : Environmental Auditing, University of Potchefstroom, South Africa
- 2000 : Environmental Law, University of Potchefstroom, South Africa
- 2000 : Environmental Management Systems (SABS/ISO 14001), University of Potchefstroom, South Africa
- 2000 : Introduction to Environmental Management, University of Potchefstroom, South Africa
- 1999 : Environmental Governance, University of South Africa (UNISA)
- 1998 : Internet and Email, South African Institution of Civil Engineering (SAICE)
- 1997 : Basic Portuguese, Africon/University of South Africa
- 1997 : Microsoft Excel Advanced, Edu-Pro, South Africa
- 1997 : Microsoft Windows 95 Advanced, Edu-Pro, South Africa
- 1997 : Design of Streets and Stormwater, University of Pretoria, South Africa
- 1996 : Communication Skills 1, Africon, South Africa
- 1996 : Microsoft Windows 95, Edu-Pro, South Africa
- 1996 : Model Maker DTM, Model Maker Systems
- 1996 : Internal Project Management, Africon, South Africa
- 1996 : Communication Skills 2, Africon, South Africa

Professional affiliations

Professional Engineer, Engineering Council of South Africa (ECSA)
 Member, South African Institution of Civil Engineering (SAICE)
 Member, Institute of Waste Management of Southern Africa (IWMSA)
 Member, International Association of Impact Assessment (IAIA)

Languages

	Reading	Writing	Speaking
English	Excellent	Excellent	Excellent
Afrikaans	Excellent	Excellent	Excellent

Honours and awards

Merit award for excellence in landscape architecture in the category for ecological planning for the Centurion Environmental Management Framework (EMF) project completed in 2001 received from the Institute of Landscape Architects of South Africa (ILASA) in 2003.

Publications

Schneeweiss, R and van der Merwe, A. 2009. "The Application of Multi-criteria Decision Making in the early stages of Environmental Impact Assessment and Technical Project Development Planning for a large mine expansion project". Paper presented at the International Association of Impact Assessment South African National Conference held in Wilderness, South Africa.

Pillay, M, van der Merwe, A and West, A. 2009. "The Application of the Ideal Mode Analytical Hierarchy Process Multi-criteria Decision Making Model in Strategic Project Planning and Environmental Impact Assessments". Paper presented at the International Association of Impact Assessment South African National Conference held in Wilderness, South Africa.

Referees

Company	Contact Person	Telephone nr.
ABB	Mr Walter Ringelmann	+27 11 236 7221
City of Tshwane Metro	Mr Hannes Scholtz	+27 12 308 8820
Lesotho Highlands Development Authority	Mr Ikarabele Sello	+266 311 280/314 324

Curriculum vitae: Ms L CORBETT

Name : **CORBETT, LOUISE**
 Date of Birth : 31 July 1981
 Profession/Specialisation : Environmental Practitioner
 Years with Firm : 7
 Nationality : South African
 Years experience : 8

Key qualifications

Louise is currently employed as an Associate and Senior Environmental Practitioner in Aurecon's Cape Town office. She has a BSc (Hons) in Environmental and Geographical Science, specialising in Environmental Management, which she obtained from the University of Cape Town (UCT) in 2004. She has seven years' experience in the environmental field and has compiled and managed numerous environmental investigations, including Environmental Impact Assessments (EIAs), Environmental Management Plans (EMPs) and Environmental Management Programmes (EMPs).

Louise has a particular interest in the energy sector, and has undertaken numerous environmental projects in this field. She was the Treasurer of the South African affiliate of the International Association for Impact Assessment (IAIA) for the Western Cape Branch from 2009 to 2011, and remains a Member. She is also a Registered Professional Natural Scientist with the South African Council for Natural Scientific Professions (SACNSP).

Employment record

02/2012 - Date	Aurecon, Associate/Senior Environmental Practitioner
2009 - 01/2012	Aurecon, Senior Environmental Practitioner
2006 - 2009	Aurecon, Environmental Practitioner
2006 - 2007	CCA Environmental (Pty) Ltd, Cape Town, South Africa, Environmental Consultant
2005	Morrison's Plc, London, United Kingdom, Systems Administrator
2004 - 2005	Barclays Bank Plc, London, United Kingdom, Customer Services Advisor

Experience record

Richtersveld Wind Energy Facility (WEF) (Northern Cape Province, South Africa) 07/2012 - 08/2012. *Project Leader.* The project entailed a due diligence of the proposed Wind Energy Facility (WEF) to review compliance with the requirements of the Department of Energy's Independent Power Producer (IPP) process. Responsible for the management and review of the environmental input to the due diligence report. (TRE Tozzi Renewable Energy S.p.A and Guma Group).

Ramp-up of manganese for the Port of Port Elizabeth (Eastern Cape Province, South Africa) 07/2012 - Date. *Environmental Practitioner.* The project entailed FEL2 study consulting services for providing a second berth for manganese bulk vessels in the Port of Port Elizabeth to ramp up export volumes, by extending the existing berth 14. Three main options (with sub-options) were developed as solutions to accommodate the preferred mooring arrangement layout, namely the provision of a mooring buoy; the provision of a mooring dolphin; and mooring to the existing quay. Responsible for review of environmental input required to determine if the project required authorisation in terms of the National Environmental Management Act (NEMA). (Transnet National Ports Authority (TNPA)).

Wind and solar energy facility on Kangnas Farm near Springbok (Northern Cape Province, South Africa) 03/2012 - Date. *Project Leader.* The project entailed an Environmental Impact Assessment (EIA) for a wind and solar energy facility comprising 750MW and 250MW respectively, located approximately 40km from Springbok. Responsible for the management and review of the EIA process and finances. (Mainstream Renewable Power South Africa).

Hydropower station on the Orange River near Kakamas (Northern Cape Province, South Africa) 2011 - 2012. *Project Leader.* The project entailed a Basic Assessment (BA) for a hydropower station comprising 12MW, located on the Orange River near Kakamas. Responsible for the management, finances, undertaking the BA process, specialist coordination and Public Participation Process (PPP). (ArcellorMittal).

Fatal flaw study for four potential Wind Energy Facility (WEF) sites (Northern and Western Cape Provinces, South Africa) 11/2011 - 05/2012. *Project Leader.* The study entailed a fatal flaw analysis of four potential Wind Energy Facility (WEF) sites across the Northern and Western Cape. Responsible for the management and review of the fatal flaw analysis. (Mainstream Renewable Power South Africa).

Three Photovoltaic (PV) energy facilities near De Aar (Northern Cape Province, South Africa) 09/2011 - Date. *Project Leader.* The project entailed two Environmental Impact Assessments (EIAs) and a Basic Assessment (BA) for three Photovoltaic (PV) energy facilities, comprising between 20MW and 150MW, located near De Aar. (Mulilo Renewable Energy (MRE)).

Three Photovoltaic (PV) energy facilities near Copperton (Northern Cape Province, South Africa) 09/2011 - Date. *Project Leader.* The project entailed three Environmental Impact Assessments (EIAs) for three Photovoltaic (PV) energy facilities comprising 75MW to 150MW, located near Copperton. Responsible for the management and review of the EIA process and finances. (Mulilo Renewable Energy (MRE)).

Wind Energy Facility (WEF) on the eastern plateau near De Aar (Northern Cape Province, South Africa) 09/2011 - Date. *Project Leader.* The project entailed an Environmental Impact Assessment (EIA), in terms of the National Environmental Management Act (NEMA), for a new Wind Energy Facility (WEF) comprising 300MW to 520MW. The site is located on the eastern plateau, approximately 20km east of De Aar. Responsible for the management and review of the EIA process and finances. (Mulilo Renewable Energy (MRE)).

Wind Energy Facility (WEF) near Koekenaap (Western Cape Province, South Africa) 07/2011 - Date. *Project Leader.* The project entailed undertaking the Basic Assessment (BA) for the construction of eight proposed wind turbines to generate approximately 19.2MW on the Olifant's River settlement near Koekenaap. Responsible for the management and review of the BA process and finances. (Plan 8).

Reverse Osmosis (RO) plant at Hendrina Power Station near Pullenshope (Mpumalanga Province, South Africa) 02/2011 - 08/2012. *Project Leader/Senior Environmental Practitioner.* The Water Management System (WMS) at Hendrina Power Station was at risk of non-compliance with Eskom's Zero Liquid Effluent Discharge (ZLED) policy due to excess wastewater. In order to reduce the risk of non-compliance, Eskom proposed to construct a Reverse Osmosis (RO) plant to treat concentrated cooling water, which was being disposed of at the Ash Dam as wastewater. The treated water from this plant would be re-used in the power station's processes. The project entailed a Basic Assessment (BA) and Waste Management Licence (WML) for the RO plant. Responsible for the undertaking, management and review of the BA process and finances. (Eskom Holdings).

Rehabilitation of the stormwater system at Zevenwacht Residential Estate (Western Cape Province, South Africa) 2011 - Date. *Project Leader.* The project entailed a Basic Assessment (BA) for the rehabilitation of the stormwater management system on Zevenwacht Residential Estate in order to avoid seasonal flooding of an adjacent residential estate. Responsible for the management and review of the BA process. (City of Cape Town).

Anaerobic biodigester in Elgin (Western Cape Province, South Africa) 12/2010 - Date. *Project Leader.* The project entailed a Basic Assessment (BA) for an anaerobic digester and associated infrastructure for the processing of organic waste to generate heat and electricity on erven 291 and 292 in Grabouw. Responsible for the management and review of the BA process and finances. (Elgin Fruit Juices).

Wind Energy Facility (WEF) near Gouda (Western Cape Province, South Africa) 12/2010 - Date. *Project Leader.* The project entailed an Environmental Impact Assessment (EIA) for a Wind Energy Facility (WEF) comprising 30MW, located near Gouda. Responsible for the undertaking, and the management and review of the EIA process and finances. (iNca Energy).

Upgrading of the Pretoria Portland Cement (PPC) Riebeeck Plant near Riebeeck West (Western Cape Province, South Africa) 11/2010 - 2012. *Technical Advisor.* This project entailed the undertaking of an Environmental Impact Assessment (EIA) for the upgrading of the existing Pretoria Portland Cement (PPC) Riebeeck Plant. Aurecon undertook the environmental authorisation processes required for the proposed upgrade to the existing cement manufacturing plant in Riebeeck West. The upgrade of PPC Riebeeck would align the plant's functioning and operations with the emission requirements now and in the foreseeable future. Responsible for ad hoc review and technical input. (Pretoria Portland Cement (PPC)).

Wind Energy Facility (WEF) in Saldanha (Western Cape Province, South Africa) 10/2010 - 12/2012. *Project Leader.* The project entailed a Basic Assessment (BA) for a Wind Energy Facility, comprising six

turbines, located within the industrial area of Saldanha. Responsible for the management and review of the BA process and finances. (ArcellorMittal).

Wind Energy Facility (WEF) on Struisbult Farm near Copperton (Northern Cape Province, South Africa) 10/2010 - 12/2012. *Project Leader.* The project entailed an Environmental Impact Assessment (EIA) for a Wind Energy Facility comprising 140MW, located near Copperton. Responsible for the undertaking, management and review of the EIA process and finances. (Plan 8).

Solar energy facility on Onder Rietvlei Farm near Aurora (Western Cape Province, South Africa) 07/2010 - 02/2012. *Project Member.* The project entailed a Basic Assessment (BA) for the proposed construction of a 10MW solar energy facility on Portion 3 of Farm 18 near Aurora. Responsible for review of documentation. (Solairedirect Southern Africa).

Environmental Impact Assessment (EIA) for Moatize Coal Mine expansion (Tete Province, South Africa) 03/2010 - 01/2011. *Environmental Impact Assessment (EIA) Technical Team Member.* The Moatize Mine mainly produced coking coal for export (12Mtpa), but it was proposed to expand operations at the mine due to the favourable global market for coal. It was planned that Moatize Mine would increase its production of Run of Mine (ROM) coal from 26 to 52Mtpa, which would result in an additional 12Mtpa of coal production for export. The project entailed an Environmental Impact Assessment (EIA) for the expansion of the existing Moatize Coal Mine in the Tête Province in Mozambique. Responsible for report writing. (Vale Moçambique).

Extension of the ash dam facility at Kriel Power Station (Mpumalanga Province, South Africa) 11/2009 - Date. *Advisory Role.* The project entailed an Environmental Impact Assessment (EIA) and a Waste Management Licence (WML) for the proposed construction of a fourth ash dam facility at the Kriel Power Station. This ash dam would fulfil ash disposal requirements for the remainder of the power station's operational life, during which approximately 111.18 million cubic metres of ash will be produced. Responsible for ad hoc review of various documents and providing technical input as required. (Eskom Holdings).

Reverse Osmosis (RO) plant at Tutuka Power Station (Mpumalanga Province, South Africa) 11/2009 - 07/2012. *Senior Environmental Practitioner.* The brine from the existing Reverse Osmosis (RO) plant was being disposed of on the ash dump through irrigation, which was resulting in leachate from the ash dump. Eskom proposed the construction of an additional RO plant to concentrate the brine from the existing plant in order to limit brine being sent to the ash dump, and to recover water that would be used within the power station. The project entailed a Basic Assessment (BA) and Waste Management Licence (WML) for the RO plant. Responsible for the undertaking, management and review of the BA process and finances. (Eskom Holdings).

Wind monitoring masts in Middelburg (Eastern Cape Province, South Africa) 03/2009 - 07/2010. *Senior Environmental Practitioner.* The project entailed a Basic Assessment (BA) for two wind monitoring masts for the collection of wind data. Responsible for the compilation of the Basic Assessment Report (BAR) and ran the public participation process. (African Infrastructure Investment Managers (AIIM)).

Wind monitoring masts in Cookhouse (Eastern Cape Province, South Africa) 2009. *Senior Environmental Practitioner.* The project entailed a Basic Assessment (BA) for two wind monitoring masts for the collection of wind data. Responsible for the compilation of the Basic Assessment Report (BAR) and running the Public Participation Process (PPP). (African Infrastructure Investment Managers (AIIM)).

Wind monitoring masts in De Aar (Northern Cape Province, South Africa) 2009. *Senior Environmental Practitioner.* The project entailed a Basic Assessment (BA) for two proposed wind monitoring masts for the collection of wind data in De Aar. Responsible for the compilation of the Basic Assessment Report (BAR) and running the Public Participation Process (PPP). (African Infrastructure Investment Managers (AIIM)).

Two coal-fired power stations in the Waterberg area (Limpopo Province, South Africa) 03/2008 - Date. *Project Leader.* The project involved site selection and an Environmental Impact Assessment (EIA) for two proposed coal-fired power stations in Limpopo. The EIA and the framework compilation of an Environmental Management Plan (EMP) were undertaken with the involvement of 17 specialists. Responsible for the site selection process, undertaken by the EIA team; and identifying sites based on technical, environmental and economic constraints. Later in the project cycle took over the management of the project, including compilation of the Environmental Impact Report (EIR) and project finances. (Eskom).

Garden City New Town Development near Kraaifontein (Western Cape Province, South Africa) 01/2008 - 2012. *Senior Environmental Practitioner.* This project included an Environmental Impact Assessment (EIA), in terms of the National Environmental Management Act (NEMA), for a proposed

integrated mixed use housing development covering 782ha, on behalf of Garden Cities and Basil Read. The development comprises various housing types (low income, finance linked and bonded homes), crèches and schools, places of worship, a market area and transport nodes, commercial and light industrial premises, a police station, clinics, sports fields and open spaces/parks, stormwater detention ponds, roads, sewage, water infrastructure and an electrical substation. Responsible for the EIA, all related administrative and management tasks and the compilation of a framework Environmental Management Plan (EMP). (Garden Cities/Basil Read).

Review work (Eastern Cape Province, South Africa) 2008. *Environmental Practitioner.* Appointed by the Eastern Cape's Department of Economic Development and Environmental Affairs (DEDEA) to review and process the backlog of Environmental Impact Assessment (EIA) applications under the Environmental Conservation Act (ECA). Responsible for reviewing and processing a number of applications under the ECA according to sound EIA practices and legal requirements; drafting correspondence to applicants, as well as Records of Decision (RoD) on behalf of DEDEA. (Eastern Cape Department of Economic Development and Environmental Affairs (DEDEA)).

Siting exercise for a Coal-to-Liquids (CTL) facility (South Africa) 2008. *Environmental Practitioner.* The project entailed the identification of sites for an 80-barrel a day Coal-to-Liquids (CTL) facility as well as selection of a preferred site based on a multi-criteria decision analysis tool. Responsible for the compilation of reports. (PetroSA).

Plant extraction facility in the Paarl Industrial Area (Western Cape Province, South Africa) 11/2007 - 07/2009. *Environmental Practitioner.* The project comprised a Basic Assessment (BA) for the construction of a plant extraction facility in Paarl. Responsible for compiling the Basic Assessment Report (BAR) and running the Public Participation Process (PPP). (Cognis).

Subdivision of Farm Palmiet River, Number 319, Elgin (Western Cape Province, South Africa) 02/2007 - 02/2009. *Environmental Practitioner.* The project included a Basic Assessment (BA) for the proposed subdivision of Farm Palmiet River for residential purposes. Responsible for finalising the Basic Assessment Report (BAR) and compiling the comments and response report. (Molteno Brothers).

Deepwater geophysical survey of the South African continental margin (South Africa) 2007. *Environmental Practitioner.* The project comprised a deepwater geophysical survey of the South African continental margin. Responsible for the compilation of the Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP), undertaking the Public Participation Process (PPP), and specialist coordination. (PetroSA).

Upgrade of fuel pipelines at Cape Town International Airport (CTIA) (Western Cape Province, South Africa) 2007. *Environmental Practitioner.* The project comprised an exemption application for the upgrading of fuel pipelines at Cape Town International Airport (CTIA). Responsible for working on compiling the exemption application. (Kantey & Templer for Airports Company of South Africa (ACSA)).

2D seismic survey in the northern block, offshore Namibia (Namibia) 2007. *Environmental Practitioner.* The project comprised a 2D seismic survey in the Northern Block, offshore Namibia. Responsible for compiling the Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP), undertaking the Public Participation Process (PPP), and specialist coordination. (BHP Billiton).

Rocklands Eco Estate, Cape Town (Western Cape Province, South Africa) 07/2006 - 2007. *Environmental Practitioner.* The project involved a Basic Assessment (BA) for the development of a proposed eco estate with approximately 80 houses and public open space. Responsible for being involved in specialist coordination and running the Public Participation Process (PPP). (Rocklands Eco Estate (Pty) Ltd).

Upgrading of facilities at the River Club in Observatory (Western Cape Province, South Africa) 2006 - 2007. *Environmental Practitioner.* The project included a Basic Assessment (BA) for the proposed upgrading of facilities at the River Club, including a conference centre and additional buildings. Responsible for being involved in specialist coordination and running the Public Participation Process (PPP).

Subdivision and rezoning of Erf 3410, Simon's Town (Western Cape Province, South Africa) 2006 - 2007. *Environmental Practitioner.* The project consisted of a Basic Assessment (BA) for the proposed development of 10 luxury houses in Glencairn. Responsible for compiling the Basic Assessment Report (BAR), specialist coordination, and running the Public Participation Process (PPP). (Cape Town Coastal Properties).

Subdivision and rezoning of Erf 23300 in Maitland, Royal Maitland Phase 3 (Western Cape Province, South Africa) 2006 - 2007. *Environmental Practitioner.* The project entailed a Basic Assessment (BA) for the subdivision and rezoning of Erf 23300 in Maitland, for the proposed development of middle-income housing (Royal Maitland Phase 3). Responsible for being involved in compiling the Basic Assessment Report (BAR), specialist coordination and running the Public Participation Process (PPP). (Cape Town Community Housing Company (CTCHC)).

Subdivision and rezoning of Erf 1366, Eerste River (Western Cape Province, South Africa) 2006 - 2007. *Environmental Practitioner.* The project comprised a Basic Assessment (BA) for rezoning Erf 1366, Eerste River, for a residential development of 47 houses. Responsible for compiling the Basic Assessment Report (BAR), specialist coordination, running the Public Participation Process (PPP), and compiling a Construction Environmental Management Plan (CEMP). (Tech-Sure Fin).

Development of the Ibhubesi gas field and associated infrastructure (Western Cape Province, South Africa) 2006 - 2007. *Environmental Practitioner.* This project included an Environmental Impact Assessment (EIA) for the development of Ibhubesi natural gas field and associated infrastructure near Saldanha Bay. Responsible for writing sections of the scoping report and EIA, as well as compiling comments reports and maintaining the Interested and Affected Parties (I&AP) database. (Forest Oil).

Upgrading of National Route 1 (N1) intersections near De Doorns (Western Cape Province, South Africa) 07/2006 - 01/2007. *Environmental Practitioner.* The project consisted of a Basic Assessment (BA) for the proposed upgrading of intersections on National Route 1 (N1) near De Doorns. Responsible for being involved in the compilation of the Basic Assessment Report (BAR) and running the Public Participation Process (PPP). (Argus Gibb for the South African National Roads Agency Limited (SANRAL)).

New regional landfill to service the City of Cape Town (Western Cape Province, South Africa) 2006 - 2007. *Environmental Practitioner.* The project involved an Environmental Impact Assessment (EIA) for a landfill near Atlantis. Responsible for being involved in organising the Public Participation Process, compiling a comments report and managing the Interested and Affected Parties (I&AP) database. (City of Cape Town).

Borrow pits for the upgrading of road sections in the Overberg District (Western Cape Province, South Africa) 2006 - 2007. *Environmental Practitioner.* The project entailed Environmental Management Programmes (EMPs) in terms of the Minerals and Petroleum Resources Development Act (MPRDA) for nine borrow pits, required for the resurfacing of gravel roads in the Overberg District. Responsible for compiling the EMPs, managing two specialists and running the Public Participation Process (PPP). (PD Naidoo & Associates for the Provincial Administration of the Western Cape (PGWC)).

Borrow pits in the Beaufort West and Murraysburg area, Karoo (Western Cape Province, South Africa) 2006 - 2007. *Environmental Practitioner.* The project entailed Environmental Management Programmes (EMPs) in terms of the Minerals and Petroleum Resources Development Act (MPRDA) for 40 strategic borrow pits, required for the resurfacing of gravel roads in and around the Beaufort West and Murraysburg areas (Central Karoo District) in the Karoo. Responsible for compiling the EMPs, managing two specialists and running the Public Participation Process (PPP). (Kwezi V3 for the Provincial Government of the Western Cape (PGWC)).

Rezoning of public open space in Boston, Bellville (Western Cape Province, South Africa) 2006 - 2007. *Environmental Practitioner.* The project entailed a Basic Assessment (BA) for the proposed construction of an off-ramp and parking area in on a portion of Erf 10565 in Boston, Bellville. Responsible for helping to compile the Basic Assessment Report (BAR), and running the Public Participation Process (PPP). (Bright's Hardware).

Resealing of a trunk road and main roads, and the upgrading of a divisional road near Uniondale (Western Cape Province, South Africa) 2006. *Environmental Practitioner.* The project entailed the resealing of Trunk Road 44, Section 1 (TR44/1); Main Roads 401, 404, and 368 (MR401, MR404 and MR368); and the upgrading of Divisional Road 1834 (DR1834) from gravel to sealed road. An associated borrow pit was also developed. Responsible for the compilation of the Environmental Management Plan (EMP) and checklist in terms of the Environmental Conservation Act (ECA); and undertaking the Public Participation Process (PPP) and specialist coordination. (SNA for the Provincial Government of the Western Cape (PGWC)).

Geotechnical survey in the southern and northern blocks offshore Namibia (Namibia) 2006. *Environmental Practitioner.* The project comprised a geotechnical survey of the southern and northern blocks offshore Namibia. Responsible for the compilation of an addendum report for the surveys and managing the Public Participation Process (PPP), specialist coordination, and the compilation of the Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP). (BHP Billiton).

Exemption application for tow surfing in the Table Mountain National Park Marine Protected Area (MPA) (Western Cape Province, South Africa) 2006. *Environmental Practitioner.* The project entailed an exemption application to allow for tow surfing, a prohibited activity, within the Table Mountain National Marine Protected Area (MPA). Responsible for compiling the exemption application, which included research into the environmental impacts of tow surfing, in terms of noise and emissions. (Tow-Surf South Africa).

Construction Environmental Management Plan (CEMP) for Sitari Fields Golf Estate, Firgrove/Macassar (Western Cape Province, South Africa) 2006. *Environmental Practitioner.* The project comprised a golf estate consisting of mixed uses, including a golf course, housing and a clubhouse. Responsible for the compilation of a Construction Environmental Management Plan (CEMP). (Olympian Developing Company).

Abstraction of groundwater to augment Sedgfield's water supply (Western Cape, South Africa) 12/2004 - 02/2009. *Senior Environmental Practitioner.* The project entailed a Basic Assessment (BA) for the abstraction of groundwater in order to augment Sedgfield's water supply. The approach was based on making better use of the available water resources and supplementing the traditional surface water resources with a combination of ground water, desalinated water and the re-use of final effluent. The conjunctive supply approach limits the risk of supply failure from a single source, and ensures sustainable potable water security for Sedgfield. Responsible for the compilation of the Basic Assessment Report (BAR) and for running the Public Participation Process (PPP). (Knysna Local Municipality).

Sedgfield off-channel storage dam (Western Cape Province, South Africa) 12/2004 - 06/2010. *Environmental Practitioner.* The project involved an Environmental Impact Assessment (EIA) for an off-channel dam in Sedgfield. Responsible for compiling the EIA report and for the Public Participation Process (PPP). (Knysna Local Municipality).

Education

2004 : BSc (Hons) Environmental Management, University of Cape Town (UCT), South Africa
 2003 : BSc Environmental and Geographical Science, University of Cape Town (UCT), South Africa

Career enhancing courses

2012 : Conflict Management Course, Centre for Conflict Resolution (CCR), Cape Town, South Africa
 2010 : Project Management Course, Aurecon in-house training, South Africa
 2009 : Certificate in Project Management: Principles and methods for use in business, University of Cape Town (UCT), South Africa
 2008 : Using Natural Resources for Community Development, Gesellschaft Technische Zusammenarbeit (GTZ), South Africa

Professional affiliations

Member, International Association for Impact Assessment South Africa (IAIASa)
 Professional Natural Scientist, South African Council for Natural Scientific Professions (SACNASP)

Languages

	Reading	Writing	Speaking
English	Excellent	Excellent	Excellent
Afrikaans	Good	Good	Good

Publications

Corbett L, and Mangnall M, 2009. "The Value of Pre-EIA Screening Exercises". Presented at the 2009 International Association for Impact Assessment (IAIA) Conference.

Curriculum vitae: Ms K VERSFELD

Name : **VERSFELD, KAREN**
 Date of Birth : 26 March 1980
 Profession/Specialisation : Senior Environmental Scientist
 Years with Firm : 6
 Nationality : South African
 Years experience : 9

Key qualifications

Karen Versfeld is a senior environmental scientist in Aurecon's Cape Town office. She has been active in the field of environmental and water resource management for more than eight years. She experience as a specialist environmental consultant in undertaking environmental processes for both small and medium to large scale development projects. This includes a wide range of projects, from renewable energy projects to pipelines and industrial developments. She has undertaken environmental impact assessments (EIAs) in South Africa and Namibia. Karen also has experience in writing and implementing environmental management plans (EMPs) for the construction and operational phases of developments. She has a particular interest in the energy sector, and has been involved in several wind and solar energy projects.

As a senior environmental scientist and a project leader for EIAs, Karen's responsibilities on projects have included compiling proposals, undertaking project and financial management, managing large and diverse specialist teams, client interaction, integrating specialist findings and compiling reports.

Karen obtained a Master of Science in Water Resource Management from the University of Pretoria in 2004, as well as an Honours Degree from the University of Cape Town (UCT) in 2002. She also holds a Bachelor of Science in Microbiology and Plant Pathology, obtained from the University of KwaZulu-Natal (UKZN). Karen is a candidate member of the South African Council for Natural Scientific Professions (SACNSP).

Employment record

03/2009 - Date	Aurecon, Senior Environmental Scientist
11/2008 - 02/2009	Aurecon, Water Resource Scientist
02/2008 - 11/2008	Arcus GIBB (Pty) Ltd, Environmental Scientist
11/2005 - 01/2008	ILISO Consulting (Pty) Ltd, Environmental Scientist
03/2005 - 10/2005	Hartbeespoort Water Action Group (HWAG), Project Coordinator
09/2004 - 02/2005	CPH2O, Geographic Information System (GIS) Consultant

Management experience

07/2011 - Date	Project Leader
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Experience record

Environmental impact assessment (EIA) for the wind energy facility (WEF) and associated infrastructure on the Wolf Wind Farm (Eastern Cape Province, South Africa) 08/2013 - Date. Project Leader. This project entailed an environmental impact assessment for a 140 MW wind energy facility (WEF) and associated infrastructure on the Wolf Wind Farm near Wolwefontein. Responsible for management and review of the EIA process and finances. (Juwi Renewable Energies (Pty) Ltd).

Due diligence review of an environmental impact assessment (EIA) for a proposed wind energy facility (WEF) and associated infrastructure located 70 km south-west of Nairobi (70 km south west of Nairobi, Kenya) 07/2013 - 09/2013. Project Leader/Senior Reviewer. This project entailed a review of the environmental impact assessment (EIA) process, documentation, and specialist studies to provide comment on the assessments completed and the status of approvals. Responsible for review of the EIA documentation. (Confidential).

Environmental impact assessment (EIA) for the wind energy facility (WEF) and associated infrastructure on Namies Wind Farm (Northern Cape Province, South Africa) 05/2013 - Date. Project Leader. This project entailed an environmental impact assessment for a 40 MW wind energy facility (WEF) and associated infrastructure on the Namies Wind Farm near Aggeneys. Responsible for management and

review of the EIA process and finances. (Juwi Renewable Energies (Pty) Ltd).

Environmental impact assessment (EIA) processes photovoltaic (PV) energy facilities near Prieska and De Aar (Northern Cape Province, South Africa) 03/2013 - Date. *Project Leader.* The project involved an environmental impact assessment (EIA) for the expansion of approved solar energy facilities located on the Hoekplaas and Klipgats Farms in Prieska and the Badenhorst Dam and Du Plessis Dam Farms in De Aar. The expansion of Hoekplaas Farm includes ten additional 75 MW photovoltaic (PV) facilities, while the expansion of Klipgats Pan Farm includes six additional PV units. The expansion of Badenhorst Dam Farm includes four additional 75 MW PV facilities, and that of the Du Plessis Dam Farm includes three additional PV units. Responsible for management and review of the EIA process and finances. (Mulilo Renewable Energy (Pty) Ltd).

Environmental impact assessment (EIA) for the construction of the bulk water supply scheme (BWSS) at Kalkfeld (Kalkfeld, Namibia) 01/2013 - Date. *Project Leader.* This project entailed an environmental impact assessment (EIA) process for the proposed construction of the bulk water supply scheme (BWSS) for the town of Kalkfeld and surrounding areas, including groundwater abstraction boreholes and a pipeline connecting these to the NamWater Reservoir. Responsible management and review of the EIA process and finances. (Namibia Water Corporation (NamWater)).

Basic assessment (BA) for the transmission lines from the south and north wind energy facilities (WEFs) on the eastern plateau (De Aar 2) near De Aar (Northern Cape Province, South Africa) 11/2012 - 08/2013. *Project Leader.* This project entailed a basic assessment (BA) and environmental management plan (EMP) process for two 132 kV overhead transmission lines connecting two wind energy facilities (WEFs), to be developed to the east of De Aar, to the national transmission grid. The transmission lines will consist of a single servitude approximately 21 km in length, which will feed into Eskom's proposed Bushbuck substation. Responsible for financial management, contract negotiations with sub-consultants, coordinating the multi-disciplinary specialist team, review of specialist reports and compilation of the BA report and EMP. Involved for 2 person-months. (Mulilo Renewable Energy (Pty) Ltd).

Rössing Uranium mine expansion project (Erongo Region, Namibia) 10/2012 - Date. *Project Manager.* The project involved a social and environmental impact assessment (SEIA) for the proposed mining of the Z20 uranium deposit south of the Khan River within Rössing Uranium's mining license area ML28, and the infrastructure corridor to link the Z20 satellite open pit. Aurecon was appointed to undertake the SEIA to obtain the required environmental clearance in terms of the Namibian environmental legislation. Responsible for financial management, contract negotiations with sub-consultants, coordinating the multi-disciplinary specialist team, review of specialist reports, compilation of the SEIA report and environmental management plan (EMP), and presentation at stakeholder forums. Involved for 4 person-months. (Rio Tinto Rössing Uranium).

Basic assessment (BA) for the transmission lines from the Maanhaarberg and Damfontein wind energy facilities (WEF) (De Aar 1), near De Aar (Northern Cape Province, South Africa) 07/2012 - 08/2013. This project entailed a basic assessment (BA) process for two 132 kV overhead transmission lines connecting a two-phased wind energy facility (WEF), to be developed to the west of De Aar, to the national transmission grid. The transmission lines would consist of a single servitude approximately 25.6 km in length, which feeds into Eskom's proposed Eskom/PV3 substation. Responsible for financial management, contract negotiations with sub-consultants, coordinating the multidisciplinary specialist team, review of specialist reports, and compilation of the BA report and environmental management plan (EMP). Involved for 2 person-months. (Mulilo Renewable Energy (Pty) Ltd).

Environmental impact assessment (EIA) for the construction of the bulk water supply scheme (BWSS) at Aussenkehr (Aussenkehr, Namibia) 03/2012 - 10/2012. *Project Leader.* This project included an environmental impact assessment (EIA) process for the construction of the bulk water supply scheme (BWSS) for the town of Aussenkehr. Responsible for coordinating the multi-disciplinary specialist team, review of specialist reports, compilation of the EIA reports and environmental management plan (EMP) and presenting at the stakeholder forums. Involved for 1 person-month. (Namibia Water Corporation (NamWater)).

Strandfontein School integrated waste management plan (IWMP) (Western Cape Province, South Africa) 01/2012 - Date. *Project Leader.* The project entailed the compilation of an integrated waste management plan (IWMP) for the rehabilitation of Erf 14927 and undertaking a Section 24G process to rectify the commencement of the unlawful activities. Responsible for financial management, contract negotiations with sub-consultants, coordinating the specialist team, review of specialist reports and the compilation of the reports. Involved for 0.5 person-months. (Western Cape Education Department)

(WCED)).

Environmental impact assessment (EIA) process for three proposed photovoltaic (PV) energy facilities near De Aar (Northern Cape Province, South Africa) 11/2011 - 09/2013. *Project Leader.* The project entailed an environmental impact assessment (EIA) for three photovoltaic (PV) power facilities near De Aar. PV2 is located on Paarde Valley Farm and generates between 75 and 150 MW; PV3 is located on the Badenhorst Dam Farm and generates between 100 and 135 MW and PV4 is on the Annex Du Plessis Dam Farm, generating 19 MW. The associated infrastructure included 132 kV overhead transmission lines; the upgrading of access roads and water supply infrastructure linking the site to the municipal network. Responsible for financial management, contract negotiations with sub-consultants, coordinating the multi-disciplinary specialist team, review of specialist reports, and compilation of the EIA and basic assessment (BA) reports and environmental management plan (EMP) and presenting at the stakeholder meetings. Involved for 2 person-months. (Mulilo Renewable Energy (Pty) Ltd).

Compilation of the integrated waste and water management plan (IWWMP) for Elitheni Coal in support of a water use licence (WUL) (South Africa) 03/2011 - 07/2012. *Project Scientist.* The project involved undertaking specialist studies and preparing the technical reports in support of the integrated water use licence application (IWULA). Responsible for the preparation of documentation in support of the water use authorisation and liaison with the Department of Water Affairs (DWA). Involved for 0.6 person-months. (Elitheni Coal (Pty) Ltd).

Construction of the Newton Reservoir, pump station and pipeline (Western Cape Province, South Africa) 02/2011 - Date. *Task Leader.* The project entailed an environmental impact assessment (EIA) and the design of the structural and electrical elements for the construction of the Newton Reservoir, pump station and pipeline. Aurecon carried out evaluation of lands; managed the registration of servitudes for the reservoir/pump station site and pipe route; and surveyed the site and pipe route as part of the EIA. Responsible for the preparation of documentation in support of the water use authorisation and liaison with the Department of Water Affairs (DWA). Involved for 0.25 person-months. (Drakenstein Local Municipality).

Environmental impact assessment (EIA) for upgrading the Pretoria Portland Cement (PPC) Riebeeck Plant (Western Cape Province, South Africa) 11/2010 - Date. *Project Leader.* Aurecon was appointed to undertake the environmental authorisation processes required for the proposed upgrade to Pretoria Portland Cement's (PPC's) existing cement manufacturing plant in Riebeeck West. The aim is to align the plant's functioning and operations with the emission requirements now and in the future. The proposed upgrade would increase the operational lifespan of the plant by 30 years. Responsible for coordinating the multidisciplinary specialist team, review of specialist reports, and compilation of the environmental impact assessment (EIA) report and environmental management plan (EMP) and presenting at the stakeholder meetings. Involved for 5 person-months. (Pretoria Portland Cement (PPC)).

Environmental impact assessment (EIA) for the Khanyisa Power Station in Witbank (Mpumalanga Province, South Africa) 09/2010 - 12/2012. *Task Leader.* The project entailed an environmental impact assessment (EIA) for the proposed Khanyisa Power Station near Witbank in order to obtain environmental authorisation. The scope of services involved the quantification of the anticipated impacts on the geohydrological environment caused by the construction, operation and decommissioning of a power plant and associated ash disposal. Responsible for the surface water quality impact assessments (WQIAs) associated with the proposed development. Involved for 0.5 person-months. (Anglo Coal).

Development of the catchment management strategy (CMS) for the Breede-Overberg Water Management Area (WMA) (South Africa) 09/2009 - 05/2013. *Project Scientist.* The project entailed developing a catchment management strategy (CMS) for the Breede-Overberg Water Management Area (WMA). Aurecon was appointed as a technical sub-consultant to provide input to the water resource component of the CMS. Assisted with the compilation of the report on the status of water resources and water resource management strategies. Involved for 0.8 person-months. (Pegasys).

Environmental impact assessment (EIA) for the Brits ferrochrome smelter (North West Province, South Africa) 05/2009 - 02/2011. *Project Scientist.* Quanto Environmental Solutions was contracted to undertake an Environmental Impact Assessment (EIA) for a proposed ferrochrome smelter for ChromTech Holdings (Pty) Ltd outside the Brits industrial area. Quanto approached Aurecon to carry out the surface water quality impact assessment for the EIA. Responsible for the surface water quality impact assessment (WQIA) and developing the water quality monitoring programme. Involved for 0.5 person-months. (Quanto Environmental Solutions cc).

Drakenstein River Management Plan: assessment of the urban reaches of rivers within the

Drakenstein Municipality (Western Cape Province, South Africa) 11/2008 - 02/2011. *Project Scientist.* The project involved the assessment of the urban reaches of selected rivers from an environmental and engineering perspective to guide the development of a practical river management plan. Responsible for the river assessment and assisted with the field investigation of the selected rivers. Involved for 0.1 person-months. (Drakenstein Local Municipality).

Establishment of an integrated water resources management system (IWRMS) (Malawi) 11/2008 - 08/2011. *Project Coordinator.* Aurecon was appointed to establish an integrated water resources management system (IWRMS), including hydraulic and hydrological models and decision support tools, for the National Water Development Programme (NWDP). The project entailed the development and establishment of a management information system (MIS) and supporting databases. The project further consisted of the technical capacity in re-establishing surface water, ground water and water quality monitoring systems. Responsible for coordinating the various sub-consultants, the compilation of project documentation, and the review of all reports before submission to the client. Involved for 2 person-months. (Ministry of Irrigation and Water Development (MoIWD)).

Development of reconciliation strategies for large bulk water supply systems for the Greater Bloemfontein Area (Free State Province, South Africa) 11/2008 - Date. *Project Scientist.* The objective of this project was to develop a strategy that sets out a course of action to ensure adequate and sustainable reconciliation of future water requirements in the Greater Bloemfontein Area for a horizon of at least 25 years. Responsible for managing the sub-consultants, compilation of the reports and project administration. Involved for 2 person-months. (Department of Water Affairs (DWA)).

Development of reconciliation strategies for the Algoa Water Supply Area (Eastern Cape Province, South Africa) 05/2008 - 04/2010. *Project Scientist.* The project entailed developing strategies to reconcile the water supply available from the Algoa Water Supply System (AWSS) with the water requirements up to 2035. Responsible for the compilation of reports and project administration. Involved for 2 person-months. (Department of Water Affairs (DWA)).

Water use authorisation process for identified water uses at the Pretoria Portland Cement's (PPC's) Jupiter cement plant in terms of the National Water Act (NWA) (South Africa) 02/2008 - 11/2008. *Project Scientist.* The project involved an application for a water use authorisation for the Jupiter Cement Plant. Responsible for the compilation of the technical reports in support of the water use licence application (WULA). Responsible for the preparation of documentation in support of the water use authorisation and liaison with the Department of Water Affairs (DWA). Involved for 0.25 person-months. (Pretoria Portland Cement (PPC)).

Compilation of the Volunteer Water Quality Training Manual, the Communication Structures Manual, and the Training Needs Manual for the Adopt-a-River Programme, Phase 2: development of an implementation plan (South Africa) 11/2008 - 02/2011. *Project Scientist.* The aim of the Adopt-a-River Programme was to create awareness and an understanding amongst all South Africans of the need to care for our scarce water resources and to facilitate their participation in the protection and management of these resources in an integrated manner. Responsible for developing the training manual for setting up a water quality monitoring programme (WQMP). Involved for 0.4 person-months. (Department of Water Affairs (DWA)).

Environmental impact assessment (EIA) and environmental management plan (EMP) for the transmission lines for a conventional nuclear power station and associated infrastructure at the Bantamsklip site (Nuclear 1) (Western Cape Province, South Africa) 02/2008 - 11/2008. *Project Scientist.* The project involved undertaking the environmental impact assessment (EIA) for the proposed transmission line from the Bantamsklip site. Assisted with the specialist site visit for identifying possible routes and associated impacts for the transmission line. Involved for 0.2 person-months. (Eskom).

Environmental compliance audits of Eskom's Gourikwa and Atlantis gas turbine power stations (Western Cape Province, South Africa) 02/2008 - 11/2008. *Project Scientist.* The project entailed auditing the construction sites in terms of the environmental management plan (EMP). Responsible for compliance auditing on a quarterly interval. Involved for 1 person-month. (Eskom).

Environmental auditing of the construction of erosion control structures along the Jukskei River (Gauteng Province, South Africa) 11/2005 - 01/2008. *Environmental Auditor.* The project entailed undertaking bi-weekly audits during the construction phase and submitting environmental compliance reports to the client. Responsible for environmental auditing and the compilation of audit reports. Involved for 0.1 person-months. (Johannesburg Roads Agency (JRA)).

Evaluation of the water use licence application (WULA) for Palabora Mining Company (PMC), Twickenham Platinum Mine, Sasol Nitro, and Xstrata Alloys in terms of the National Water Act (NWA) (South Africa) 11/2005 - 01/2008. *Environmental Scientist.* The project entailed the assessment of water use licence applications (WULA) on behalf of the Department of Water Affairs (DWA). Assisted with the drafting of the water use licences in accordance with the National Water Act (Act 36 of 1998) and record of decision. Involved for 4 person-months. (Department of Water Affairs (DWA)).

Gautrain Rapid Rail Link (Gauteng Province, South Africa) 11/2005 - 01/2008. *Environmental Scientist.* The project involved a water use licence application (WULA) for the water use activities triggered by the Gautrain Rapid Rail Link. Assisted with the preparation of the technical report in support of the WULA. Involved for 1 person-month. (Gauteng Department of Public Transport, Roads and Works (GDPTW)).

Gautrain Rapid Rail Link: diversion of a tributary of the Hennops River (Gauteng Province, South Africa) 11/2005 - 01/2008. *Environmental Scientist.* The project entailed applying for an amendment of the Gautrain water use licence (WUL) to include the proposed diversion of a tributary of the Hennops River. Assisted with the preparation of the technical report in support of Section 21 (i) and (c) water uses. Involved for 0.6 person-months. (Gauteng Department of Public Transport, Roads and Works (GDPTW)).

Evaluation of the various water use licence applications (WULAs) in terms of the National Water Act (NWA) (South Africa) 11/2005 - 01/2008. *Environmental Scientist.* The project entailed the evaluation of water use licence applications (WULA) on behalf of the Department of Water Affairs (DWA). Assisted with the preparation of the water use licences (WULs) in accordance with the National Water Act (Act 36 of 1998) and record of decision (RoD). Involved for 1 person-month. (Department of Water Affairs (DWA)).

Assessment of the water use licence (WUL) backlog and the evaluation of the various water use licence applications (WULAs) in terms of the National Water Act (NWA) (South Africa) 11/2005 - 01/2008. *Environmental Scientist.* The project entailed the assessment of water use licence applications (WULA) backlog to better understand the reasons for delays. Responsible for checking on the status of WULAs in Gauteng and in the Western Cape. Involved for 1 person-month. (Department of Water Affairs (DWA)).

Development of a reconciliation strategy for the Crocodile West Water Supply System: water quality assessment report (South Africa) 11/2005 - 01/2008. *Environmental Scientist.* This project involved developing a reconciliation strategy for the Crocodile West Water Supply System. Responsible for data analysis and preparing the water quality assessment report. Involved for 2 person-months. (Department of Water Affairs (DWA)).

Upgrading of the Khutsong wastewater treatment works (WWTW) (Gauteng Province, South Africa) 11/2005 - 01/2008. *Environmental Scientist.* The project involved applying for environmental authorisation for the proposed upgrade of the Khutsong wastewater treatment works (WWTW). Assisted with the compilation of the environmental impact assessment (EIA) reports. Involved for 1 person-month. (Merafong City Local Municipality).

Construction of the Kokosi wastewater treatment works (WWTW) (Gauteng Province, South Africa) 11/2005 - 01/2008. *Environmental Scientist.* The project involved applying for environmental authorisation for the proposed upgrade of the Kokosi wastewater treatment works (WWTW). Assisted with the compilation of the environmental impact assessment (EIA) reports. Involved for 1 person-month. (Merafong City Local Municipality).

Upgrade of the expansion of the Zeekoegat wastewater treatment works (WWTW) (Gauteng Province, South Africa) 11/2005 - 01/2008. *Environmental Scientist.* The project involved applying for environmental authorisation for the proposed upgrade of the Zeekoegat wastewater treatment works (WWTW) and applying for the Water Use Licence in terms of the National Water Act (NWA) (Act 36 of 1998). Assisted with the compilation of the environmental impact assessment (EIA) reports. Involved for 1 person-month. (City of Tshwane).

Construction of the wastewater treatment works (WWTW) for Nolukhanyo (South Africa) 11/2005 - 01/2008. *Environmental Scientist.* The project entailed applying for environmental authorisation for the proposed Nolukhanyo wastewater treatment works (WWTW). Responsible for the environmental impact assessment (EIA). Assisted with the compilation of the EIA reports. Involved for 1 person-month. (Ndlambe Municipality).

Construction of the poultry facility for Bontsi Poultry (Gauteng Province, South Africa) 11/2005 - 01/2008. *Environmental Scientist.* The project involved applying for environmental authorisation for the proposed development of a poultry farm. Assisted with the compilation of the environmental impact assessment (EIA) reports. Involved for 0.6 person-months. (Bontsi Poultry (Pty) Ltd).

Environmental management plan (EMP) and environmental auditing of the new Durban Stadium construction site for the duration of the construction period (KwaZulu-Natal Province, South Africa) 11/2005 - 01/2008. *Environmental Auditor.* The project entailed compiling of an environmental management plan (EMP) and undertaking monthly audits. Responsible for compiling the EMP and compliance auditing on a monthly. Involved for 2 person-months. (Ibhola Lethu Consortium).

Education

2004 : MSc Water Resource Management, University of Pretoria, South Africa
 2002 : Honours, University of Cape Town (UCT), South Africa
 2001 : BSc Microbiology and Plant Pathology, University of KwaZulu-Natal, South Africa

Career enhancing courses

2012 : Project Management: Principles and Methods for Use in Business, University of Cape Town (UCT), South Africa
 2012 : Project Management Course, Aurecon Project Support Office
 2010 : Legal Training Course, Aurecon Group Legal Services
 2010 : Climate Change and Integrated Water Resource Management (IWRM), University of the Western Cape, South Africa
 2009 : Catchment Management Strategy Development for the Breede Water Management Area (WMA), FET Water
 2007 : Environmental Law for Environmental Managers, North West University, Potchefstroom Campus
 2006 : Environmental Impact Assessment (EIA): The National Environmental Management Act (NEMA), North West University, Potchefstroom Campus

Professional affiliations

Professional Natural Scientist, South African Council for Natural Scientific Professions (SACNSP)

Languages

	Reading	Writing	Speaking
English	Excellent	Excellent	Excellent
Afrikaans	Fair	Fair	Fair

Referees

Company	Contact Person	Telephone nr.
Aurecon	Andries van der Merwe	+27 44 805 5427
Aurecon	Dr Chris von Holdt	+27 21 526 5793

Curriculum vitae: Mrs K de BRUYN

Name : DE BRUYN, KAREN
 Date of Birth : 12 December 1987
 Profession/Specialisation : Environmental studies and management
 Years with Firm : 3
 Nationality : South African
 Years experience : 4

Key qualifications

Karen is an environmental scientist with three years' of experience in the environmental management field. She has a wide range of experience in undertaking environmental processes for small and medium to large-scale developments ranging from renewable energy projects, civil projects and general waste related projects to mining projects.

As technical staff, Karen is responsible for compiling reports for both the basic assessment and environmental impact assessment (EIA) processes in accordance with applicable legislation.

Karen is a certified natural scientist with the South African Council for Natural Scientific Professions (SACNSP), a member of the International Association for Impact Assessments South Africa (IAIASA) and also an associate member of the Institute of Waste Management of Southern Africa (IWMSA). She holds a Master of Philosophy degree in Environmental Management and a Bachelor of Science degree in Conservation Ecology, both obtained from the University of Stellenbosch in South Africa.

Employment record

03/2011 - Date Aurecon, Environmental Assessment Practitioner (EAP)
 02/2010 - 02/2011 Anèl Blignaut Environmental Consultants, Junior Environmental Assessment Practitioner (EAP)

Experience record

Mulilo photovoltaic (PV) expansion (Northern Cape Province, South Africa) 03/2013 - Date. *Technical Staff Member.* This project entailed two EIA processes for the proposed photovoltaic energy facilities at Badenhorst Dam Farm and Du Plessis Dam Farm. At Badenhorst Dam Farm, the solar energy project would comprise of four 75MW solar energy facilities. At Du Plessis Dam Farm, the solar energy project would comprise of three 75MW solar energy facilities. Responsible for report compilation, review of specialist reports and public participation process. Involved for 1.27 person-months. (Mulilo Renewable Energy (Pty) Ltd).

Social and environmental impact assessment (SEIA) for the proposed mining of the Z20 uranium deposit. (Erongo Region, Namibia) 10/2012 - 10/2013. *Technical Staff Member.* Aurecon was appointed to manage a social and environmental impact assessment (SEIA) for the proposed mining of the Z20 uranium deposit and the infrastructure corridor linking the mine to the Rössing plant. Responsible for compilation of the scoping, the SEIA and environmental management plan (EMP) reports. Involved for 2.18 person-months. (Rössing Uranium Limited).

Update to environmental and social impact assessment (ESIA) for the construction of the Ministry of Staff houses at Ombika Gate of the Etosha National Park (Etosha National Park, Namibia) 06/2012 - 08/2012. *Technical Staff Member.* The Millennium Challenge Account Namibia (MCA-N) is supporting the Ministry of Environment and Tourism (MET) with regard to infrastructure improvements in Etosha National Park (ENP). An environmental and social impact assessment (ESIA) study in 2010 by Aurecon identified and assessed all environmental and social impacts and developed required mitigation measures for all identified environmental issues for the site on the eastern side of the Ombika Gate (Ombika East). Both the site selection report and the follow-up site specific ESIA study were formally approved and environmental clearance granted by MET in accordance with the Environmental Management Act (EMA) of 2007. However, MET has formally requested that an alternate site on the west side of the road (Ombika West) be included in the assessment for the new staff village at Ombika (Okaukuejo Gate). Responsible for updating the ESIA report, assisting with report writing, presenting results to Interested and Affected Parties (I&APs), site visits and informing adjacent landowners of the additional study. Involved for 1 person-month. (Ministry of

Environment and Tourism).

Construction phase environmental management programme (EMP) for the proposed office building for SANRAL on Erf 39688, Upper Oakdale (Western Cape Province, South Africa) 04/2012 - 05/2012.

Technical Staff Member. SANRAL required additional office space and proposed to develop a business park that would involve the construction of an office building of approximately 3000 m²; widening of the existing Mispel road, additional access roads, landscaping, lighting, parking bays, security and signage. The environmental management programme (EMP) provided a link between the identified impacts and the environmental management required during project implementation. Responsible for compiling the EMP, liaising with client and site visits. Involved for 1 person-month. (SANRAL).

Integrated waste management plan and Section 24 G process to address the illegal waste disposal activities at Strandfontein High School, Mitchell's Plain (Western Cape Province, South Africa) 02/2012 - Date.

Technical Staff Member. The Department of Environmental Affairs and Development Planning (DEA&DP) Directorate: Environmental Compliance and Enforcement, issued Strandfontein Secondary School with a warning letter based on the illegal waste disposal activities on Erf 14927. In response to these illegal activities, the DEA&DP intervened and all disposal activities were ceased. An integrated waste management Plan (IWMP) was compiled and a Section 24 G process in terms of NEMA is being undertaken. Responsible for report compilation, liaising with authorities and site visits. Involved for 4 person-months. (Western Cape Education Department).

Proposed photovoltaic solar energy facilities near De Aar (Northern Cape Province, South Africa) 09/2011 - Date.

Technical Staff Member. Mulilo Renewable Energy proposed to construct three photovoltaic solar energy facilities near De Aar, which would enable them to be taken into consideration as an independent power producer (IPP). The integrated resource plan (IRP) 2010 allows for an additional 14 749MW of renewable energy in the electricity mix in South Africa by 2030, and Mulilo wanted to participate in this programme. The proposed facilities would be able to generate 169MW collectively. Responsible for compiling the scoping reports, the basic assessment report (BAR), conducting the public participation process (PPP) and liaising with all stakeholders. Involved for 4 person-months. (Mulilo Renewable Energy (Pty) Ltd).

Determination of future rehabilitation costs associated with existing landfill sites (Regional, South Africa) 05/2011 - Date.

Technical Staff Member. The project entailed the determination of associated future rehabilitation costs of existing landfill and solid waste disposal sites in line with GRAP 17 requirements. Where licences and permits were lacking, the minimum requirements for rehabilitation as developed by Department of Water Affairs during 1998 were used to ensure compliance. The costing included provision for the relevant environmental processes, civil works and post decommissioning monitoring. Responsible for report writing, finances and management of specialists. Involved for 1 person-month. (Mubesko Africa).

Operational phase management plan of the Sandown Shoprite Checkers in Parklands (Western Cape Province, South Africa) 04/2011 - 05/2011.

Technical Staff Member. As a prerequisite to get the building plans for the Sandown Shoprite Checkers approved, an operational environmental monitoring programme (OEMP) had to be submitted to the City of Cape Town. The OEMP addressed key issues of on-site stormwater management, landscaping and management of a portion of public open space and a retention pond containing floating islands. Responsible for compiling an operation phase management plan. Involved for 1 person-month. (Shoprite Checkers).

Basic assessment process for the upgrade of Distillery Road in Wellington (Western Cape Province, South Africa) 04/2011 - Date.

Technical Staff Member. Drakenstein Municipality was aiming to upgrade a 1.4km section of Stokery Road, starting 200m from the intersection with Main Road 27, Champagne Street, up to the intersection with Main Road 219, Main Street. The geometric layout was upgraded from a 9.2m surfaced road to a 14.8m surfaced road, with 1.8m surfaced sidewalks. This allows for two 3.4m lanes per direction to accommodate the left and right turning of heavy vehicles, and for safer pedestrian usage. The stormwater system upgrade included a concrete culvert to replace the current unlined channel on the western side. Responsible for completing the application form, the basic assessment report (BAR) and the environmental management plan (EMP). Involved for 3 person-months. (Drakenstein Local Municipality).

Borrow pit inspection in Oudtshoorn (Western Cape Province, South Africa) 03/2011 - 03/2011.

Technical Staff Member. The project entailed assisting with the screening evaluation of potential borrow pit sites in the Oudtshoorn Municipal District. The three potential borrow pit sites were assessed in a high level screening process according to suitability from an environmental perspective to take it to the next level of geological investigation. Responsible for assisting the team leader with the compilation of the feedback/screening report of the potential sites that were investigated, and assisting with field work.

Involved for 0.5 person-months.

Education

2011 : MPhil Environmental Management, University of Stellenbosch, South Africa
 2009 : BSc Conservation Ecology, University of Stellenbosch, South Africa

Career enhancing courses

2013 : Project Management, University of Cape Town (UCT), South Africa
 2012 : Certificate in Business Writing for Professionals, University of Cape Town (UCT), South Africa

Professional affiliations

Associate Member, Institute of Waste Management of Southern Africa (IWMSA)
 Member, International Association for Impact Assessments South Africa (IAIASA)
 Certified Natural Scientist, South African Council for Natural Scientific Professions (SACNSP)

Languages

	Reading	Writing	Speaking
English	Excellent	Excellent	Excellent
Afrikaans	Excellent	Excellent	Excellent

Publications

De Bruyn K, and Pretorius D, 2013. "Addressing contemporary recycling problems inherited by poor planning". International Association of Impact Assessments Conference.

Referees

Company	Contact Person	Telephone nr.
Anèl Blignaut Environmental Consultants	Anèl Blignaut	+27 82 751 9596 anel@dpeng.co.za