

Annex H

Detailed CVs of ESIA Project Team

Michael John Everett

Managing Partner
ERM East Africa
Nairobi, Kenya



Michael (Mike) Everett has been working for ERM since 2006 and is currently Managing Partner for ERM East Africa, based in Nairobi, Kenya.

Mike has over 23 years of experience in a range of environmental disciplines. His background includes both full-time employment in government service (working as a hydrologist in the Institute of Water Quality Studies, Department of Water Affairs and Forestry in South Africa) and working as the chief environmentalist at Rio Tinto's Rössing Uranium Mine in Namibia for over five years. Prior to joining ERM, Mike worked as an independent environmental consultant from 2001 to 2006. Between 2004 and 2006, Mike was an invited lecturer on an international training programme held in Sweden and in the Philippines on best practice environmental management in the mining industry.

Since joining ERM, Mike has been involved, either as lead consultant or as coordinator, in a number of projects across a range of sectors throughout the Southern African Development Community (SADC) and East Africa Development Community (EAC) regions, including South Africa, Namibia, Botswana, Mozambique, Zambia, Malawi, Tanzania, Kenya and Ethiopia. He has regularly been involved in liaison and participatory consultations with both government and non-governmental agencies and local communities on a range of development, consultative and project management issues. Mike has also been involved in a number of development agency-funded projects in both Tanzania and Mozambique.

Mike has undertaken a number of Environmental and Social Impact Assessments (ESIAs) for a range of infrastructure projects assessing compliance to the IFC's Performance Standards (PSs) across Africa. A number of ESIs completed by Mike have received very favourable independent reviews by the Southern African Institute of Environmental Impact Assessment (SAIEA), the World Bank and other international financial institutions. Many of these projects have been undertaken in areas rated as high risk by the Control Risks Group (CRG), including Sierra Leone, the afar region of Ethiopia, South Sudan, areas bordering Somalia and the northern regions of Uganda. Working in such areas, it was Mike's responsibility as the project director on many of these projects, to organise full Health and Safety Plans (HASPs), which included

organising a security detail. As such, Mike is familiar with working in high-risk areas and with managing security in line with ERM's expectations and risk tolerances.

Fields of Competence

- Project management
- Integrated environmental and social baseline studies
- ESIA and management plans to IFC PSs
- Geohydrological, hydrological, water quality and air quality modelling
- ISO14001 implementation and maintenance
- Environmental management training programmes
- Health, Safety and Environment (HSE) compliance and due diligence auditing
- HASPs, including managing aspects of project-specific security details

Professional Affiliations & Registrations

- Registered as a Lead Expert and Auditor with the Kenyan National Environmental Management Agency (NEMA), 2014
- Registered as an Environmental Assessment Practitioner in South Africa (EAPSA), 2008

Education

- Mining and the Environment, Lulea University of Technology, Sweden, 1998
- Environmental Auditing, Arthur D. Little, South Africa, 1998
- M.Sc (Hydrology), University of Natal, South Africa, 1991
- B.Sc (Hons) (Hydrology and Soil Science), University of Natal, South Africa, 1989

Languages

- English, native speaker
- Afrikaans, fluent

Key Industry Sectors

- Mining
- Large industrial and infrastructure developments
- Power
- Oil & Gas

Selected Key Projects

ESIAs, ESHIAs and EIAs

Mining Sector

ESIA to IFC standards for water supply scheme in support of a new coal and power plant development in Mozambique, Ncondezi Coal Mozambique, 2013 - current

Project Director

ESIA undertaken to both Mozambique as well as IFC standards. ESIA included detailed environmental flow studies, and a resettlement action plan.

ESIA to IFC standards for a new potash mine development in the Danakil Depression, Yara Ethiopotash, Ethiopia, 2013 - 2014

Project Director

ESIA undertaken to both in-country as well as to IFC standards. Project includes detailed water resources studies, biophysical and biological, social and cultural heritage baselines, and detailed impact assessment and management plans.

ESIA to IFC standards for the Nkout iron ore mine and related infrastructure in the Cameroon. International Mining Infrastructure Company (IMIC), 2013 - ongoing

Environment Reviewer

ESIA undertaken to both in-country as well as to IFC standards. Acted as reviewer on aspects related to water management, soils, air quality and noise.

ESIA to IFC standards for the expansion of a brownfields iron ore mine development in Sierra Leone, London Mining, 2011 - 2013

Project Director

ESIA undertaken to both in-country as well as to IFC standards. Project included a suite of detailed management plans, including a Resettlement Action Plan (RAP).

ESIA to IFC standards for a new Potash Mine development in the Danakil Depression, Allana Potash, Ethiopia, 2011 - 2013

Project Director

ESIA undertaken to both in-country as well as to IFC standards. Project included a RAP, as well as ESIAs for associated infrastructure, namely a 650 km haul road route and port development. The Project received favourable reviews from an Environmental and Social Due Diligence assessment conducted independently and on behalf of the IFC.

ESIA to IFC standards for a new coal mine development in Mozambique. Ncondezi Coal Mozambique, 2010 - 2012

Project Director

ESIA undertaken to both Mozambican as well as to IFC standards. ESIA included detailed surface and groundwater modelling studies in support of the

engineering feasibility study, for both water supply and mine waste disposal options.

ESIA to IFC standards for a coal mine expansion development in Mpumulanga, Kangra Coal, South Africa, 2010 - 2012

Project Director

ESIA undertaken to both South African as well as IFC standards. This project included environmental screening studies for audit locations, in-country permitting requirements, detailed groundwater studies and both waste and water use licence applications.

Review and update of an ESIA to IFC standards for a new uranium mine development in Namibia, Bannerman Mining Resources Namibia, 2009 - 2010

Project Manager

ESIA undertaken to both Namibian as well as IFC standards. ESIA expanded to cover not only the mine but all infrastructure projects in support of the mine, namely rail, roads, water and power infrastructure.

Preliminary Environmental Studies for the Elkon Uranium Project, Russia, Hatch Canada, 2010

Project Specialist

Acted as project specialist on geohydrological, health and safety, and radiation management aspects in support of an overall environmental and social pre-feasibility study for the Elkon Mine.

Power Sector

ESHIA for a hydropower scheme on the Zambezi River, Zambia/Zimbabwe, Zambezi River Authority, 2014 - ongoing

Project Director

ESHIA currently being undertaken to both Zambian and Zimbabwean in-country as well as to IFC and other applicable international best practice standards (namely the IHA and WCD).

ESHIA for two hydropower schemes on the Lunsemwfa River, Zambia, AguaMira / Lunsemfwa Hydropower Company, 2012 - 2013

Project Director

ESIA undertaken to both Zambian in-country as well as to IFC and other applicable international best practice standards (namely the IHA and WCD).

ESHIA for a hydropower scheme on the Kunene River, Namibia/Angola, Permanent Joint Technical Committee for the Kunener River, 2009 - 2012

Project Manager and Director

ESIA is to be undertaken to both Angolan and Namibian as well as IFC and other applicable international best practice standards (namely the IHA and WCD).

Mmamabula Energy Project (MEP) ESHIA, Botswana, CIC Energy Corp., 2006 - 2009

Project Manager

Acted as project manager for the overall project, which involved an ESHIA for two coal mines, a ~2,700MW power plant, transmission lines, road links, well-fields and associated infrastructure. The ESHIA was undertaken to IFC standards.

Well-field development Environmental Impact Assessment (EIA) to support the Mmamabula Energy Project, Botswana, CIC Energy Corp., 2007 - 2008

Project Manager

EIA undertaken in support of the MEP to IFC standards. The well-field project was required as a source of water to the overall MEP.

EIA for a railway line development in southern Malawi as part of the overall Moatize Energy project, Mozambique, CVRD, 2005 - 2006

Project Manager

EIA undertaken to in-country as well as IFC Performance Standards as part of the overall Moatize coal project.

Other

EIA for a proposed cement manufacturing plant in Karibib, Namibia, Karibib Portland Cement, 2008

Project Coordinator

Acted as project coordinator for the Health, Air Quality and Noise Impact Assessments as part of the overall EIA study for this development, which included the cement plant and two limestone quarries.

Environmental Management Systems

Assistance with the certification and maintenance of Environmental Management System (EMS) according to the ISO14001 standard for a range of clients including:

- Rössing Uranium Mine, Rössing Uranium Ltd. Namibia, 1999 - 2000
- Jwaneng Mine, Debswana, Botswana, 2001
- Orapa Diamond Mines, Debswana, Botswana, 2000 - 2002
- Barloworld Namibia, Namibia, 2004 - 2005
- Navachab Gold Mine, AngloGold Namibia, Namibia, 2005 - 2006
- Kabambo Hydropower Project, Copperbelt Energy Corporation, Zambia, 2013

Development and implementation of an Environmental Policy and Environmental Management Plan for NamPower for submission to the Electricity Control Board of Namibia, Namibia, Nampower, 2002 - 2005

Project Manager

This project involved the development of an environmental policy, environmental aspects register and environmental risk assessment, which was conducted in

order to develop an applicable Environmental Management Plan (EMP) for the utility. The work was conducted under the ISO14001 framework and the EMP was accepted by the Electricity Control Board of Namibia.

Compliance and Due Diligence Auditing

Training Course to Swedfund and Norfund Investment Analysts on the implementation of the Equator Principles and the IFC PSs to their portfolio of projects, Kenya, Swedfund/Norfund, 2015

Lecturer

Training provided to Swedfund/Norfund on the Equator Principles and IFC PSs and their implementation.

Environmental and Social Due Diligence (ESDD) on the Berkeley Energy Achwa River Hydropower Project, Uganda, DEG, 2015

ESDD Lead

Acted as ESDD lead for an independent HSE assessment against the IFC PSs of Berkeley Energy's proposed Achwa River greenfields hydropower (40MW) project.

ESDD on the Quantum Power Geothermal Power Project, Kenya, DEG, 2015

ESDD Lead

Acted as ESDD lead for an independent HSE assessment against the IFC PSs of Quantum Power's proposed geothermal power plant within the Menengai geothermal complex.

ESDD on the Ramco Group of Companies, Kenya, Proparco, 2015

ESDD Lead

Acted as ESDD lead for an independent HSE assessment against the IFC PSs of the Ramco Group of Companies, specifically polythene industries, Ramco Printing Works and Platinum Packaging.

ESDD on the Aga Khan Fund for Economic Development, Kenya, Proparco, 2015

ESDD Lead

Acted as ESDD lead for an independent HSE assessment against the IFC PSs of a sample of Aga Khan's IPS Group of companies, specifically the Nation Media Group and Friogoken Limited.

ESDD on the Akiira One Geothermal Development, Kenya, Standard Bank of South Africa / Frontierinvest, 2014

ESDD Lead

Acted as ESDD lead for an independent HSE assessment of Akiira One's proposed greenfields geothermal power project.

Environmental and Social Due Diligence on the Kabambo Gorge Hydropower Project, Zambia, Standard Chartered Bank, 2013

ESDD Lead

Acted as ESDD lead for an independent HSE assessment of Copperbelt Energy Corporation's Kabambo Gorge greenfields hydropower project.

Environmental and Social Due Diligence on the Langer Heinrich Uranium Expansion Project, Namibia, Societe Generale, 2010

ESDD Lead

Acted as ESDD lead for an independent HSE assessment of Paladin Energy's Langer Heinrich Uranium expansion project.

Independent environmental auditor for the Sasol natural gas pipeline: Temane to Ressano Garcia, Mozambique, World Bank and Sasol, 2002 - 2005

Independent Auditor

Acted as independent auditor to the World Bank for the construction phase of this project. Audits were undertaken every three months during the period.

Over eighty audits for a range of clients, including municipalities, port authorities and the private sector (including the mining, power and financial sectors and other large industrial and construction projects)

Auditor

Audits included HSE legal compliance audits to local/national standards, IFC compliance audits, due diligence audits, legal compliance audits as well as ISO14001 surveillance audits.

Other

Mine Closure studies, The Oaks Mine, South Africa, De Beers, South Africa, 2008

Project team member

Part of the overall team overseeing all aspects of mine closure studies for The Oaks mine, including aligning all mine closure programmes with legal requirements.

International training course: The application of EIA, EMPs and EMS in the mining environment, Philippines and Sweden, SIDA, 2004 - 2006

Independent Lecture

Acted as independent lecturer for this international training programme on behalf of CENTEK, Lulea, Sweden. Training courses were given in the Philippines and in Sweden and delegates represented over twenty-five countries.

Integrated Development of the Water Resources Management and Rural Water supplies in the Zambezi River Basin project (ZAMWAT), Tete, Mozambique, European Union, for SEED Lda, 2004 - 2005

Water Quality Specialist

Responsibilities included water quality mapping for the entire Zambezi basin and the setting up of a water quality laboratory for the project.

Training course for the African region: Health, Safety and Environmental Management for small- and medium-scale mining enterprises, Dar es Salaam, Tanzania, Swedish International Development Agency (SIDA), 2003

Independent Lecturer

Acted as independent lecturer for this programme on behalf of CENTEK, Lulea, Sweden. Programme was undertaken on behalf of the Tanzania Chamber of Mines.

Feasibility study for the abstraction of groundwater from the Tsumeb aquifer for use in the Central Area, Namibia, NAMWATER, 2003 - 2004

Assistant Project Manager

Undertook an EIA study as part of an overall feasibility study for the abstraction of groundwater for use in central Namibia from the Tsumeb karst aquifers.

Concurrent mining and rehabilitation plan for African Pre-cast Concrete Industries, Namibia, Barloworld, 2004

Project Manager

Provided a mining and rehabilitation plan based on both legal and best practice requirements.

A closure plan for Rössing Uranium Mine: An assessment of radiation risks to the public and suggested mitigation measures, Namibia, Rössing Uranium, 2001 - 2002

Project Lead

This project involved the modelling of various mine closure options to determine the radiation health risk associated with each scenario. This work formed part of the overall mine closure plan.

A quantitative air quality risk assessment for all airborne pollutants at Rössing Uranium Mine. Namibia, Rössing Uranium, 1999

Project Lead

This project involved the collection and analysis of all air quality data and the development of a risk model to determine health risks to workers and the public surrounding the mine site.

Certification:

I, the undersigned, certify that to the best of my knowledge and belief, this bio-data correctly describes myself, my qualifications, and my experience.

Mike Everett

Date: 23 September 2015

Zoe Day Daniel

Principal Consultant
Impact Assessment and Planning (IAP)



Zoe Daniel is a Principal Consultant in ERM Southern. Zoe has 11 years consulting experience during which time she has managed a number of ESIA's across a range of sectors to international good practice. During this time, she has developed the ability to manage projects under difficult schedule requirements, in remote and challenging locations and involving multi-disciplinary and multi-national teams.

Zoe has been responsible for the management of the work and for day-to-day client contact, work planning, team briefing, production of outputs, and resource and financial monitoring. Through this work, she is experienced in the use of professional project management tools. Zoe has also been trained in PRO - ERM's standardised and integrated approach to the management of large projects.

Fields of Competence

- Project Management
- Environmental and Social Impact Assessment (ESIA)
- Public Consultation and Disclosure

Professional Affiliations & Registrations

- Government of Uganda, National Environmental Management Authority (NEMA) registered EIA Practitioner, 2008 - 2009

Education

- MSc (Environmental Assessment and Evaluation), London School of Economics and Political Science, United Kingdom, 1998
- BA (Political Economy of Industrial Societies and French Minor), University of California Berkeley, USA, 1996
- The School for Field Studies, Sustainable Tourism Development, Island and Tropical Resource Management, Palau, 1995

Languages

- English
- French (working knowledge)

Key Industry Sectors

- Oil and gas
- Hydropower
- Renewable energy

Key Projects

Hydropower

Environmental and Social Impact Assessment for the Proposed Batoka Gorge Hydro-Electric Scheme on the Zambezi River, Zimbabwe and Zambia, Zambezi River Authority, 2014 – current.

The Batoka Gorge Hydroelectric Scheme (HES) is a hydropower development that has been proposed in the central portion of the Zambezi River Basin, at a site 50 km downstream of Victoria Falls. This bilateral hydropower project between Zambia and Zimbabwe includes the construction of a proposed 181 meter high gravity arch dam that would provide up to 800 MW of capacity each for Zambia and Zimbabwe, with a total capacity of 1600 MW. ERM was appointed by the Zambezi River Authority (ZRA) to carry out a revision, gap analysis, verification and update of the body of information contained in the previous studies, and presented as an Environmental and Social Impact Assessment for the proposed Batoka Gorge HES. Zoe was the project manager for this project.

Strategic Environmental Assessment (SEA) for the Baynes Hydropower Project, Namibia and Angola, Government of Angola and Government of Namibia (through the Permanent Joint Technical Commission (PJTC) on the Cunene River Basin), 2014 - current.

The Baynes Committee of the Permanent Joint Technical Commission (PJTC) commissioned ERM to undertake a Strategic Environmental Assessment (SEA) study to identify the environmental and social constraints of the linear and other ancillary infrastructure related to the Baynes Hydropower Project (Baynes HPP). Options relating to the establishment of linear and other ancillary infrastructure needed for the construction and operational phases of the project, particularly powerlines and roads, but also airfield(s), housing facilities and other infrastructure needed to support a staff complement that will both construct and operate the project were considered. The outcomes of the SEA were hosted on a GIS platform, to enable uniformity of design of data collation, management and storage, and to facilitate decision making at all levels by the various stakeholders. Such a spatial analysis approach developed layers for the key sensitivities that need to be considered. These layers were then used to develop an overall sensitivity map of the areas covered by the proposed linear infrastructure to guide in optimal route selection. . Zoe was the project manager for this project.

Environmental and Social Impact Assessment for the Baynes Hydropower Project, Namibia and Angola, Government of Angola and Government of Namibia (through the Permanent Joint Technical Commission (PJTC) on the Cunene River Basin), 2009 – current.

ERM was commissioned to conduct an ESIA for a 600MW hydropower plant located on the Kunene River on the border of Angola and Namibia, approximately 30km downstream of Epupa. ERM undertook the ESIA in two phases: Phase 1 – Scoping; and Phase 2 – Baseline, Impact Assessment and Framework Environmental Management Plan (EMP). The ESIA process was conducted in accordance to the Angolan and Namibian EIA Regulations; the World Bank Safeguard Policies; the IFC performance standards as well as other international guidelines and standards for dam-building. Zoe was the project manager for this project.

Environmental and Social Impact Assessment for the Proposed Mulungushi Hydropower Project, Lunsemfwa Hydropower Company (LHPC), Zambia, 2013 – 2014.

ERM was appointed to undertake an ESIA for the proposed Mulungushi Hydropower Project. The ESIA process was conducted in accordance to the Zambian EIA Regulations, the World Bank Safeguard Policies and the IFC performance standards and in conformance with the World Commission on Dams (WCS) and the International Hydropower Association (IHA) guidelines. Zoe was the project manager for this project.

Environmental and Social Impact Assessment for the Proposed Muchinga Hydropower Project on the Lunsemfwa Lower/Mkushi, Muchinga Power Company (MPC), Zambia, 2011 – 2014.

ERM and African Mining Consultants (AMC) were appointed to undertake an ESIA for the proposed Muchinga Hydropower Project. The ESIA process was conducted in accordance to the Zambian EIA Regulations, the World Bank Safeguard Policies and the IFC performance standards and in conformance with the World Commission on Dams (WCS) and the International Hydropower Association (IHA) guidelines. Zoe was the project manager for this project.

World Commission on Dams (WCD) Compliance Assessment of Bujagali Hydropower Power Project, Bujagali Energy Limited, September – October 2010.

ERM was appointed to conduct a World Commission on Dams (WCD) assessment and Clean Development Mechanism (CDM) validation for the Bujagali Hydropower Project. This included a site visit in order to conduct the assessment and highlight the gaps between existing conditions and referenced WCD guidelines and corrective action requests to address significant compliance issues.

Oil & Gas

East Nile 3D Seismic Survey Environmental and Social Impact Assessment and Environmental Baseline Study, Tullow Oil Uganda and Total Uganda Exploration and Production Company Limited, Uganda, 2011 – 2012.

ERM was commissioned by Tullow Oil to conduct an Environmental Baseline Study (EBS) for the Jobi Rii and Jobi East prospects and an Environmental and Social Impact Assessment (ESIA) and the associated Environmental Management Plan (EMP) for Jobi Rii prospect in preparation for the planned three dimensional (3D) seismic acquisition located in Murchison Falls National Park. Following the farm down of two-thirds of its equity in the Lake Albert basin to CNOOC and Total in February 2012, ERM's contract with Tullow Oil on the Jobi Rii and Mpyo-Bbegeri 3D seismic study was novated to Total Exploration and Production Uganda. Total changed the scope of work which required ERM to prepare a revised impact assessment covering the Jobi Rii and Mpyo-Bbegeri seismic survey programmes combined into one project the East Nile 3D Seismic Survey programme. The ESIA process was conducted in accordance to Ugandan EIA Regulations, the World Bank Safeguard Policies and the IFC performance standards. Zoe was the project manager for this project.

Ndian River Block On-land Exploration Drilling Environmental and Social Impact Assessment, Kosmos Energy Cameroon HC, Cameroon, 2010 – 2011.

Kosmos Energy Cameroon HC is the operator of the Ndian River Block located onshore in the northern part of the Rio Del Rey sedimentary basin in the Republic of Cameroon. Following the 2D seismic ESIA carried out in 2009, Kosmos is currently planning exploration drilling of two wells. ERM was commissioned to undertake an Environmental and Social Impact Assessment (ESIA) and associated management plans in

preparation for the planned exploration drilling in early 2012. Zoe was the project manager for this project.

Ndian River Block EBS and 2D Seismic Environmental and Social Impact Assessment, Kosmos Energy Cameroon HC, Cameroon, 2008 – 2009.

Kosmos Energy Cameroon HC is the operator of the Ndian River Block located onshore in the northern part of the Rio Del Rey sedimentary basin in the Republic of Cameroon. Kosmos is currently planning a two dimensional (2D) seismic acquisition program to delineate prospectivity in the Southern part of the Ndian River Block. ERM was commissioned to conduct an Environmental Baseline Study (EBS) and an Environmental and Social Impact Assessment (ESIA) and the associated Environmental Management Plan (EMP) in preparation for the planned 2D seismic acquisition by the end of 2009. Zoe was the project manager for this project.

Environmental and Social Impact Assessment for an Early Production System for Kaiso-Tonya Area, Exploration Area 2, Tullow Uganda Operations Pty Ltd, Uganda, 2007 – 2008.

ERM was appointed to undertake an Environmental and Social Impact Assessment (ESIA) for an Early Production System. Tullow has an MoU with the Government of Uganda to develop an onshore EPS – the first oil production in Uganda. Zoe was the project manager for this project.

Addendum Environmental and Social Impact Assessment for an Early Production System for Kaiso-Tonya Area, Exploration Area 2, Tullow Uganda Operations Pty Ltd, Uganda, 2008.

ERM was appointed by Tullow Uganda Operations Pty Ltd to carry out an addendum for the ESIA of an Early Production System (EPS). The proposed EPS was initially sited in the Kabwoya Wildlife Reserve and a subsequent site out of the reserve was selected. The EIA addendum evaluated the impacts of the new site. Zoe was the project manager for this project.

Operational Discharges Management Plan for Block 22, Angola, Repsol, Angola, 2013

ERM was appointed to prepare an Operational Discharges Management Plan (ODMP) associated with Repsol's (Repsol) proposed offshore exploratory drilling activities in Block 22.

Environmental Management Programme for Exploration in the Ultra Deepwater Orange Basin Block, Shell, South Africa, 2010.

South Africa's Mineral and Petroleum Resources Development Act requires an Environmental Management Programme (EMPr) to be compiled and submitted to the Petroleum Agency South Africa as part of an application for an Exploration Right. Shell appointed ERM to develop the EMPr. Responsibilities included developing the EMPr including the preparation of Environmental Management Plans (EMPs) for seismic surveys and prospect well drilling.

Environmental, Social and Health Impact Assessment, Angola LNG, Angola, 2005 - 2006.

ChevronTexaco and Sonangol are leading the development of the Angola LNG project. The project is an integrated gas utilisation project, taking gas from offshore production facilities to an LNG plant at Kwanda Base, in north-western Angola. Following on from site selection work conducted in 2002-2004, ERM was awarded the contract for completing a full Environmental, Social and Health Impact Assessment (ESHIA). Responsible for managing all social baseline data collection and analysis, stakeholder consultation and engagement and coordinating specialist team.

West Africa Cable System (WACS) Permits in Principle (Group 1 and Group 2 Countries), Angola, 2009-2011.

WACS is a proposed fibre optic submarine cable that would extend approximately 14,400 km from South Africa to Portugal. The purpose of the project is to increase the overall capacity for transmission of telecommunications data (ie bandwidth) in countries along the Atlantic seaboard of Africa. ERM has been contracted to support environmental permitting for a number of the landing countries for the WACS project. ERM is leading the environmental and permitting studies, with assistance from local environmental, socioeconomic and legal specialists. The work includes undertaking ESIA studies, stakeholder engagement and other permit applications, as required, in ten countries of the 13 WACS participatory countries. Zoe was the task manager for Angola.

Screening and Site Selection

High Level Screening Study, InfraCo Management Services Limited, Uganda, 2010.

ERM was commissioned to undertake a high-level screening of the key environmental and social sensitivities in order to assist in early stage project design. The Project includes the provision of clean water, power supply and lake transport to unserved communities in Lake Albert Uganda.

Screening and Site Selection Study, Saldanha Bay, South Africa, Ilithia Group Holdings, 2009.

ERM was appointed by Ilithia Group Holdings to evaluate alternative sites for marine and land-based sites for an LPG Import Facility at Saldanha Bay. Working with marine and land-based engineers, the Screening and Site Selection Study aimed to demonstrate due-process and balanced evaluation of the social and environmental considerations in selecting the preferred alternative sites.

Screening and Site Selection Study, Port of Saldanha, South Africa, Transnet, 2008.

ERM was appointed by HMG Joint Venture (on behalf of Transnet) to undertake a Screening Study to evaluate alternative berthing options for the future development of the Iron Ore Terminal at the Port of Saldanha. The Screening Study aimed to demonstrate due-process and balanced evaluation of social, environmental, engineering, planning and financial considerations in selecting the preferred berthing option currently included in the Phase 2 Port EIA. Zoe was the project manager for this project.

Screening Study for the Gauteng Basin Plan Studies, Transnet, South Africa, 2007.

Responsible for providing social specialist input on one of the 16 high level strategic environmental and social screening studies for the Gauteng Basin Plan Studies.

International Development

West Africa and South East Asia: Forest Law Enforcement, Governance and Trade (FLEGT), European Commission, DG Development, 2005 - 2006.

The Action Plan for Forest Law Enforcement, Governance and Trade (FLEGT) sets out how the EU aims to work in partnership with wood-producing countries to combat illegal logging and reduce the trade in illegally harvested timber. An inter-service group within the European Commission develops EU FLEGT

policy lead by the Directorate General for Development (DG DEV). ERM is collaborating with DG DEV to keep the EU FLEGT process on track to meet political and public expectations. Responsibilities included providing a range of technical inputs including the contribution of policy papers on development co-operation in order to drive forward the country dialogues on Voluntary Partnership Agreements (VPAs) with member states and partner countries.

Ghana, South Africa: Millennium Development Goal (MDG)s Water and Sanitation Review, UK's Department for International Development (DFID), 2005.

ERM lead the preparation for DFID of a report focused on the performance of the water and sanitation sectors in relation to the Millennium Development Goal's for 12 countries in Africa and Asia. This sharing of experiences and developing of common concepts and principles was used to guide the process of planning, implementing and maintaining water supply and sanitation improvements helping form part of DFID's material for Commission on Sustainable Development (CSD) 13. Responsibilities included carrying out the in-country study in Ghana gathering and analysing data on how Ghana is progressing towards meeting the water MDGs.

Sierra Leone: Environmental screening and appraisal, UK's Department for International Development (DFID), 2006.

Undertook an environmental screening and appraisal of the Malaria Outreach and Safety Initiative (MOSI) project in Sierra Leone. Responsible for producing a DFID environmental screening note (ESN) for the proposed intervention as well as associated environmental appraisal text for the project memorandum, and liaising with relevant country programme office.

Certification:

I, the undersigned, certify that to the best of my knowledge and belief, this bio-data correctly describes myself, my qualifications, and my experience.



Date: 23 September 2015

Tim Smith

Technical Director, ERM UK



Tim Smith is an ERM Technical Director and a Chartered Engineer (Hydrology) and Environmentalist. He has over 20 years' professional experience, during which time has been responsible for directing, managing and providing technical inputs to a wide portfolio of environmental and water resources management projects, relating to:

- Water resources (including water supply, flood risk, catchment management and pollution control);
- Environmental assessment (sectors including water and wastewater services, agriculture, hydropower, mining and oil and gas)
- Environmental policy, plans and strategies; and
- Institutional assessment and capacity building.

His international project experience encompasses many different countries and regions, including the UK, Central and Eastern Europe, the Middle East, Africa, South America, the Caribbean, Central, South, South-East and East Asia and the Pacific.

In addition to significant private sector experience, Mr Smith has also carried out work for a variety of international funding agencies. These include the World Bank, EBRD, United Nations, UK Department for International Development, the European Commission, the European Agency for Reconstruction and Development and the Asian Development Bank.

He was also director (from 2006 to 2008) of the ERM UK Foundation, a charitable organization that contributes to environmental and social investment projects around the world.

Mr Smith has worked for ERM since 1995, prior to which he worked for Mott MacDonald Ltd as a Water Resources Engineer from 1989 to 1995.

Education

- MSc Engineering Hydrology, Imperial College of Science, Technology and Medicine, University of London, 1989
- DIC (Diploma of Imperial College), Imperial College of Science, Technology and Medicine, University of London, 1989
- BSc (1st Class Hons, Pilkington Prize) Physics, Imperial College of Science, Technology and Medicine, University of London, 1988

Professional Affiliations & Registrations

- Chartered Engineer (CEng)
- Chartered Environmentalist (CEnv)
- Member of the Chartered Institution of Water and Environmental Management (MCIWEM)
- Member of the British Hydrological Society

Fields of Competence

- Environmental impact assessment
- Strategic environmental assessment
- Water resources management and pollution control
- Institutional assessment and capacity building
- Environmental policy and planning
- Engineering hydrology

Languages

- English
- French (basic)

Regional Experience

- UK
- Eastern Europe and the NIS
- Africa
- Middle East
- Asia-Pacific
- Latin America & the Caribbean

KEY PROJECT EXPERIENCE

Environmental Assessment

Guinea: Water resources specialist for the preparation of a Social and Environmental Impact Assessment of a planned iron ore mine, including railway and port facilities. For a confidential client, 2011 to date.

Jordan: Technical Director for the Environmental and Social Assessment of the Red Sea-Dead Sea Water Conveyance Project. For the World Bank, 2008 to date.

Croatia: Expert for an environmental performance review of the livestock, crop production and agro-processing facilities of a large producer. For the Deutsche Investitions- und Entwicklungsgesellschaft mbH (DEG), 2011.

Congo (DRC): Water resources specialist for the Environmental and Social Appraisal of the Inga 3 Hydropower Development Project in Democratic Republic of Congo. For a confidential client, 2010.

Cameroon: Hydrology expert within team carrying out an independent review of the Environmental and Social Assessment prepared for the the Lom Pangar Hydropower Project. For the European Investment Bank, 2011.

Poland: Team leader for the preparation of an Environmental and Social Assessment for a seismic survey in support of a shale gas exploration project. For a confidential client, 2010.

Uganda: Environmental expert for an Environmental and Social Performance Review of a coffee plantation. For the Uganda Investment Authority/DEG, 2009.

Namibia: Water resources specialist for preparation of the Baynes Hydropower Dam EIA. For the Baynes Development Secretariat, 2009 to date.

Kenya: Water resources expert for the preparation of an ESIA for a proposed sugar cane plantation and processing plant in Msambweni District. For the Kenyan International Sugar Company (KISCOL), 2010.

Nigeria: Environmental audit and RSPO appraisal of palm oil plantation and processing plant. For a confidential client, 2009 to date.

Ghana: Water resources specialist for preparation of the EIA for the Lake Volta timber harvesting project. For CSRD, 2007-2008.

Ghana: Water resources specialist for preparation of the Biu Hydropower Dam EIA. For the Biu Development Commission, 2006-2007.

Serbia: Strategic Environmental Assessment (SEA) specialist for a pilot project to carry out an SEA of the Serbian industry action plan. For the EC/European Agency for Reconstruction, 2006 to 2008.

Mozambique: Team Leader for strategic environmental assessment of national sugar industry expansion plans. For the Mozambican Association of Sugar Producers (APAMO), 2006.

Fiji: Team Leader for strategic environmental and social appraisal of national sugar industry investment plans in response to the EU Sugar Protocol reforms. For the Fiji Sugar Commission, 2005.

Kazakhstan: Preparation of an environmental assessment of Tendyk Fodder Production Scheme. For the EC Sustainable Development of Caspian Coastal Communities Project, 2005.

Albania: Preparation of an environmental assessment and environmental management/monitoring framework for the Natural Resources Development Project. For the World Bank, 2004 to 2005.

Mauritius: Team Leader for strategic environmental and social assessment of sugar industry reform plans. For the Mauritian Sugar Association, 2004.

Iran: Water resources specialist for supplementary environmental assessment of the Alborz Integrated Land and Water Management and Dam Project. For the World Bank, 2004.

Iran: Team Leader for the preparation of environmental management plan and institutional assessment for the Tehran Sewerage Project. For Yekom and the World Bank, 2003.

Albania: Responsible for preparation for preparation of an environmental risk assessment and management plan for oil and gas exploration/drilling activities in the Narta Lagoon. For UNDP/GEF, 2002.

Russia: Preparation of a regional environmental risk and sensitivity assessment for major oil & gas acquisition in the Russian Federation. For a confidential client, 2002.

Romania: Review of EIAs relating to two municipal wastewater treatment plant ISPA applications. For the European Commission, 2002.

Russian Federation: Environmental review of Perm Municipal Water Services Development Project. For Carl Bro and EBRD, 2001.

Turkey: Environmental review of Illisu Hydro-Electric Dam Project Proposal. For the UK Export Credit Guarantee Department (ECGD), 1999-2000.

Georgia: Team Leader for the environmental assessment of the Community Irrigation and Drainage Project. For the World Bank, 2000-01.

Bangladesh: Water quality impact assessment in support of an EIA of a proposed gas development in Syhlet, Bangladesh. For a Confidential Client, 1996.

Ukraine: Preparation of an environmental management plan for a pilot coal mine closure programme in the Donetsk region. For the World Bank, 1996.

UK: Water quality impact assessment in support of an EIA of an agrochemicals processing plant development in North-East England. For a confidential client, 1996.

Latvia: Partial environmental analysis of Daugava River Hydropower Rehabilitation Scheme. For the EBRD, 1995.

UK: EIA of a proposed gravel extraction north of Hertford. For a Private Client, 1991.

Water Resources Management & Pollution Control

Europe: Water resources expert for a 2-year study to examine the technical and economic efficiency of water supply networks in water-scarce environments across the EU. For the European Commission, 2011 to date.

US and South America: Water resources expert for the development of a sustainability management system for a global biofuels company. For a confidential client, 2009 to date.

UK: Water resources expert for pre-acquisition audit of potential impacts of EC Water Framework Directive on future operations of major water utility in the south-east. For a confidential client, 2006.

Serbia: Soil & Water Working Group Leader for preparation of the National Sustainable Development Strategy, European Agency for Reconstruction, 2006-07.

China: International Team Leader for the Rural Non-Point Source Pollution Control Project. For the State Environmental Protection Agency (SEPA) and the ADB, 2002-2004.

Serbia: Agri-Environment Working Group Leader for preparation of the National Environmental Action Plan (NEAP), European Agency for Reconstruction, 2004-2005.

St Lucia: Water resources expert for the project 'Strengthening of Environmental and Water Resources Management Framework'. For the World Bank and WASCO, 2003-2004.

Mauritius: Water resources expert for the project 'Alleviation of Water Pollution by Agroindustry in Developing Countries'. For NRI and the ODA, 1996.

Brazil: Team Leader for the project 'Planning and Environmental Management for the Pirapama Basin - Pernambuco', DFID, 1997-2000.

West Bank: Project Director for the Hebron Water Access and Storage Project, Phase 1. For DFID, 1999-2001.

Libya: Groundwater modelling and resource assessment for the Western Jamahiriya System Master Plan. For a Confidential Client, 1993-94.

UK: Groundwater modelling and assessment for the River Darent low flow assessment study. For the National Rivers Authority Southern Region, 1995.

UK: Groundwater modelling and assessment for the Upper Great Stour Catchment Abstraction Study. For the National Rivers Authority Southern Region, 1995.

UK: Resource assessment of groundwater development proposals at Thetford. For the National Rivers Authority Anglian Region, 1993.

Institutional Assessment & Capacity Building

Southern Mediterranean: Project Director for the 3rd Short and Medium Term Priority Action Plan (SMAP III) Technical Assistance Project to support the implementation of integrated coastal zone management and sustainable development practices across the region. For the European Commission, 2007 to 2009.

India: Environmental Institutions Specialist for the project 'Organisational Strengthening of the Madhya-

Pradesh Environmental Planning and Coordination Organisation (EPCO). For DFID, 2005 to date.

Serbia: Project Director for ERM's support to the Environmental Capacity Building Project. For DHV and the European Agency for Reconstruction, 2003-06.

Georgia: Lead trainer for course on EIA Legislation and Best Practices in the EU. For the Caucasus Environmental NGO Network (CENN), 2002.

Poland: Training course on Public Participation in EIA for the project 'Strengthening Capacity for Project Development & Implementation'. For Carl Bro and DFID, 2002

Swaziland: Project Director for the project 'Institutional Development and Change Management' for the Swaziland Environmental Authority (SEA) and DFID, 2000.

UK: Preparation of a United Nations Business Guide. For the UK Department for Trade and Industry (DTI), 1998.

Environmental Policy & Planning

Worldwide: Review of international agricultural and livestock performance standards for the development of a sustainability policy for a major international financier. For a confidential client, 2010.

Central Asia: Project Director for project to strengthen and support implementation of the Aarhus Convention (on public access to environmental information) in the five Central Asian States. For the European Commission, 2007 to 2009.

Russia: Project Director for the project 'Harmonisation of Russian Industrial Pollution Prevention and Control Standards'. For the European Commission Tacis programme, 2002-2004.

Moldova: Team Leader for the regulatory assessment of organic farming proposals under the Agricultural Pollution Control Project, for the World Bank/GEF, 2002-2003.

NIS: Project Director for the study 'Obstacles and Opportunities to Commercialising Urban Water Services in the Newly Independent States', DFID, 1999-2000.

NIS: Project manager for the project 'Development of Common Environment Policies for Newly Independent

States and Mongolia'. For the European Commission Tacis programme, 1997-1999.

Thailand: Team Leader for the review and finalisation of the State of the Environment Report for the Asian and Pacific Region. For UNESCAP/ADB, 2000.

Lithuania, Poland & Bulgaria: Evaluation of country Approximation Strategies for the implementation of EU water quality legislation. For the European Commission, 1997-1999.

UK: Preparation of study on UK Environmental Management Best Practices. For the UK Overseas Development Administration, 1995-1996.

Finland, and several ASEAN countries: Support to World-wide Environmental Issues Tracking for a Major Multinational Company, 1995.

Engineering Hydrology

Mr Smith provided inputs as a hydrologist/hydraulic modeller to the follow studies during his time at Mott MacDonald Ltd:

Sudan: Gash River Flood Protection Scheme, For the African Development Bank, 1994-95.

Mozambique: Limpopo Railway Rehabilitation Phase III - Hydrological Study. For the Overseas Development Administration, 1994-95.

UK: Moat Brook Hydrological Assessment. For a Private Client, 1994.

Ghana: Urban Drainage Design for Accra Urban Transport Project. For the World Bank, 1994.

UK: Callander Flood Forecasting Model Development. For the Central Regional Council, 1993-94.

UK: Callander Phase II Flood Alleviation Study. For the Central Regional Council, 1993.

UK: Ouse Washes Counter Drain Modelling Study. For the National Rivers Authority Anglian Region, 1992-93.

Mozambique: Limpopo Railway Rehabilitation - Bridgeworks Hydrological Study. For the Overseas Development Administration, 1992.

UK: Botley Culvert Relining - Hydrological Study. For a Private Client, 1992.

UK: River Trent Floodplain - Derwent to Colwick Hydraulic Model. For the National Rivers Authority Severn-Trent Region, 1992.

UK: River Soar Flood Capacity Appraisal. For the National Rivers Authority Severn-Trent Region, 1991.

Ghana: Urban II Drainage Master Plan Development, Accra. For the World Bank, 1990-91.

Tanzania: Dar-Es-Salaam to Kigoma, Railway Cross Drainage. For the European Commission, 1990.

Tanzania: Tabora - Kigoma Trunk Road Improvement Hydrological Assessment. For the World Bank, 1990.

UK: Yorkshire Water - New Sources Development. For a Private Client, 1989.

Selected Publications

In addition to numerous reports and technical outputs relating to the above projects:

Evans, T.E., Smith, T.M. and Gill, B. 1995. *Flood Management of the Upper Teith Basin, Above Callander*. British Hydrological Society, Fifth National Hydrology Symposium, Heriot-Watt University, Edinburgh.

Waughray, D.N., Smith, T.M. et al. 2000. *Urban Water Pricing Reform in the NIS: Obstacles and Opportunities*. In Economic Instruments and Water Policies in Central and Eastern Europe: Conference Proceedings. The Regional Environmental Center for CEE, Szentendre Hungary, June 2001. ISBN 963 8454 93 8; pp137-149

Certification:

I, the undersigned, certify that to the best of my knowledge and belief, this bio-data correctly describes myself, my qualifications, and my experience.



Date: 23 September 2015

Andrew Edward Cauldwell

Principal Consultant
Impact Assessment and Planning (IAP)



Andrew Cauldwell is training as a Technical Director, and leads the Biodiversity component for ERM's Sub-Saharan Africa Division. Andrew is qualified in Wildlife Management, is a registered ecologist with the South African Council for Natural Scientific Professions and has 25 years of professional experience in environmental consulting and protected area management.

Andrew has been involved in numerous ecological interventions (Baseline, Impact Assessments, Mitigation, Management, Action and Rehabilitation Plans) for Power (including many Hydropower projects), Infrastructural (Ports, Road & Rail), Mining, Oil & Gas, Agriculture & Forestry and the Conservation/Protected area sectors in most of the developing African nations. Andrew also has extensive experience in conducting due diligence studies, impact assessments and development of practical biodiversity mgmt/action plans within a diversity of habitats ranging from rainforests, savannahs and grasslands to extreme desert conditions including many critical habitats with high sensitivity. Andrew has provided a key interaction with clients, marketing and proposal development, team leadership, mentoring and implementation of best practice, project review and Quality Control.

Andrew has a sound understanding of the IFC performance standards (particularly PS6), FSC, RSPO and SAN certification standards. He has extensive experience in applying the standards to projects over a wide range of conditions. He participates in the South African Mining and Biodiversity Forum (SAMBF), which has a regional area of influence. His work has been acknowledged by the IUCN and South African provincial authorities.

Fields of Competence

- Specialist components of ESIA's and Action plans to International Finance Corporation (IFC), ICMM, certification & various company standards including:
 - Ecological Risk Assessment
 - Critical habitat, HCV and ecological assessment
 - Ecosystem services assessments
- Protected area management

Professional Affiliations & Registrations

- Pr.Sci.Nat. Ecology (membership: 400213/09)
- South African Wildlife Management Association
- Grassland Society of Southern Africa
- Birdlife South Africa

Education

- MSc (Wildlife Management), University of Pretoria, South Africa, 1998
- BSc Hons (Wildlife Management) University of Pretoria, South Africa, 1994
- BSc (Agric), University of Natal, South Africa, 1987

Languages

English, Afrikaans, KiSwahili

Key Industry Sectors

- Infrastructure
- Power
- Oil and Gas
- Mining
- Food and Agriculture

Key Publications

Caro, T.M., Young, C.R., Cauldwell, A.E. & Brown, D.D.E. 2009. Animal breeding systems and big game hunting: Models and application. *Biological Conservation* 142 (4).

Baldus, R.D., & Cauldwell, A.E. 2005. Tourist hunting and its role in development of wildlife management areas in Tanzania. *Proceedings of the 6th International Game Ranching Symposium July 6-9, 2004*. International Foundation for the Conservation of Wildlife, Paris

Zieger, U. & Cauldwell, A.E. 1998. *Wildlife Ecology & Management, practical aspects for Zambian game ranches*. Self published (ISBN: 0-620-22924-1)

Selected Projects of Relevance

ESIA for the Batoka Gorge Hydropower Scheme for the Zambezi River Authority. November 2014 and ongoing. Role: Biodiversity Technical Lead

A comprehensive ESIA was developed for the above hydropower scheme on the Zambezi River, covering biodiversity, social, heritage, tourism, hydrology and other aspects. The ESIA builds on baseline data collected for older ESIA for earlier projects of the same scheme. Biodiversity components have been compiled together with Black Crystal consultants, Zimbabwe and Sourthern Waters, South Africa. A focus has been placed on habitat assessments, Taita falcons, general wildlife and environmental flow studies.

Biodiversity Management Plan (BMP), Kabompo Hydropower - Copperbelt Energy Corporation, Zambia, Feb 2015.

Role: Project Mgmt and Biodiversity Technical Lead

A BMP was compiled for the Kabompo Gorge Hydroelectric Project in northern Zambia. Various Environmental Impact Statements (EIS) reports were independently compiled for each of the project components and a BMP was requested by international lenders to demonstrate how the project will comply with the IFC standards with emphasis on Performance Standard 6. ERM's studies for the BMP included site assessments, stakeholder engagement, comprehensive management measures and a review of the feasibility of implementing an offset to compensate for residual biodiversity impacts.

Mulungushi Hydropower Project. Kabwe, Zambia. 2013. Role: Biodiversity Technical lead

ESIA for upgrading of an old hydropower development through rerouting of additional water and development of underground power generating facilities. Biodiversity studies involved assessment of terrestrial ecology and detailed environmental flow assessments.

Risk Assessment for Diamond and Oil Exploration, Botswana and Tanzania, May 2013.

Risks posed by ecological and protected area status were assessed for two large clients (Mining and Oil & Gas) considering exploration and establishment of operations adjacent to and with protected areas.

Ongoing Support and Reforestation Action Plan (RAP) for an Agricultural Tea Estate in southern Tanzania, October 2014

Role: Project Manager and Technical Lead

A confidential RAP was compiled for a large agricultural estate to facilitate recertification following loss of forest from clearing. The RAP included a site assessment, mandatory and recommended actions, a timeframe and monitoring measures.

ESIA for three different potash solution mines, road & port, Northern Ethiopia, 2012–ongoing.

Role: Biodiversity Technical Lead in each ESIA

Three independent ESIA's for Allana, Yara and Circum Minerals were jointly undertaken with in-country specialists to meet IFC Standards. The projects are based in an extreme desert habitat up to 120 m below sea level. Biodiversity components include terrestrial, aquatic and ecosystem services assessments. Projects have included assessment of haul roads to the Djibouti Port and power transmission lines to Mekelle town.

Due Dilligence for the IFC and a large Palm Oil and Rubber production company in West Africa. May 2015 and ongoing. Role: Biodiversity Technical Lead

Due Dilligence studies have been conducted to meet IFC Performance Standards, Roundtable on Sustainable Palm Oil certification (RSPO) and Forestry Stewardship Council certification (FSC) standards for four plantations averaging 30,000 ha each in Cote d'Ivoire, Liberia and Sierra Leone.

Due diligence supervision for assessment of a coastal oil refinery site for the Gabon Government. May 2013 Biodiversity and Physical Technical Lead

Assessment of biodiversity and physical parameters of a coastal site and mangrove-dominated estuary in Port Gentil, Gabon for development of an oil refinery.

Environmental Due Diligence and Compliance on a Mine on the KZN Coast, July 2014. Role: Biodiversity Technical Lead

A confidential assessment was conducted to advise one of the South African Banks on whether a proposed coastal dune mining operation had applied appropriate due diligence to their impacts on habitats of High Conservation Value and offsetting of wetland loss.

Screening Assessment for development of the SUKARI Sugar Plantation in southern DRC. March 2015. Role: Biodiversity Technical Lead

A biodiversity and social screening assessment of the key issues for establishment of a large sugar plantation on the shores of lake Tshangalele in collaboration with ecologists and sociologists from the University of Lubumbashi (UNILU).

Ornithological Risk Assessment for Establishment of a Wind Farm in the Rift Valley, Tanzania, Nov 2013.

Role: Biodiversity Technical Lead

The expected risks and impacts of establishing a wind farm adjacent to an IBA and within the migration routes of several waterbird species, with emphasis on flamingos, was assessed.

ESIA development for four iron ore mines, road, rail and port, two clients, Liberia, 2012

Biodiversity Technical Lead

This project involves the development of six independent ESIA's of four proposed open cast iron ore sites as well as road rail and port developments for two independent clients in Liberia covering both brownfield and remote greenfields sites. Some greenfields sites are within primary rainforest habitats that are potentially Tier 1 Critical Habitats involving high level biodiversity risk assessment and scientific peer review.

Review of a ESIA for an Ethanol Plant in Central Mozambique. April 2015

An ESIA compiled for an Ethanol Plant on the banks of the Zambezi River was reviewed in detail to assess compliance with the MICOA approved Terms of Reference, compliance with 2006 and 2012 IFC Performance Standards, robustness of the methodology used, relevance and adequacy of mitigation, gaps and recommend a way forward.

Biodiversity Action Plan Review and Revision, MMG Kinsevere Mine, Katanga, DRC, Oct 2013.

Role: Project Mgmt and Biodiversity Technical Lead
Biodiversity Technical Lead for review and updating of the existing BAP for the Kinsevere Copper Mine. Use of the MMG BAP template was pioneered following consultation with mine and community stakeholders. Emphasis of the BAP was placed on reconstruction of critical habitat for copper-tolerant plant species, and community involvement is averting loss of biodiversity over the greater area.

ESIA development for a seismic survey in the central Ethiopian Rift Valley, Ethiopia, July 2013

Role: Biodiversity Technical Lead

An ESIA was developed for a proposed seismic survey for oil exploration in a 45,000 km² block within the Rift Valley. The area includes eight large lakes, several protected areas, extensive natural and cultivated habitats. Extensive consultation was held with national, regional and district (Woreda) authorities as field survey and community consultation to assess ecological sensitivity and ecosystem services. The study includes and Impact Assessment and major inputs into an EMP.

ESIA development for an iron ore mine, Sierra Leone, 2011 - March 2013 - Biodiversity Technical Lead

An ESIA was undertaken to meet both Sierra Leone in-country and IFC standards. The ESIA contains a strong

biodiversity component with assessment of a brownfields iron ore mine; haul road and barging route through an Important Bird Area and Ramsar wetland. Biodiversity studies have covered detailed vegetation, ornithology, other fauna and aquatic ecological assessments. Responsibilities included involvement in extensive ESIA compilation and project management.

**ESIA for a Zinc Mine, Northern Cape, Feb 2013
Biodiversity Technical Lead**

Development of a comprehensive ESIA to client standards (based on IFC standards) for a zinc mine in sensitive and irreplaceable inselberg habitats. Includes comprehensive impact assessment and offset strategy. Duties have involved technical leadership for high profile subcontractors, impact assessment and consolidation of biodiversity components of the ESIA.

**Protected Area Mgmt, Tanzania (prior to joining ERM)
Technical Advisor to Wildlife Division 1999 to 2006**

Kagera Kigoma Game Reserves Rehabilitation Project funded by the EDF to support the management of Burigi, Biharamulo, Kimisi, Ibanda, Rumanyika, Moyowosi & Kigosi Game Reserves covering approx. 26,000 km². Involved improving reserve management, infrastructure development, boundary demarcation, funding anti-poaching operations compiling mgmt. plans and initiating community conservation projects.

Advisory Services to the Zambian Game Ranchers Association. 1996 (prior to joining ERM)

Provided advisory support to the developing Game Rancher's Association in Zambia, which culminated in writing the book: Wildlife Ecology & Management, practical aspects for Zambian game ranches. (See key publications).

Certification:

I, the undersigned, certify that to the best of my knowledge and belief, this bio-data correctly describes myself, my qualifications, and my experience.



Date: 23 September 2015

Nadia Mol

Principal Environmental Consultant
Impact Assessment and Planning



Nadia Mol is a Principal Consultant within the ERM Impact Assessment and Planning Division based in Cape Town.

Nadia Mol is a Principal Consultant and Registered Professional Natural Scientist with 17 years of experience in the field of environmental authorisation applications (predominantly in the South African context), with studies in other African countries being focussed towards meeting international lender requirements. This experience has been multi-faceted and has included taking on the roles of project manager, technical manager and reviewer as well as stakeholder engagement manager and facilitator. She has been involved in all phases of environmental authorisation applications from screening through to compliance auditing. Her recent experience, as necessitated by the legislative context of South Africa has been to undertake multiple authorisation and permit applications through a single authorisation process.

Since 2010, Nadia has also managed resettlement planning projects in Kwa Zulu Natal, Mpumalanga and Zambia and gained extensive experience in the complexities of resettlement planning in the African context.

Her experience has been predominantly focussed on the mining sector (coal, heavy minerals, platinum, gold, diamonds, cement) with several of her projects being industrial and linear in nature.

She has the experience of running complex environmental authorisation projects in Zimbabwe and Democratic Republic of Congo and has participated in due diligences as the environmental and social lead in Mali, Eritrea and Ghana as well as undertaking a closure planning project as the social lead for a heavy minerals operation in Madagascar.

Fields of Competence

- Environmental and Social Impact Assessments
- Basic Assessments
- Stakeholder engagement
- Resettlement planning
- Screening studies
- Compliance auditing
- Closure planning (involvement in)
- Due diligence (involvement in)

Professional Affiliations & Registrations

- Registration in terms of the South African Council for Natural Scientific Professions as a Professional Natural Scientist Reg no 400159/09
- Member of the International Association for Impact Assessment, South African Branch

Education

- BSc (Hons) (Environmental and Geographical Science), University of Cape Town, South Africa, 1994

Languages

- English

Key Industry Sectors

- Mining
- Industry

Key Projects

Environmental and Social Impact Assessment for the Proposed Batoka Gorge Hydro-electric Power Scheme, current

Stakeholder Engagement, Resettlement and Social Impact Assessment Lead

Nadia is currently involved in the Environmental and Social Impact Assessment that ERM and its local partners is undertaking for the Zimbabwe River Authority. The project is for the proposed development of a hydroelectric dam and associated infrastructure on the Zambezi River, thus impacting on the countries of Zambia and Zimbabwe. Nadia is the Lead for Stakeholder Engagement, Resettlement Planning and the Social Impact Assessment. This project is currently in the Scoping Phase of investigation.

Environmental Authorisations for the Zulti South Mining Lease Area, Kwa-Zulu Natal, Richards Bay Mining, 2011 to current.

Project Manager and Technical Reviewer

Nadia has been involved in the management of the Zulti South Project in Richards Bay for the past 3 years. This role has entailed the management of a multi-disciplined team and specialists, reporting, technical review, stakeholder engagement process review and extensive client and team liaison. The project is one of a multi-authorisation/permit application nature, requiring authorisation in terms of 4 pieces of South African legislation through a single authorisation process.

Environmental Authorisations for the Limpopo West Mine, Limpopo Province, South Africa, Sasol Mining, 2012 to 2014.

Project Manager and Technical Reviewer

Nadia has been involved in the management of the Limpopo West Project in the Lephalale area of the Limpopo Province of South Africa for 2 years. This role has entailed the management of a multi-disciplined team and specialists, reporting, technical review, stakeholder engagement process review and extensive client and team liaison. The project is one of a multi-authorisation/permit application nature, requiring authorisation in terms of 4 pieces of South African legislation through a single authorisation process.

Resettlement Action Plan for the Zulti South Project, Kwa Zulu Natal, South Africa, Richards Bay Mining, 2010 to 2013.

Project Manager

Nadia was the Project Manager for the development of a Resettlement Action Plan to address the physical and economic displacement of households associated with

the development of the Zulti South Mine to the south of Richards Bay and its associated linear infrastructure.

This role has entailed the management of a core team, extensive engagement with affected communities and households, review of all project work, and extensive client and team liaison. The project has addressed the complexities of resettlement in an African, customary context in accordance with international best practise and compliance with the International Finance Corporation.

Environmental and Social Impact Assessment for the proposed Kusipongo Project, Mpumalanga, South Africa, Kangra Coal, 2013 to present

Stakeholder Engagement Manager

Nadia was the Stakeholder Engagement Manager for the Environmental and Social Impact Assessment undertaken for the proposed Kusipongo underground coal mining project in the Piet Retief area. This role entailed the development of stakeholder engagement materials, development of a stakeholder engagement plan, facilitation of meetings, reporting, client and team liaison.

Resettlement Action Plan Review, Southern Province, Zambia, EMCO, 2013

RAP Reviewer

Nadia was the Reviewer for a Resettlement Action Plan undertaken in Zambia for a proposed new coal mine. The Resettlement Action Plan had been undertaken by a local consultant and was audited against the requirements of the International Finance Corporation.

Environmental and Social Impact Assessment for the Proposed Kalumines Mine, Lumbumbashi, Democratic Republic of Congo, TEAL Mining 2010 to 2011.

Project Manager

Nadia has been involved in the management of the proposed Kalumines Mining ESIA which was undertaken to meet international lender requirements. This role has entailed the management of a multi-disciplined team and specialists, reporting, technical review, stakeholder engagement process review and extensive client and team liaison.

Closure Management Plan Review for QMM Madagascar, 2011.

Social and Stakeholder Engagement Reviewer

Nadia was the social and stakeholder engagement reviewer of Rio Tinto's QMM Closure Plan and Planning Process. This role entailed a site visit, development of a stakeholder engagement plan, review of all existing work and proposed closure plans and reporting.

Environmental Authorisations for Samancor Co-Generation Projects, Mpumalanga and Limpopo Provinces, South Africa, Sasol Mining, 2010 to 2011.

Project Manager and Technical Reviewer

Nadia has been involved in the management of three environmental impact assessments for proposed expansions to 3 of Samancor's plants as part of a co-generation project. This role has entailed the management of a multi-disciplined team and specialists, reporting, technical review, stakeholder engagement process review and extensive client and team liaison.

Certification:

I, the undersigned, certify that to the best of my knowledge and belief, this bio-data correctly describes myself, my qualifications, and my experience.



Date: 23 September 2015

David Shandler

Partner



David Shandler brings thirty years of experience to his role as a partner in ERM Southern Africa with extensive and diverse experience in sustainability and social consulting.

He has built a focus on strategy formulation and strategic management, social consulting, stakeholder engagement and conflict management. His work has come to focus increasingly on working with clients and stakeholders to find solutions to complex social and environmental problems.

He has built a strong body of experience in the field of resettlement, including projects focussed on resettlement planning, monitoring and evaluation and guidance on resettlement implementation.

He is a skilled and experienced mediator in situations of conflict, with a particular emphasis on conflicts in the fields of development and environmental management. He is highly experienced in the practice of stakeholder engagement in diverse contexts, having worked with the full spectrum of stakeholders in developed and underdeveloped situations.

He has worked extensively with diverse sectors, both public and private in numerous countries in Africa, the Americas and Europe.

He has led training for diverse groups and is an occasional lecturer in post-graduate programmes at universities in South Africa.

Fields of Competence

- Resettlement Planning, Monitoring and Evaluation
- Conflict Management and Dispute Resolution
- Stakeholder Engagement Strategy and Management
- Multi-Stakeholder Group Facilitation Socio-Economic Policy Formulation
- Socio-Economic and Political Research and Analysis
- Monitoring and Evaluation
- Sustainability Strategy Formulation
- Social Impact and Risk Assessment
- Training and Development

Education

- MA (Economic History), University of Cape Town, 1991
- BA Hons (Economic History), University of Cape Town, 1985
- BA (Comparative African Government and Law), University of Cape Town, 1983

Languages

- English
- Afrikaans

Key Industry Sectors

- Oil and Gas
- Mining
- Transport
- Government
- Infrastructure Development
- Urban Development and Management
- Conservation and Natural Resource Management

Key Projects

Resettlement

Resettlement Planning Framework, Platreef, South Africa, 2014

Partner in Charge

Led a team in formulating a resettlement framework to global standards to guide the company in addressing economic displacement and physical resettlement associated with the establishment of a new mine.

Action Review of Community Resettlement Programmes in the Limpopo Province, South Africa, 2008 to 2009

Partner in Charge

Led a team of consultants reviewing against global standards of a controversial resettlement process on behalf of a major mining client, and the facilitation of action responses involving all key stakeholders.

Resettlement Action Plan for the Motlhotlo Community, South Africa, 2012 – 2013

Technical Director

Provided technical leadership to team developing a resettlement action plan to global standards for a community required moving as a result of mining development in the midst of heightened levels of conflict.

Implementation of the Mogalakwena Resettlement, South Africa, 2014 – 2015

Advisor

Acted as a high level advisor to a resettlement to ensure its compliance with international standards.

Monitoring and Evaluation of the Motlhotlo Resettlement, South Africa, 2015

Partner in Charge

Led a team conducting a period monitoring and evaluation of the implementation of a resettlement process so as to provide guidance on adherence to international standards and to advise of course correction where required.

Resettlement Action Plan for a Housing Development, Abuja, Nigeria, 2009 to Present

Partner in Charge

Led a team advising on, and guiding, the development of a resettlement action plan to global standards associated with a large scale housing development.

Preliminary Livelihoods Plan Development, South Africa, 2015

Partner in Charge

Led a team developing a livelihoods reestablishment plan to global standards associated with a major economic displacement associated with a mining project.

Interim Resettlement Plan, Mozambique, 2014

Technical Lead

Led the technical process for the development of an interim resettlement plan for a linear road development in rural Mozambique.

Resettlement Dispute Mediation, South Africa, 2010 to 2012

Partner in Charge

Led a mediation team seeking agreement between a major mining company and a community refusing to be voluntarily resettled.

Resettlement of the Protea Village community, 2006

Stakeholder Engagement Leader

Led a team facilitating the participation of a forcibly moved community's involvement in planning their access to the land.

Stakeholder Engagement, Group Facilitation and Conflict Mediation

Stakeholder Engagement Strategy and Implementation, Iron Ore and Manganese Ore Line Expansion Project, South Africa, 2011

Partner in Charge

Led a team developing strategy and implementing stakeholder engagement process for the upgrade of an ore line and port for six mine companies and a transport utility

Mediation of Dispute between Offshore Cable Developer and Fish Trawling Industry, South Africa, 2010

Mediator

Led a mediation process involving the developer of an offshore telecommunications cable and a representative body for the deep sea fish trawling industry to resolve conflict over the future requirements of both parties.

Proposed New Tailing Dam Facilities, 2009 to 2010

Partner in Charge

Led a team conducting a stakeholder engagement process as part of an environmental and social impact assessment in a highly conflictual setting for a major mining client.

Proposed Extension of Urban Solid Waste Landfill Site, Durban, South Africa, 2009 to 2010

Led a team undertaking a research and stakeholder engagement process in a highly charged urban setting.

Stakeholder Engagement in the Planning for the Integrated Rapid Transit System, Cape Town, 2009 to 2010

Partner in Charge

Led a team undertaking a stakeholder engagement process for the implementation of the first phase of the integrated rapid transit system

Environmental Baseline Assessment for a Major Coal to Liquid Facility, Limpopo Province, South Africa, 2008

Social Partner in Charge

Led the stakeholder engagement process for an Environmental Baseline Assessment for a proposed combination coal mine, coal to liquid plant and urban settlement.

Mine Closure Process, Limpopo Province, South Africa, 2008

Social Partner in Charge

Led a stakeholder engagement process associated with the proposed closure of a diamond mine.

Proposed New Container Terminal in the Port of Durban, South Africa, 2006 - 2008

Stakeholder Engagement Leader

Led a team facilitating stakeholder engagement and mediating conflict in the planning of a major new container terminal.

Revitalisation of Cape Town Station, 2006 to 2010

Stakeholder Engagement Leader

Led the stakeholder engagement team in facilitation of stakeholder engagement in the revitalisation and redevelopment of the main city railway station over a five to fifty year planning horizon.

Grand Parade Revitalisation, Cape Town, 2005 - 2008

Leader of Facilitation Team

Led an extensive process of stakeholder engagement and mediation of a high traffic multi-use open space.

Stakeholder Forum for the Management of Saldanha Bay and Langebaan Lagoon, 2005

Project Leader

Led a team that facilitated the establishment of a multi-stakeholder forum to manage a key industrial and conservation-worthy bay.

Future of Culemborg Area, Cape Town, 2006

Mediator

Acted as a mediator between national, provincial and local government authorities as well as a national transport utility on the future of a large area of derelict rail yards.

Ethekwini Municipality preparation for World Summit on Sustainable Development, 2002

Leader of Facilitation Team

Led a team of facilitators working with the councillors of the Ethekwini Municipality on their preparation for participation in the World Summit.

Dispute over Development in the Mhlanga Estuary, Durban, 2004

Mediator

Acted as a mediator in a dispute between a range of interest groups affected by proposed development in a metropolitan estuary.

Dispute over Development in the Hawaan Forest, Durban, 2004

Mediator

Acted as a mediator in a dispute between a land developer, the city authorities and other interest groups over a proposed development adjacent to a protected area.

Dispute over Development of a new Botanical Garden, Durban, 2006

Mediator

Acted as a mediator in a dispute between the city authorities and other interest groups over a proposed new botanical garden for the city.

Land Acquisition Dispute Mediation, 2001 - 2002

Mediation Team Leader

Acted as leader of the mediation team in reaching an agreement between a major land owner, the Cape Town city authority and the Cape Peninsula National Park.

Planning of Foreshore Freeway, 2001 - 2002

Stakeholder Engagement Team Leader

Acted as the leader of a team facilitating stakeholder engagement in a controversial project to finalise an elevated freeway in Cape Town.

Coastal Management Policy Programme 1998 - 2001

Stakeholder Engagement Team Leader

Led the process of engaging stakeholders along the entire length of the South African coast and elsewhere in formulating a national policy.

Western Cape System Analysis, 1995 - 1997

Leader of Public Engagement Team

Acted as the leader of a team which involved a full cross section of stakeholders in the formulation of a region-wide water resource plan for the Western Cape, South Africa.

Stakeholder Participation Advice and Management

Country Stakeholder Engagement Strategy, Mozambique, 2014

Technical lead on project for global oil and gas major stakeholder engagement strategy and plan at the country and operational levels

Support on managing conflict associated with offshore seismic survey, South Africa, 2014

Provided specialised conflict management support to global oil and gas major which was in conflict with highly mobilised civil society stakeholders

Support on Stakeholder Engagement Strategy Design for offshore seismic survey, Namibia, 2014

Provided specialised support to oil and gas major initiating an off shore seismic licensing process as part of a new country entry strategy.

Advice on Conflict Management and Stakeholder Engagement, West Rand, South Africa, 2009 Partner in Charge

Led a team providing advice to a major mining client on stakeholder engagement and advice on community – mine operations conflict

Guidelines on Land Use Planning and the Mining Industry, International Council for Mining and Minerals, 2008 – 2009

Project Advisor

Acted as a high level reviewer and content advisor on land use planning and stakeholder engagement themes.

Corporate strategy and tools for stakeholder engagement for a leading diversified mining company, 2007

Project Leader

Acted as an advisor and content developer of stakeholder engagement strategy and support tools.

Tools to support stakeholder engagement in southern African mining operations for the International Council for Mining and Minerals, 2006

Project Leader

Acted as a leader of a team that reviewed trends and developed tools to guide community engagement by mining companies operating in southern Africa.

Handbook on Stakeholder Participation in Environmental Assessment in Southern Africa for the Southern African Institute for Impact Assessment, 2005

Project Leader

Acted as a leader of a team that compiled case studies on engagement in EIA processes in southern Africa, and formulated a manual to guide this activity targeting all stakeholders.

Policy and guidelines for stakeholder participation in spatial planning for the City of Cape Town, 2006

Project Leader

Led a project that researched best practice and formulated a guide book on stakeholder engagement in land use planning processes.

Integrated participation and communication strategy, Alfred Nzo District Municipality, South Africa, 2006

Project Leader

Led a project to review, research and develop a community participation and communication strategy for a district municipality in an isolated and underdeveloped rural area.

Offshore Oil and Gas survey EIA, Mozambique, 2006 – 2008

Advisor

Acted as an advisor to a professional team conducting a large-scale EIA on all aspects of stakeholder engagement.

Drug Procurement Strategy for National Government, 2004

Project Leader

Led a team that facilitated a multi-stakeholder process to draft a new strategy for government.

Sustainable Development Policy, Analysis, Strategy, Monitoring and Evaluation

Monitoring and Evaluation of National Energy Efficiency Programme in South Africa for UNIDO, South Africa, 2014 – 2015

Partner in Charge

Led a team undertaking a preliminary and final impact assessment of a national programme to increase energy efficiency in industry

Study on the socio-economic impact of a national energy efficiency programme in South Africa for UNIDO, 2015

Partner in Charge

Led a team undertaking an initial study on a sample of enterprises to establish the socio-economic impact of their increased levels of energy efficiency

Monitoring and Evaluation of Mitigation Action Plans and Scenarios, 2011 - 2012

Partner in Charge

Led a team in the monitoring and evaluation of a four country programme to develop national climate change scenarios and mitigation plans in Brazil, Chile, Peru and Colombia.

Monitoring and Evaluation of the Mvula Water Supply Programme, 2009

Partner in Charge

Led a team appointed to monitor and evaluate the programme of water supply extension in rural areas of South Africa conducted under the auspices of the Mvula Trust

Development of National Climate Change Adaptation Indicators for South Africa, 2014

Partner in Charge

Led a team that developed a set of indicators to be used in the application of a monitoring and evaluation methodology for application on climate change adaptation action in South Africa

Development and Roll Out of a Social Impact Assessment Methodology for the Transnet Group, 2014

Partner in Charge

Led a team developing and implementing a complex integrated social impact methodology for the Transnet Group of companies.

Local Economic Development and Entrepreneurship Development Baseline, 2009 to 2010

Partner in Charge

Led a team undertaking baseline research and strategic advice for a major mining client on prospective investment in local economic development and entrepreneurship promotion.

Establishment of a Cleaner Production Centre for Durban, 2006

Project Leader

Led a team that researched and facilitated a multi-stakeholder process to plan the establishment of a cleaner production centre.

Local Economic Development Implementation Plan for Bitou Municipality, 2007

Project Leader

Led a team that formulated an implementation plan for a coastal resort that is a major tourist attraction but also suffers acute poverty.

National Wetlands Strategy, South Africa, 2006

Project Leader

Acted as the leader of a process that engaged a wide array of stakeholders in formulating a strategy for the national wetlands protection programme.

Building capacity in community based natural resource management in the Western Cape Province, South Africa, 2006

Project Leader

Led a team that developed and implemented a capacity building programme on community-based natural resource management for government, community and NGO roleplayers.

Sustainability financing mechanism for the Ethekwini Municipality, South Africa, 2004

Project Leader

Led a team that developed a strategy to raise funding for building sustainability into the management of a metropolitan authority.

EThekwini Environmental Policy Initiative, 1997 – 2005

Project Leader

Acted as the leader of a city-wide multi-stakeholder policy and strategy formulation initiative to manage Durban's environment.

Cape Town Metropolitan Spatial Development Framework, 1991 – 2001

Stakeholder Engagement Leader and Facilitator

Led the stakeholder engagement process in the formulation of a city-wide multi-stakeholder spatial planning initiative.

Policy, Social Impact and Risk Assessment

Social Impact Measurement, Transnet, 2014 – Current

Partner in Charge

Led a team working with Transnet to develop, pilot and roll out a methodology to determine the social impact of the company's operations.

Community Safety Risk Management Plans, Anglo American Platinum

Partner in Charge

Led a team in the formulation of community safety plans for all mining operations for a major mining company.

Bay of Natal Estuary Management Plan, 2010 to Present

Partner in Charge

Led a team developing an integrated estuary management plan for the Bay of Natal, involving a cross-section of key stakeholders, interests and disciplines.

High Level Social Risk Assessment for a Proposed Coal Mining Operation in Northern South Africa, 2009 to 2010

Partner in Charge

Partner in charge of a study to assess potential social risks, including social conflict, human rights, cultural and livelihood impacts for a major mining client.

Social Baseline Study for a Major Coal to Liquid Facility, Limpopo Province, South Africa, 2008

Social Partner in Charge

Led social baseline studies for an Environmental Baseline Assessment for a proposed combination coal mine, coal to liquid plant and urban settlement.

Social Impact Assessment of a proposed Upgrade to a Freight Rail line in the Northern and Eastern Cape, South Africa, 2008

Social Partner in Charge

Led a process of social impact assessment for a proposed series of upgrades on an extensive rail line

Social Risk Assessment for a Proposed Disposal of a Mining Operation, South Africa, 2008

Partner in Charge

Led a team of senior consultants undertaking a risk assessment for a major mining client seeking to withdraw from a well established mining operation and associated settlement

Environmental Planning of a Proposed Oil Drilling Site on the shore of Lake Albert, Uganda, 2008

Partner in Charge

Led a team of consultants advising an oil and gas exploration and development company in advising on an appropriate approach to environmental planning and assessment for a proposed drilling operation

Strategy Formulation

Country Stakeholder Engagement Strategy and Plan, ENI East Africa, Mozambique, 2014 – 2015

Technical Director

Led the process of developing a country-level strategy and plan for stakeholder engagement for business operations in Mozambique of a multi-national oil and gas company

New Country Entry Social Investment Strategy, Mozambique, 2014

Partner in Charge

Led a team working with a global oil and gas major considering a new country entry in East Africa with a focus on developing a strategic approach to position social investment in a way which is aligned with country needs and interests

New Country Entry Engagement Strategy, West Africa, 2014

Technical Lead

Facilitated a client internal discussion on the groundwork for a new country entry strategy for a global oil and gas major making a country entry in West Africa

Vedanta Resources, (KCM), Zambia, 2013

Partner in Charge

Developed a Stakeholder Engagement Plan for KCM's mining operations in Zambia.

Anadarko, Country Stakeholder Engagement Strategy, Mozambique, 2012

Partner in Charge

Led a team in the preparation of a country engagement strategy for a new oil and gas entrant to Mozambique.

Sasol Petroleum International, Country Stakeholder Engagement Strategy, Botswana, 2012

Partner in Charge

Led a team in the preparation of a country engagement strategy for a new country entry for an oil and gas producer.

BP, Southern Africa Corporate Affairs Strategy, 2011 – 2012

Partner in Charge

Led a team developing a corporate affairs strategy for broad-based portfolio for BP Southern Africa.

Coal of Africa Limited, Corporate Stakeholder Engagement Strategy, South Africa, 2012

Partner in Charge

Led a team in formulating a corporate engagement strategy for a company facing extensive stakeholder challenges.

Coal of Africa Limited, Project Stakeholder Engagement Strategy, South Africa, 2012

Partner in Charge

Led a team in the formulation of a project stakeholder engagement strategy

Transnet National Port Authority, Stakeholder Engagement Strategy, South Africa, 2012

Partner in Charge

Led a team in the development of a strategic response to stakeholder challenges for a manganese terminal in the Port of Port Elizabeth

Anglo American Thermal Coal, Development of Stakeholder Engagement Strategy, South Africa, 2010 to 2011

Partner in Charge

Led a team developing a stakeholder engagement strategy for a mining operation in a socially and environmentally sensitive area.

Anglo American Platinum, Corporate Community Engagement and Development Strategy, South Africa, 2008 to 2011

Partner in Charge

Partner in Charge of annual cycles of strategy development for corporate community engagement and development strategy for a major mining client

Anglo American Platinum, Development of Stakeholder Engagement Strategy, South Africa, 2011-2012

Partner in Charge

Partner in Charge of developing an engagement strategy for a highly conflictual mine – community environment

Sustainability Strategy, 2010 - 2011

Partner in Charge

Led a team developing a corporate sustainability strategy for a national diversified food manufacturer

Stakeholder Engagement Strategy, 2011

Partner in Charge

Led a team developing a stakeholder engagement strategy for a potentially controversial mining operation in the Limpopo Province of South Africa

Certification:

I, the undersigned, certify that to the best of my knowledge and belief, this bio-data correctly describes myself, my qualifications, and my experience.

A handwritten signature in black ink, appearing to read "Shandler". The signature is written in a cursive style with a large initial "S".

Date: 23 September 2015

CURRICULUM VITAE: Peter Tarr (PhD)

Surname: Tarr Name: Peter

Date and place of birth: 20/2/1958, Cathcart, South Africa

Nationality: Namibian (South African Permanent Resident)

Civil Status: Married with 2 children (born 1985 and 1989)

Address (phone/fax/e-mail): +264 61 220579, 259183, peter.tarr@saiea.com

Education (excluding short courses):

Institution	Dates	Achievement
Cathcart High School, South Africa	1976	Matric with university exemption
Pretoria Technikon, South Africa	1980-1982	National Diploma Nature Conservation
University of Aberdeen, Scotland	1994-1995	MSc in Environmental Management and Planning
University of Aberdeen, Scotland.	1995-1999	PhD in Environmental Management and Planning

Language skills (Mark 1 to 5 for competence, where 5 is the most competent):

Language	Level	Spoken	Written
English	<i>Mother Tongue</i>	5	5
Afrikaans	Proficient	4	4
Xhosa	Proficient	4	3
German	Proficient	2	1

Membership of Professional Bodies:

- Southern African Institute of Ecologists and Environmental Scientists
- International Association for Impact Assessment
- Environmental Assessment Professionals of Namibia.

Membership of committees, trusts or bodies

- Advisor to NEDBANK on the Go-Green Trust Fund (since 2007 – ongoing)
- Associate Researcher of the Council for Scientific and Industrial Research (CSIR), South Africa (since 2005 – ongoing)
- Committee member – Environmental Assessment Professionals of Namibia
- Extraordinary Associate Professor, North West University (Potchefstroom campus), Faculty of Natural Sciences, Research Unit for Environmental Science and Management, South Africa (2013 – ongoing).
- Research Fellow, Rockefeller Foundation Bellagio Centre, Italy (May/June 2013).

Other skills:

- Computer literacy: MS Word and MS PowerPoint
- Leadership and strategic planning
- Training, workshop facilitation and public speaking
- Research, policy analysis and report writing

Professional awards:

- Namibian Scientist of the Year, 2005
- International Association for Impact Assessment, Individual Award, 2013.

Employment record

Date	Employer and position
2001-present	Southern African Institute for Environmental Assessment (SAIEA) <ul style="list-style-type: none"> Executive Director
1998-2001	Government of Namibia (Ministry of Environment and Tourism) <ul style="list-style-type: none"> Head: Directorate of Environmental Affairs (DEA)
1992-1998	Government of Namibia (Ministry of Environment and Tourism) <ul style="list-style-type: none"> Planning Officer (Principal-Chief)
1986-1992	Government of Namibia (Ministry of Environment and Tourism) <ul style="list-style-type: none"> Nature Conservation Officer (West Coast Recreation Area)
1982-1986	Government of Namibia (Ministry of Environment and Tourism) <ul style="list-style-type: none"> Ranger – Skeleton Coast Park

Specific experience in **environmental consulting** (which includes provision of guide-and-review services, studies and report compilation, audits, Environmental Assessment, policy and strategic advice, etc.) under themes:

Safeguard Tools: Best Practice Guidelines

<i>Country</i>	<i>Date</i>	<i>Client, name of project and brief description</i>
Global	2007	Assist with the development of the OECD/DAC SEA guidelines
Western Indian Ocean Region	2007	UNOPS: Provide guidance to the WIO-LAB project on the reduction of land based pollution on the coastal and marine environments, and the implementation of the Nairobi Convention.
Southern Africa	2008	IAIA: Integration of biodiversity concerns in impact assessment in southern Africa. For the International Association for Impact Assessment (IAIA) – part of the global CBBIA project
SADC	2012	UNOPS: Compile guidelines on Transboundary EA in the context of the Orange-Senqu river basin (for ORASECOM).
SADC	2013	USAID: Compile guidelines on Transboundary EA in the context of the Okavango river basin (for OKACOM).
Pakistan	2014	IUCN: Compile guidelines on Transboundary EIA for natural gas pipelines between Pakistan and neighbouring countries
Global	2014	USAID: Compile environmental guidelines for dryland agriculture (3 rd author)

Strategic planning and policy development

<i>Country</i>	<i>Date</i>	<i>Client, name of project and brief description</i>
Namibia	1994	Government of Namibia: Preparation of Namibia’s Environmental Assessment Policy (author)
Namibia	1995	Government of Namibia: Preparation of Namibia’s policy for the development of Management Plans for parks (protected areas) (author)
Africa	1999	United Nations: Report on “The environment and sustainable development in Africa” – component of Africa’s Long Term Planning Study (ALTPS) – co-author.
Namibia	2001	Government of Namibia: Preparation of the National Assessment for the Johannesburg Earth Summit Meeting (Rio +10) – core team member
Namibia	2001	Government of Namibia: Preparation of Namibia’s VISION 2030 project – co author.
Africa	2004	World Bank: Facilitate, coordinate and compile an “Environmental Assessment and Management Capacity Building Strategy for Africa” on behalf of EA networks in East, Central, Southern and West Africa.
SADC	2004	United Nations: Advise the governments of South Africa, Namibia and Angola on the need to harmonise environmental policies, laws and regulations relating to offshore mining, dredging and petroleum exploration off the south-west coast of Africa (part of a GEF-funded project on the joint management of the Benguela Marine Ecosystem)
Africa	2005	Government of Finland: Assist Finnish Ministry of Cooperation and Development with a review of their cooperation policy.

Namibia	2007	World Bank (GEF): Coordinate review of policies, laws and institutional arrangements for the management of the Namibian coastal environment (NACOMA project)
Lesotho, Namibia, Botswana South Africa	2007	UNDP (GEF): Conduct a Transboundary Diagnostic Analysis (TDA) and preliminary Strategic Action Plan (SAP) of the Orange/Senqu river basin
Africa	2010-11	Develop Africa EA Barometer – on behalf of CLEAA and co-funded by various donor agencies (SIDA, World Bank, USAID).

Strategic Environmental Assessment (SEA)

<i>Country</i>	<i>Date</i>	<i>Client, name of project and brief description</i>
Zambia, Botswana and Zimbabwe	2006	African Development Bank and FAO: (Team leader of a team of 6) - <u>SEA</u> for the Agriculture based Rural Development Programme in the mid-Zambezi area.
Lesotho, Namibia, Botswana South Africa	2007	UNDP (GEF): Conduct a Transboundary Diagnostic Analysis (TDA) and preliminary Strategic Action Plan (SAP) of the Orange/Senqu river basin.
Namibia	2008	Millennium Challenge Corporation (MCC): (Team Leader and technical input in a team of 15) - <u>SEA</u> for the US\$305 million MCC programme for Namibia. The programme included livestock, rangeland, tourism, education and indigenous natural product components.
Namibia	2009-10	Ministry of Mines and Energy: (Team Leader and technical input in a team on 40) - <u>SEA</u> for the ‘Central Namib Uranium Rush’.
Namibia	2010	Ministry of Lands and Resettlement: (Team leader of a team of 5) - <u>SEA</u> for the Karas Land Use Plan.
Namibia	2012	Ministry of Lands and Resettlement: (Team leader of a team of 5) - <u>SEA</u> for the Hardap Land Use Plan.
Namibia	2013	Ministry of Lands and Resettlement: (Team leader of a team of 5) - <u>SEA</u> for the Kavango Land Use Plan.
Angola, Namibia, South Africa	2012-13	Benguela Commission: Conduct Scoping Study for the SEA of the Benguela Current Large Marine Ecosystem (Team Leader in team of 7).
Namibia	2013	Ministry of Environment and Tourism: Rapid SEA of the 4 th National Development Plan. Co-author in team on 3

Tourism, conservation planning and coastal management

<i>Country</i>	<i>Date</i>	<i>Client, name of project and brief description</i>
Namibia	2000	Government of Namibia: Environmental Assessment for community-based tourism proposals: Kwando triangle, Bwabwata National Park
Namibia	2000	Government of Namibia: Study on Environmental Impacts of tourism in Etosha National Park and the Sossusvlei area of the Namib-Naukluft park – guidance document for the Minister of Environment and Tourism
Namibia	2002	World Bank: Write Terms of Reference for the Environmental Assessment for the ‘Integrated Ecosystem Management in Namibia through the National Conservancy Network’ project, and guide and review the EIA.
Namibia	2002	PriceWaterhouseCoopers: Audit of environmental impacts of Namutoni rest camp, Etosha National Park
Namibia	2002	Namibian Community Based Tourism Association (NACOBTA): Mini-audit of Kuidas Camp (lodge), Kunene Region
Namibia	2003	World Wide Fund for Nature (WWF): External review of the north-west tourism masterplan (Kunene Region)
Namibia	2003	Namibian Community Based Tourism Association (NACOBTA): Guide and review the EIA for the proposed tourism lodge at Spitzkoppe (Kunene Region)
Namibia	2003	Lianshulu Lodge (PTY) Ltd and IRDNC: Tourism Development Plan for Mamili National Park

Namibia	2004	Government of Namibia: Environmental Management Plan for the proposed Grootberg Lodge
South Africa	2004	ACER Africa: Review Strategic Environmental Assessment for the Greater St Lucia Wetlands Park, KwaZulu Natal Province
Namibia	2004	UNDP-GEF: Conservation needs assessment for strengthening Namibia's Protected Areas Network (Team leader)
Namibia	2004	Namibian Community Based Tourism Association (NACOBTA): Environmental management plan for the proposed Nyae Nyae camps, Brandberg Lodge and Twyfelfontein visitor centre and site protection programme (the latter funded by the European Union)
Namibia	2005	Lion Investment Company: Guide and review the EIA and EMP for the Purros Lodge, Kunene Region, northwestern Namibia.
Namibia	2005	Redmountain Lodge CC: Guide and review the EIA for the Redmountain Lodge, Kunene Region, northwestern Namibia.
Moçambique	2005	Bazaruto National Park: Tourism sector advisor to the Moçambique government in the context of the Strategic Environmental Assessment for the Bazaruto Archipelago. In this case, subcontracted by the Netherlands Commission for EIA
Namibia	2005	Namibia Eco Awards: Lead compiler of the Eco-Awards Criteria for the Namibian Tourism Industry, and then co-compiler of the "best practice" guidelines for Eco Tourism. Contracted by the European Union and the Namibia Nature Foundation.
Namibia	2005	Gobabeb Training and Research Centre: Scoping study for two proposed lodges in the Kuiseb River area of the Namib Naukluft Park, Namibia.
Namibia and Angola	2006	UNOPS: Conduct Threats Assessment for Namibian and Angolan coastal and marine environments. Part of the Benguela Current Marine Ecosystem project.
Namibia	2007	Legal Assistance Centre /NMF: Assess impacts of prospecting and mining in the Skeleton Coast Park, and recommend changes to the way prospecting and mining licenses are issued and managed.
Namibia	2008	World Bank; Compile management and development plans and regulations for three National Parks and Recreation Areas in western Namibia (in team of 5).
Namibia	2010	UNDP: Research and compile report on vulnerability of Namibia's Protected Areas to Climate Change (Joint Team Leader in team of 10)
Namibia	2010	WWF UK: Research and compile report on realignment of Namibia's CBNRM Programme in light of Climate Change (Team Leader)
Namibia	2011	National Heritage Council: Compile management and development plan and regulations for Spizkoppe Conservation Area in western Namibia (in team of 3).
Namibia	2012	Ministry of Mines and Energy: Compile Management Plan for the proposed Gondwanaland Geo-Park
Botswana	2012	Ministry of Environment and Tourism: Compile Environmental Thresholds Report for the Okavango Delta Ramsar Site (Team Leader in team of 5) – part of SAREP project.

Agriculture and fisheries

<i>Country</i>	<i>Date:</i>	<i>Client, name of project and brief description</i>
Namibia	2001-2004	Government of Namibia: Prepare Terms of Reference and guide and review the Environmental Assessment Study for the proposed Caprivi Sugar Sector Project.
Namibia	2001	J & P Group, Namibia: Prepare Terms of Reference and guide and review the Environmental Assessment for the Mariental Pig Farm, central Namibia.
Namibia	2002	Government of Namibia: Prepare Terms of Reference and guide and review the Environmental Assessment Study for the proposed Liambezi Fisheries Project.
Angola, Namibia, South Africa	2003	UNOPS: Review of policy and legislative environment regarding environmental safeguards pertaining to the marine environment (in collaboration with the University of Cape Town). Part of the Benguela Current Large Marine Ecosystem Project, funded by GEF.
Namibia	2004	Government of Namibia: Prepare Terms of Reference and guide and review the Environmental Assessment Study for the proposed Sendelingsdrift irrigation Project (dates and grapes).
Angola, Namibia, South Africa	2004	UNOPS: Review of policy and legislative environment regarding environmental safeguards pertaining to mining, petroleum exploration and production and dredging in the marine environment. Part of the Benguela Current Large Marine Ecosystem

		Project, funded by GEF.
Namibia	2007	Prime Investments Pty Ltd: Prepare Terms of Reference and guide and review the Environmental Assessment Study for the proposed Kavango Biodiesel Project (<i>Jatropha curcus</i>)

Power supply and transmission

<i>Country</i>	<i>Date:</i>	<i>Client, name of project and brief description</i>
Namibia	2002	NAMPOWER: Guide and review the Preliminary Environmental Assessment for the proposed Popa Falls Hydropower Project
Namibia	2003-05	NAMPOWER: Guide and review the Environmental Assessment for the following proposed powerline projects: Aries-Gerus - Otjikoto 400Kv, Ojikoto-Lifa 400Kv, Kokerboom-Namib 400Kv, Tsumeb-Katima Mulilo 220Kv, the 220 and 400 Kv power lines associated with the Kudu Gas Project, the Auas-Rehoboth 220Kv and the proposed Auas-Windhoek 400 Kv powerline projects.
Namibia	2004-05	NAMPOWER: Guide and review the Environmental Assessment for the proposed 800 MW gas fired power plant (known as Kudu Gas Project, Oranjemund)
South Africa	2004	South African Government: Special advisor to the Department of Environmental Affairs and Tourism on the validity of public appeals against the proposed Pebble Bed Modular (nuclear) Reactor, Cape Town, RSA
SADC	2005	Nexant (USA): Member of team that compiled the guidelines for hydroelectric schemes in southern Africa. The client was the Southern African Power Pool.
SADC	2006	Nexant (USA): Member of team that compiled the strategic plan for the Southern African Power Pool. The client was the Southern African Power Pool, funded by USAID.
Namibia and Angola	2009-14	NAMPOWER: Guide and review the Environmental Assessment for the proposed 800 MW Baynes hydropower scheme, Kunene river.
South Africa	2013	BKS: External review of the Houhoek power transmission station – Western Cape, South Africa.

Ground, surface and seawater development

<i>Country</i>	<i>Date:</i>	<i>Client, name of project and brief description</i>
Namibia	2001	Bicon Namibia: Write the Terms of Reference for the Tsumeb Groundwater Environmental Assessment, and then review the completed EA report.
Namibia	2003	NAMWATER: Guide and review the EIA for the proposed bulkwater abstraction of the Karst aquifer project
Namibia	2007/8	Trekkopie: Guide and review the EIA for the proposed Wlotkasbaken desalination project
Namibia	2008	NAMWATER: Guide and review the EIA for the proposed Mile 4 desalination project

Mining and petroleum

<i>Country</i>	<i>Date:</i>	<i>Client, name of project and brief description</i>
Namibia	2002	Shell Exploration: Assist with the preparation of Terms of Reference and assist with guiding the Environmental Assessment of the offshore Kudu Gas exploration project.
Namibia	2003	Rössing Uranium Ltd: Guide and review the Sustainability Assessment for the life extension of the Rössing Uranium mine
Mozambique	2003	Government of Mozambique (MICOA): Advise on the Strategic Environmental Assessment for mining and transport options in Gaza province
Namibia	2005	Government of Namibia: External review of the EIA report for the proposed new Langer Heinrich Uranium Mine, Namib Naukluft Park, Namibia
Namibia	2007-8	Trekkopie Uranium – Guide and review the EIA for the proposed Trekkopie Uranium Mine, western Namibia.
Namibia	2007-8	Valencia Uranium – Guide and review the EIA for the proposed Valencia Uranium Mine, western Namibia.

Namibia	2007-8	Rössing Uranium – Guide and review the EIA for the proposed Rössing Uranium extension Mine, western Namibia.
Namibia	2009	Gecko Chemicals: Guide and review various EIAs for the proposed mining and chemical production projects in western Namibia.
Mocambique	2010	SASOL: External review of gas exploration EIA and EMP for Sofalia Block prospect, Bazaruto area
Namibia	2012	Rössing Uranium – Guide and review the EIA for the proposed Rössing Uranium extension 2 Mine, western Namibia.

Risk Assessment

<i>Country</i>	<i>Date:</i>	<i>Client, name of project and brief description</i>
Namibia	2007	Namibia Airports Company: Assess risks of aircraft/wildlife strikes for 8 Namibian airports and co-author airport management plans for reducing wildlife strike risks.

Cleaner Production

<i>Country</i>	<i>Date:</i>	<i>Client, name of project and brief description</i>
Namibia	2005	DANIDA: Develop and present 3 training courses for SMEs in Namibia
Namibia	2006	DANIDA: Co-author 6 CP scoping and feasibility studies

Capacity building and facilitation:

<i>Country</i>	<i>Date:</i>	<i>Client, name of project and brief description</i>
South Africa	2001-5	University of Cape Town. Occasional external reviewer of MSc course in Environmental Management
SADC region	2002, 2005, 2008, 2009	IUCN: Supervise and mentor 20 African Professional Development Fellows in a “learning-by-doing” EIA skills enhancement programme, under the Capacity and Linkages in EIA in Africa (CLEIAA) initiative, funded by USAID, SIDA and World Bank. Initial 2 week training course followed by 3-month internships.
Namibia	2003 Short course	USAID: EIA training course for Namibian Community Based Tourism Association (NACOBTA)
Namibia	2003 Short course	USAID: Cleaner Production course for support organisations involved in Small and Medium Enterprise Development
Africa	2003	World Bank (Washington DC): Develop a Strategy for EIA Capacity Building in sub-Saharan Africa
Africa	2000-2005	Various: Facilitator for environmental conferences and workshops in Namibia, South Africa, Kenya, Morocco, USA and Mauritius using the ZOP method.
Swaziland	2004	Southern African Power Pool: Short course in EIA and public participation
Namibia	2005 and 2008	FAO and GTZ: EIA/SEA training for officials of the Okavango River Basin Commission (OKACOM), on the management and development of the Okavango River. Trainees were mid-level water resource managers from Angola, Namibia and Botswana.
Botswana	2005	European Union: Prepare, facilitate and co-present 2, week long courses on <i>Integrating HIV/AIDS issues in EA process relating to the Water Sector in Southern Africa.</i>
Africa	2001-present	Various: Facilitator of over 20 workshops, strategic planning sessions, and team and consensus building workshops for a variety of clients in the following countries: Namibia, South Africa, Morocco, USA, Kenya, Mauritius and Viet Nam.
Norway	2006	IAIA – Present short course on Public Participation in Impact Assessment. Part of the annual conference of the International Association for Impact Assessment.
Namibia	2007	GTZ – Co-develop and co-present short course on Strategic Environmental Assessment and Land Use Planning to Namibian government officials.
Namibia	2007	Namibian government – Co-develop and co-present 3 short courses on sustainable

		development tools to Namibian government officials.
Namibia	2007	UNOPS and World Bank – Develop and present a short course on sustainable development tools in the context of the management of the Namibian coast (for BCLME and NACOMA projects).
Nigeria	2007	World Bank – conduct training needs assessment for EA implementation in Nigeria and develop capacity building guidance.
Tanzania	2007	World Bank – conduct training needs assessment for EA implementation in Tanzania and develop capacity building guidance.
Nigeria	2007	World Bank – conduct 2-week training course for senior officials from Nigeria’s Fadama Project.
Tanzania	2008	World Bank – conduct 3 training courses to various target groups in various aspects of EA and development planning governance.
Ethiopia	2008	World Bank – conduct 1 short training course to decision makers in various aspects of EA and development planning governance, and run two workshops for various stakeholders on EA capacity building in Ethiopia.
Ethiopia	2008	World Bank – Facilitate and co-present a week-long training course on Strategic Environmental Assessment to participants from Ethiopia, DRC, Tanzania and Nigeria.
Ethiopia	2010	World Bank: Facilitate and present a 4-day training of trainers course on Environmental Assessment for the Water Sector to participants from the Ministry of Water and Energy, Ethiopia
Sierra Leone	2010	UNEP: Plan and deliver 4-day training course to SL Environment Agency on EA, and compliment theoretical training with in situ field visits to mines and other projects.
Mexico	2011	IAIA: Deliver course on EA Quality Control to participants attending the IAIA 11 conference in Puebla, Mexico
Ethiopia	2012	World Bank: Facilitate and present a 5-day training course on Strategic Environmental Assessment to the authorities (various ministries) responsible for planning and managing the Tana and Beles Sub Basins (tributaries of the Blue Nile). Included compiling guidance for the conducting of the two SEAs.
Portugal	2012	IAIA: Deliver course on EA Quality Control to participants attending the IAIA 12 conference in Oporto, Portugal
SADC	2012	UNDP: Deliver training of trainers course on use of EA in the combating of HIV and AIDS (linked to guidelines on this subject compiled by SAIEA) – course delivered in Johannesburg.
Tanzania	2013, 2014	NIRAS: SEA training course to participants of the Swedish EA training programme (participants from Asia, Africa and Europe). Course delivered in Arusha
Chile	2014	IAIA: Deliver course on EA Quality Control to participants attending the IAIA 14 conference in Vina el Mar, Chile.

Project appraisal and review

<i>Country</i>	<i>Date</i>	<i>Client, name of project and brief description</i>
Namibia	2003	GFA (Germany): Evaluation of Namibia’s North East Parks Project (project funded by KFW)
Namibia, Botswana and South Africa	2004	Government of Norway: Review of project proposal by the Desert Research Foundation of Namibia, to conduct a three year project on combating desertification using the FIRM approach in selected southern African countries

Publications and Seminars: (Selected list only)

Policy documents

1. Namibia’s Environmental Assessment Policy (Government of Namibia)
2. Policy for Park Management Plans (Government of Namibia)

Environmental Assessment and other technical reports

1. Preliminary Environmental Assessment of the proposed re-working of the Sarusas Amethyst mine, Skeleton Coast Park, Namibia (1999). Commissioned by the Ministry of Environment and Tourism, Republic of Namibia

2. Environmental Assessment of community-based tourism proposals in the Kwando Triangle, Caprivi (1999). Commissioned by the Ministry of Environment and Tourism, Republic of Namibia
3. Preliminary Environmental Assessment of the proposed Impalila Island "Peace Lodge" (2000). Commissioned by the Office of the President, Republic of Namibia
4. The environment and sustainable development in Africa: A contribution towards Africa 2025. Prepared for Africa's long term planning study (ALTPS), United Nations (African Futures), Abidjan, Côte d'Ivoire, August 2000.
5. Strategy for capacity building in Environmental Assessment and Management in Africa (May 2004). Prepared under the Auspices of the World Bank, in collaboration with EA networks in East, West, Central and Southern Africa.
6. Situation Assessment: Integration of biodiversity concerns in impact assessment in southern Africa. For the International Association for Impact Assessment (IAIA) – part of the global CBBIA project
7. Guideline: Integration of biodiversity concerns in impact assessment in southern Africa. For the International Association for Impact Assessment (IAIA) – part of the global CBBIA project
8. Guideline: Application of EA for the Nairobi Convention. For UNEP, Nairobi (2007)
9. Regional Report: Impact Assessment in the Western Indian Ocean Region. For UNEP, Nairobi (2007).
10. Strategic Environmental Assessment for the Mid-Zambezi Food Security Programme – for FAO/AfDB – 2006.
11. Strategic Environmental Assessment for Namibia's Millennium Challenge Corporation Rural Development Programme – for MCC, 2009.
12. Strategic Environmental Assessment for the Central Namib Uranium Rush – for MME, Government of Namibia, 2010.

Scientific Papers (selected list only)

1. **Tarr, P.W.** (1987): A southern elephant seal *Mirounga leonina* (Linn.) resident on the Skeleton Coast. Short Note. *Madoqua Vol.15 No 3, 1987 (265-266)*
2. **Tarr, P.W.** (1987): Non-nesting emergence by Green Turtles *Chelonia mydas* at the Cunene River Mouth, SWA/Namibia. Short Note. *Madoqua Vol.15 No 3, 1987 (265-266)*
3. **Tarr, P.W. and Tarr.J.G.** (1989): Veld dynamics and utilisation of vegetation by herbivores on the Ganias Flats, Skeleton Coast Park, SWA/Namibia. *Madoqua 1989, 16(1): 15-22*
4. **Lenssen J, Tarr.P, Berry.H** (1991): An assessment of visitor statistics and line fishing along the Sandwich shoreline, Namib-Naukluft Park, Namibia. *Madoqua 1991 18(1): 33-36*
5. Weaver, AvB, E. Chonguica, H, Rukato and **P.W. Tarr** (2003): NEPAD and Environmental Assessment. *African Journal of Environmental Assessment and Management, Volume 7, 1-13, November 2003*
6. **Tarr, P.W** (2007): Epupa case study. International Journal of Water Resources Development. Volume 23, number 3, September 2007 (pg 473-485). Third World Centre for Water Management, Mexico.

Research Discussion Papers

1. Blackie, R and **Tarr, P.W** (1998): Government policies on sustainable development in Namibia. Research Discussion Paper number 28, Directorate of Environmental Affairs, Ministry of Environment and Tourism, Namibia
2. **Tarr, P.W** (2000): Knowledge, opinions and attitudes regarding Environmental Assessment in Namibia: Results of a national survey conducted in 1997. Research Discussion Paper number 30, Directorate of Environmental Affairs, Ministry of Environment and Tourism, Namibia
3. **Tarr, P.W** and Figueira M (2000): Namibia's Environmental Assessment framework: - The evolution of policy and practice. Research Discussion Paper number 34, Directorate of Environmental Affairs, Ministry of Environment and Tourism, Namibia
4. Weaver, AvB, E. Chonguica, H, Rukato and **P.W. Tarr** (2003): The role of Environmental Assessment and Management in implementing NEPAD programmes: a discussion paper

Popular Articles and chapters in books

1. **Tarr, P.W** (1993): Conservation and mining – can they co-exist? *Namibia Brief 17: 80-84*
2. **Tarr, P.W** (1994): The Namib Coast – a destination with a difference. *Namibia Brief 19: 95-97*
3. **Tarr, P.W** (1994): Conserving endangered species. *Namibia Brief 19: 64-67*

4. **Tarr, P.W** (1996): International Treaties. *Namibia Brief 19: 159-163*
5. **Tarr, P.W** (1996): Namibia's Environmental Assessment Policy. *Namibia Environment 1: 135-138*
6. **Tarr, P.W** (1996): Environmental NGOs in Namibia. *Namibia Environment 1: 207-208*
7. **Tarr, P.W and J.G.Tarr** (2003): Southern Africa: An overview of the Environment. In: *Environmental Impact Assessment in southern Africa*. Southern African Institute for Environmental Assessment, Windhoek, Namibia
8. **Tarr, P.W and J.G.Tarr** (2003): Namibia chapter. In: *Environmental Impact Assessment in southern Africa*. Southern African Institute for Environmental Assessment, Windhoek, Namibia
9. Weaver, AvB, Keatimilwe, K and **Tarr, P.W** (2002): Environmental Impact Assessment in Southern Africa. In IEMA & EIA Centre. Environmental Assessment Yearbook 2002. Lincoln: IEMA&EIA Centre, Manchester University, UK
10. **Tarr, P.W** (2003): Human impacts on the marine environment. In Namibia's Marine Environment – State of Environment Report, Directorate of Environmental Affairs, Ministry of Environment and Tourism, Windhoek, Namibia (pg 71-100).

Conference Papers

1. **Glazewski.J and Tarr, P.W** (1996): Environmental Assessment in Namibia: An overview and update. Paper presented at the 1996 Annual Ministry Meeting.
2. **Tarr, P.W** (1998): Environmental Assessment in Southern Africa: - Is there a need for a Regional Approach? Paper presented at the GLOBE Environmental Conference, Parliament, Cape Town, South Africa.

Proceedings Documents

1. **Tarr, P.W** (ed.) (1993): Proceedings of the 1993 Ministry of Wildlife, Conservation and Tourism Annual Meeting (344 pages)
2. **Tarr, P.W** (ed.) (1995): Proceedings of the 1995 Ministry of Environment and Tourism Annual Meeting (253 pages)

Books

1. **Tarr, P.W** (ed) (1996): Namibia Environment vol.1 (208 pages)
2. **Tarr, P.W** (ed) (2003): Environmental Impact Assessment in southern Africa (337 pages)

Thesis

Tarr, P.W. (1998): The potential role of environmental assessment in promoting sustainable development in Namibia. PhD thesis. University of Aberdeen, Scotland. August 1999 (269 pages).

References:

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chrisbrown@nnf.org

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Stellenbosch, 7599 South Africa.
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Fax 0027 21 888 2696
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Dr Adriana Bianchi

World Bank
1818 H Street North West
Washington DC 20433, USA
rbianchi@worldbank.org

Certification:

I, the undersigned, certify that to the best of my knowledge and belief, this bio-data correctly describes myself, my qualifications, and my experience.

Date: 23 September 2015

Catherine Anne Brown (Cate)

Parent Company : Southern Waters Ecological Research and Consulting cc and Pty (Ltd.)

Address : Southern Waters Tel: 021-465-3235
PO Box 12414 Fax: 021-465-3901
Mill Street
Cape Town, 8010 Email: cbrown@southernwaters.co.za

Profession : Freshwater Ecologist

Experience : 20 years (16 years with parent company).

Professional qualifications:

South African Institute of Ecologists and Environmental Scientists: Professional member
International Association for Impact Assessment (South Africa): Professional member.

Education:

1986 B.Sc. (Zoology and Biochemistry)
University of Natal, Pietermaritzburg
1987 B.Sc. Hons. (Zoology)
University of Natal, Pietermaritzburg
1989 M.Sc. Avifauna communities in bush-pockets on the Alexandria Dunefield
University of Port Elizabeth
1998 PhD. Modelling and managing the effects of trout farms on Cape rivers
University of Cape Town.

Year of birth : 1964

Nationality : South African and British.

Languages: : English (excellent), Afrikaans (good).

Specialisations : Specialist knowledge in all aspects of flow requirements for rivers and in measures to mitigate the impact of water resource developments on rivers; experience in project design and management; specialist in situation assessments of rivers, experience in all forms of biomonitoring.

Countries of Work Experience: South Africa, Angola, Botswana, Cambodia, Laos, Lesotho, Mozambique, Namibia, Sudan, Tanzania, Zimbabwe.

Background

Cate has been working in the field of freshwater ecology since 1991. In 1994, she co-founded Southern Waters ER&C, and has been the managing partner since inception. She is author of 20 publications in the international scientific literature, and of more than 220 contract reports for Clients. She has contributed to chapters in four books, and has edited one book.

RELEVANT EXPERIENCE

January 1995 - present

SOUTHERN WATERS ECOLOGICAL RESEARCH AND CONSULTING cc.
Director and Consultant:

Examples of the sorts of projects undertaken over the years include:

Neelum River Kashmir/Pakistan

Client: NESPAK, Pakistan

Environmental Flow Task Leader: Assessment of the possible impacts on the Neelum River, Kashmir as a result of construction of Kishenganga Dam.

(2010-2013, 6 months)

Environmental Flow DSS Software

South Africa

Client: *Water Research Commission*

Project Leader: Development of Decision Support System (DSS) software to automate the process for Environmental Flow Assessments. The software is different from current DSSs in the field in that it fully incorporates the ecological, social and socio-economic aspects of management options to the same level of detail and sensitivity as the economic and engineering aspects. The DSS is based on advances made in the DRIFT methodology through its application in Southern and East Africa.

(2009 – 2013, 48 months)

Riversdale Coal Dredging of the Zambezi River ESIA

Mozambique

Client: ERM: *Riversdale Coal, Australia*

Environmental Flow Task Leader: Assessment of the possible impacts on the lower Zambezi River, and in particular the Zambezi Delta as a result of proposed dredging operation.

(2009-2010, 12 months)

Baynes Hydropower Environmental and Social Impact Assessment (ESIA) Namibia/Angola

Client: ERM: *Angola and Namibia Governments, through the Permanent Joint Technical Commission*

Environmental Flow Task Leader: Ecological Flow determinations using DRIFT for two sites on the Cunene River in northern Namibia. The EFs will form an integral part of the ESIA for the proposed hydropower stations at Baynes Gorge.

(2009 – 2010, 12 months)

Environmental and Social Impact Assessment (ESIA) Study for Sabaloka Hydropower Project, Mograt Hydropower Project and the Dagash Hydropower Project

Sudan

Client: *SMEC/Sudanese DIU*

Environmental Flow Task Leader: Ecological Flow determinations using DRIFT for three sites on the Nile River in central Sudan. The EFs form an integral part of the ESIA for the proposed hydropower stations at Sabaloka, Dagash and Mograt.

(2008 – 2009, 3 months)

Okavango Technical Diagnostic Analysis/EF component

Botswana, Namibia, Angola

Client: *Food and Agriculture Organization of the United Nations*

Integrated Flow Specialist: The objectives of the Okavango Technical Diagnostic Analysis/EF component are to collate biophysical and social information for the basin into a integrated flow assessment tool, which will allow for the generation of future scenarios of water use and the implications for the rivers, delta and local people for use in water-related decision-making.

(2008 – 2009, 12 months)

Pangani River Basin

Tanzania

Client: *IUCN*

The objectives of the Pangani Basin Baseline Flow Assessment (FA) Study are to generate baseline data of the condition of the Pangani River system against which the impact of water-related decision-making can be monitored in future; enhance the understanding of the relationship between flow, the river and people among PBWO and MWLD staff; create an awareness of the links between flow and the trade-offs that need to be made in water allocation; develop simple tools to help guide flow management and water allocations in the Pangani Basin; build capacity that will enable PWBO to act as a nucleus of expertise for FA-related work in other areas; support the National Water Policy (NAWAPO_2002) and the National Environmental Management Act (2004).

(2005-2008, 3 months).

LHWP: IFR Monitoring Programme**Lesotho***Client: Lesotho Highlands Development Authority*

Project Director:

The objectives of Contract LHDA 1237 are (from RFP) to ensure that LHDA's biophysical monitoring programme is running smoothly, in that LHDA possesses the in-house capacity (i.e., in terms of data collection and analysis) to carry out all the tasks associated with IFR monitoring; data collection and analytical tasks are meeting the goals and objectives set out in the IFR Policy and Procedures and are providing information to: determine if the desired river conditions set out in the IFR Policy are being achieved; and if not; to enable decisions to be made on appropriate action to be taken.

(2005-2006, 3.3 months).

Western Cape Reconciliation Study**Western Cape, South Africa***Client:: City of Cape Town/DWAF*

Ecological task leader: A comprehensive study of the water resources supplying the Greater Cape Town Metropolitan Area.

(2005-ongoing, 1.5 months).

Zambezi Delta Environmental Flow Assessment**Mozambique***Client:: Saving Cranes Foundation*

EF Facilitator and process designer: DRIFT EF process for the Zambezi Delta involving interest groups instead of biophysical specialists with the main aim of assessing the implications of various release options from Cahorra Bassa Dam.

(2005-present; 1 month).

Olifants/Doring River Reserve Determination**Western Cape, South Africa***Client: Department of Water Affairs and Forestry: RDM*

Project leader: This study objective is to recommend a comprehensive Ecological Water Requirement (EWR), for water quality and quantity, for various reaches of the Olifants and Doring Rivers, two key tributaries, and the Olifants River estuary. The study also reviews the importance of groundwater to current and potential users in the catchment, and a Terms of Reference for an appropriate level Groundwater EWR study will be prepared

(2003-present; 4 months).

DRIFT Users Manual and Associated Software**South Africa***Client:: Water Research Commission*

Author: Detailed manual for the biophysical components of the DRIFT method, including user-guides to the DRIFT database and DRIFT Hydrological software.

(2003-2005, 2 months).

Lower Orange River Management Study**South Africa/Namibia***Client:: DWAF and Namibian DWA.*

EF Team Leader and Advisor: An assessment of the relationship between the current flow regime in the river and the EFR recommended by the Desktop Model was examined, and that where appropriate changes be made to the recommended flows. The results of these analyses were incorporated into the systems modelling for planning purposes. Thereafter a ToR for a Comprehensive (reactive) EF assessment for the Orange River and its estuary was compiled.

(2002-2005, 2 months).

Operating rules for EF releases from LHWP structures**Lesotho***Client:: LHDA*

EF Advisor for issues and problems related to the implementation of the IFR releases stipulated in the IFR Policy for the Lesotho Highlands Water Project, Phase 1 a and b.

(2002-2005, 1 month).

Breede River Reserve Determination**Western Cape, South Africa***Client: Department of Water Affairs and Forestry: Project Planning*

EF Team Leader and specialist: Determination of the water quantity component of the Ecological Reserve for the main rivers within the Breede River Basin as part of the wider Breede River Basin Study (BRBS).

(1999-2002; 3 months).

Skuifraam Dam – Sizing of the outlet structures

Western Cape, South Africa

Client: Department of Water Affairs and Forestry; Ninham Shand Consulting Engineers

Specialist input into the design of the outlet structure in Skuifraam Dam on the Berg River, Western Cape, to facilitate the release of the channel maintenance floods requested as part of the IFR for the Berg River.

(July 1998, 0.5 months).

Lesotho Highland Water Project: IFR Assessments for all phases

Lesotho

Client: Lesotho Highlands Development Authority

IFR Process Co-ordinator, Habitat Integrity Specialist and Group Leader: Determination of the Instream Flow Requirements of the Senqu, Matsoku and Malibamatso and Senqunyane Rivers, as part of the Feasibility studies for all four phases of the proposed Lesotho Highlands Water Project: Co-leader of all pre-project activities including project design, production of the project proposal and negotiations with the client. Responsibilities include: co-ordination of an IFR Team of international scientists, co-ordination of all IFR activities, Habitat Integrity Assessment of the Senqu, Matsoku and Malibamatso and Senqunyane Rivers within the study area, report writing and compilation of all major reports.

(October 1997 - December 1999, 7 months).

Palmiet River IFR Assessment

Western Cape, South Africa

Client: DWAF Project Planning

IFR Task Leader, Habitat Integrity Specialist and Group Leader: Determination of the Instream Flow Requirements of the Palmiet River, Western Cape as part of the Feasibility studies for the proposed Palmiet Phase 1 development. Responsibilities include: co-ordination of all IFR activities, Habitat Integrity Assessment of the Palmiet River within the study area

(August 1997 - November 1998, 3 months).

Wit River IFR Assessment

Western Cape, South Africa

Client: Paarl Municipality

IFR Task Leader, Habitat Integrity Specialist and Group Leader: Determination of the Instream Flow Requirements of the Wit River, Bains Kloof, as part of the Feasibility studies for the proposed Wit River Dam. Responsibilities include: project design, proposal production, co-ordination of IFR Team and all IFR activities, Habitat Integrity Assessment of the Wit and Breede Rivers within the study area, liaison with Interested and Affected Parties. The project was terminated in March 1998, following protest against the dam.

(January 1997 - September 1997, 2 months).

Western Cape System Analysis: Ranking options

Western Cape, South Africa

Client: Department of Water Affairs and Forestry

Project Leader: A project conducted in close liaison with Interested and Affected Parties to assess the water resource developments proposed in the Western Cape System Analysis in terms of the following: the conservation status (habitat integrity), relative rehabilitation potential and relative ecological importance, within a regional context, of the rivers on which they are situated; the potential impacts of inundation on vegetation and fish; the viability of the projected yields of each scheme, from an environmental perspective and with respect to the needs of the downstream riverine ecosystems, taking into account their relative ecological importance.

(October 1996 - December 1996, 1 months).

Berg River IFR Refinement

Western Cape, South Africa

Client: Department of Water Affairs and Forestry

Compiler and Specialist Input: Responsibilities included: attendance at the workshop and production of the proceedings, liaison with the specialists.

(February - March 1996, 1 month).

Certification:

I, the undersigned, certify that to the best of my knowledge and belief, this bio-data correctly describes myself, my qualifications, and my experience.

A handwritten signature in black ink, consisting of a stylized, cursive script that is difficult to decipher. The signature is written over a horizontal line.

Date: 23 September 2015

Name: Peta-Jane SPONG
Nationality: Zimbabwe
Year of Birth: 1972
Profession: Environmental Management & Sustainability Consultant

Contact Details: Sustainability Solutions
Alexandra Park, Harare, Zimbabwe
Tel/Fax: +263 (04) 744 061
Mobile: +263 (0)774 509 689
Email: peta-jane@sustainability.co.zw

Key Qualifications:

Peta-Jane is an environmental and sustainability consultant with over 20 years working experience. She has worked on a broad range of projects in the mining, manufacturing, energy, water resources, waste management, tourism, agriculture and service provision sectors.

Areas of experience include the following:

- inclusive business and sustainable business projects.
- environmental and socio-economic impact assessments and environmental management plans.
- preparation of national environmental policies and guidelines.
- sector-specific environmental and social policies and guidelines.
- legal and regulatory compliance assessments.
- environmental auditing and due diligence.
- corporate environmental and social policy and environmental management systems.
- environment-oriented cost management in the manufacturing sector.

Peta-Jane has been involved in numerous environmental impact assessments (EIAs) and in the preparation of environmental management plans (EMPs) according to both national and international standards. She is therefore very familiar with the EIA/ EMP process and international donor requirements (*e.g.*, World Bank/ International Finance Corporation).

She was responsible for the preparation and review of sector-specific EIA guidelines at national level for Zimbabwe, Malawi and South Africa. The guidelines focused on the roads, mining, irrigation, waste management, sanitation and power sectors. The sector guidelines serve to compliment the overall environmental management procedures in these countries.

Peta-Jane has assisted several companies with the preparation and subsequent implementation of corporate environmental policies and environmental management systems (EMS) for their operations, all according to international standards. She is formally trained in ISO 14001 preparation and implementation.

In addition, she has undertaken various environmental audits focussing on organisations environmental management systems, including their environmental & social risks, compliance with local laws and compliance with international standards or industry best practices. She is therefore very familiar with the legal and regulatory framework pertaining to Zimbabwe.

She has also been involved in several audits of the NOSA SHE Integrated Five Star System where she focussed on the environmental component of the SHE system.

Peta-Jane has primarily worked in developing countries with particular experience in Africa. Clients have included SNV, IFC; World Bank; DfID; Danida; SAIEA; Government agencies of Zimbabwe, Malawi, Mozambique and South Africa; and the private sector (including Business Council for

Sustainable Development Zimbabwe, Raintree Mining, PanAfrican Mining, Zimasco, Anglo American, Rio Tinto Zimbabwe, Triangle Sugar Estates, Kiwi Brands/ SaraLee, Olivine, Merspin/ Glowave).

Peta-Jane currently consults for **Business Council for Sustainable Development Zimbabwe (BCSDZ), Inclusive Business Forum of Zimbabwe, Black Crystal Environmental Consultants, PricewaterhouseCoopers, Khokela Consult**, and for **Environmental Resources Management (ERM)**.

Previously she has also consulted for **Frontier Consulting Services** in Zimbabwe, **WSP Walmsley Environmental Consultants** (Zimbabwe/ South Africa) and **Synergistics Environmental Services** (South Africa).

Education:

- | | |
|------|--|
| 2015 | Climate Change and Business Course (Mainstreaming Climate Change in Development Planning and Implementation - Climate Change Virtual School, Harare, Zimbabwe). |
| 2011 | Sustainability Reporting Training Course (GRI Approved Reports) by Environmental & Sustainability Solutions CC, South Africa. |
| 2000 | Environment-oriented Cost Management (EoCM) Programme Training (EoCM Programme Consultants/ P3U/ GTZ/ Confederation of Zimbabwe Industries). |
| 1994 | ISO 14001 Environmental Auditor Training Course (Aspects International Ltd UK, accredited by Environmental Auditors Registration Association, EARA - UK). Certified Auditor. |
| 1993 | Bachelor of Science (BSc) Honours - Environmental Water Management (Rhodes University, Grahamstown, South Africa). Focus on Environmental Management. |
| 1992 | Bachelor of Science (BSc) - Zoology and Geography (Rhodes University, Grahamstown, South Africa). |

Employment Record:

- | | |
|---------------------------|--|
| November 2010 - present | <i>Environmental & Sustainability Consultant (Director).</i>
Sustainability Solutions Zimbabwe. |
| | <i>Independent Sustainability Consultant on behalf of:</i> |
| | - Business Council for Sustainable Development Zimbabwe (BCSDZ), Inclusive Business Forum of Zimbabwe & SNV. |
| | - Environmental Resources Management (ERM). |
| | - PricewaterhouseCoopers. |
| | - Khokhela Consult. |
| | - Black Crystal Environmental Consultants. |
| | - GCS Water & Environmental Consultants. |
| May 2006 - October 2010 | Maternity/ Family leave. |
| January 2002 - April 2006 | Director: Frontier Consulting Services/ Decision Frontier , Harare.
Responsible for Environmental Management services. |
| | Independent Environmental Management Consultant to the following: |

	<ul style="list-style-type: none"> - PricewaterhouseCoopers (PwC), Zimbabwe. - WSP Walmsley Environmental Consultants, Zimbabwe and South Africa. - Synergistics Environmental Services, South Africa. - Q Partnership Zimbabwe. - NOSA South Africa.
March 2001 - January 2002	Manager, Environmental Services, PricewaterhouseCoopers (PwC), Zimbabwe.
September 1999 - Feb 2001	Senior Consultant, Environmental Services, PricewaterhouseCoopers (PwC), Zimbabwe.
June 1997 - July 1999	Consultant, Environmental Resources Management (ERM) UK (Environmental Policy and Sustainable Development Team; Environmental and Social Assessment Unit - London).
April 1994 - May 1997	Assistant Consultant and Consultant: Wildlife, Tourism and Environmental Unit, Price Waterhouse (PW), Zimbabwe.

Experience Record:

1 Sustainable Business:

Zimbabwe: Advisory Services - Inclusive Business Forum of Zimbabwe, 2012-ongoing. For BCSDZ/ SNV and IB Forum of Zimbabwe. Peta-Jane is a Consultant with the Inclusive Business Forum of Zimbabwe which was established in April 2012 through SNV Netherlands Development Organisation and the Business Council for Sustainable Development Zimbabwe (BCSDZ). The Forum aims to promote Inclusive Business/ Enterprise Development policies, strategies, knowledge and implementation of projects within Zimbabwe. Inclusive Business (IB) involves corporate businesses doing business with low-income populations anywhere within a company's value chain, incorporating them in the supply, production, distribution and/or marketing of goods and services. This generates new jobs, incomes, technical skills and local capacity. Likewise, poorer consumers can benefit from products and services that meet their needs in affordable and appropriate ways. By focusing on commercial viability, these models have demonstrated inherent capacity to be scaled to engage thousands, and increasingly millions, of poor people.

Peta-Jane's role is to assist SNV/ BCSDZ with the ongoing development of IB in Zimbabwe. She is currently developing IB Pilot Project Evaluation tools and an Action Plan to increase project implementation within the business sector. She also assists with engaging companies with potential IB projects by providing guidance on IB implementation. In addition, Peta-Jane is responsible for the development of a case studies database and management of the IB Forum website.

Kenya: Environmental & Social Footprint Guidance for the Kenyan Banking Association (KBA), 2015-ongoing. For Khokhela Consult/ Confidential Client. Peta-Jane is part of the team developing an e-learning programme on sustainable finance for KBA members. The programme provides guidance to financial institutions on how to analyse, measure, monitor and manage their E&S risks. Peta-Jane is responsible for preparing the module which addresses the Operational E&S footprint within the sector.

Zimbabwe: Environment and Social Initiatives - Advisory Services to PricewaterhouseCoopers and a leading power company based in Zimbabwe, 2013-2014. For PwC/ Confidential Client. The overall assignment focuses on providing management advisory services to review the Company's

project strategy, operations, and structures including facilitating culture change within the organisation. Peta-Jane provided guidance to PwC on the environmental and social components of the assignment.

Zimbabwe: Environment and Social Risk Management Project - Advisory Services to a Financial Institution based in Zimbabwe, 2012. For Confidential Client. Peta-Jane was involved with the environmental and social risk management project for a large Zimbabwe Bank. She is assisted with the development of environmental, social and governance (ESG) guidelines for their lending activities. These guidelines are based on Zimbabwe legislation, IFC standards and international best practice. The guidelines also consider sector-specific risks and opportunities.

Zimbabwe: Business Council of Sustainable Development Zimbabwe (BCSDZ) Waste Management Group, 2011-ongoing. Peta-Jane is a member of the BCSDZ Waste Management Group which is responsible for assisting the industrial sector with waste management issues.

2 Climate Change/ Carbon Management:

Zimbabwe: Carbon Footprint Services for a major Mobile Services Provider, 2014-2015. For Confidential Client. Environmental Management Resources (ERM) South Africa has been awarded the contract to undertake the carbon-footprint project for a mobile service provider based in Zimbabwe. Peta-Jane is the local project co-ordinator on the team.

Zimbabwe/ Mozambique: Mozambique Regional Gateway Programme (MRGP) - Strategic Environmental Assessment and Climate Change Resilience Guidelines, 2012. For COMESA/ DFID. The MRGP is a five-year programme which aims to support the improvement of the Southern African transport, energy, and information and communication technology infrastructure network, which uses Mozambique as a gateway for international trade. The MRGP encompasses the Beira and Nacala Transport Corridors along with the respective links to the Maputo and Limpopo Corridors, including sections of the corridors situated in the neighbouring countries of Malawi, Zimbabwe, Zambia and Botswana. Environmental Resources Management (ERM) have been tasked with undertaking a *Strategic Environment Assessment (SEA)* for the project and development of *Climate Change Resilience Guidelines*. Peta-Jane is assisting ERM as a local consultant for the Zimbabwe component of the project.

Kenya: Project Evaluation of Tigo Power Limited , Mombasa, Kenya. For the ERM Foundation, Low-Carbon Enterprise Fund, 2011. Peta-Jane assisted with the evaluation of Tigo Power based in Mombasa as a potential beneficiary of ERM Foundation's Low Carbon Enterprise Fund. The fund offers financial and technical support for low-carbon ventures in developing countries. Tigo Power is a supplier of solar products such as solar lamps, solar generators, and solar systems for housing projects. Although the business is growing, ERM identified Tigo as a venture that may benefit from both technical and financial support in order to aid their expansion.

3 Environmental Impact Assessments (EIAs) and Environmental Management Plans (EMPs)

Zimbabwe: SEIA of the Batoka Gorge HES Project, 2014-ongoing. For Zambezi River Authority and World Bank. Environmental Management Resources (ERM) together with local partners Black Crystal Consulting, was awarded the contract to undertake the Social and Environmental Impact Assessment for the Batoka Gorge hydro-electric scheme project on the Zambezi River. Peta-Jane is the local project co-ordinator on the Zimbabwe team.

Zimbabwe: Environmental Impact Assessment and Environmental Management Plan for Forrest Mining Exploration Project, Kadoma, Zimbabwe. For Raintree Mining (Pvt) Limited, 2011 - 2012.

On behalf of Raintree Mining (Pvt) Limited, Peta-Jane assisted with the preparation of the EIA and EMP for a gold mining exploration project located within the Forrest Claims near Kadoma. The EIA was prepared in accordance to the Zimbabwe legal requirements.

Zimbabwe: Environmental Impact Assessment – Revised Detailed Prospectus and Environmental Management Plan for Muriel Mine Re-Treatment Project. For Pan African Mining (Pvt) Limited, 2011 - ongoing. Pan African Mining is in the process of reviewing their Muriel Mine tailing re-treatment project which has been on hold for the past few years. Following Peta-Jane's preparation of the EIA/ Detailed Prospectus for the project in 2005, she is assisting Pan African Mining with the preparation of a revised report.

Zimbabwe: Environmental Impact Assessment - Detailed Prospectus and Environmental Management Plan for Muriel Mine Re-Treatment Project. For Pan African Mining (Pvt) Limited, 2004-2005. On behalf of Pan-African Mining, Peta-Jane prepared a Detailed Prospectus and EMP for the Muriel Mine Re-treatment Project near Banket, Zimbabwe. The Detailed Prospectus represents the first phase of the EIA process in Zimbabwe and was submitted to the Department of Natural Resources for review and approval. The project involves re-treatment of old gold tailings dam material and subsequent re-opening of the gold mine. The Prospectus follows the requirements stipulated in the Environmental Management Act of 2002 along with the EIA Policy and Guidelines for Zimbabwe.

Zimbabwe: Addendum to the Environmental Impact Assessment and Environmental Management Plan for Unki Platinum Mine, Shurugwi, Zimbabwe. For Unki Mine (Pvt) Limited/ Anglo American Zimbabwe, 2005. On behalf of Q Partnership, Peta-Jane assisted with the preparation of an Addendum to the original EIA prepared for the Unki Platinum Mine. The original EIA and EMP were undertaken in 2002. Subsequent to this 2002 report, the project has undergone some design changes and the potential environmental and socio-economic implications of these changes needed to be addressed by an Addendum. Key issues included siting of the tailings dam facility, options for the water pipeline route, and modifications to labour requirements. As part of the project, Peta-Jane assisted with site visits, consultations with stakeholders and interested parties, specialist discussions and report preparation.

Zimbabwe: Environmental Impact Assessment and Environmental Management Plans for Five Black Granite Quarries. For Confidential Client, 2003 - 2004. On behalf of the Q Partnership, Peta-Jane assisted with undertaking EIAs and preparing EMPs for five current black granite extraction operations in the Mutoko, Murehwa and Mount Darwin areas of Zimbabwe. The key issues relate to management of the waste rock and rehabilitation of the sites. Peta-Jane is one of the EIA specialists on the team. The EIA and EMP were undertaken and prepared according to Zimbabwe's legislation and guidelines.

Zimbabwe: Environmental Impact Assessment – Detailed Prospectus for Proposed Landfill site on Triangle Limited's Estate. For Triangle Limited, 2004. On behalf of Q Partnership, Peta-Jane assisted with the preparation of the Detailed Prospectus for the proposed project. The Detailed Prospectus was submitted to the Department of Natural Resources for review as per the EIA process in Zimbabwe. As part of the assignment, Peta-Jane undertook site visits, consultations with Triangle community, and consultations with specialists. The Prospectus follows the requirements stipulated in the Environmental Management Act of 2002 along with the EIA Policy and Guidelines for Zimbabwe.

Lesotho: Environmental Impact Assessment and Environmental Management Plan for Six Towns Water Supply Project, Lowlands of Lesotho. For Consulting Engineers Salzgitter/ Lesotho's Water and Sewage Authority/ EU, 2003 - ongoing. On behalf of WSP Walmsley Environmental Consultants, Peta-Jane is the EIA specialist on the team proposing to rehabilitate and refurbish the urban water supply and sanitation systems of Mapoteng, Maputsoe, Teyateyaneng, Morija, Roma, and Quthing in the lowlands of Lesotho. The EIA is to be undertaken according to the Lesotho legislation

and guidelines. As the project focuses largely on improvement of existing systems, the assessment concentrates on providing practical and cost-effective environmental management recommendations.

South Africa: Environmental Management Plan for the Proposed Gautrain Project. For Gaudiwe Consortium, 2003. On behalf of WSP Walmsley Environmental Consultants, Peta-Jane assisted with the preparation of the Bid Documents for the Gautrain Project Tender. WSPW were part of a consortium that submitted a bid to undertake the development of the underground rail transport system within the Gauteng Province of South Africa. The project proposes to provide extensive rail transport between the main centres in Johannesburg and Pretoria, and Johannesburg International Airport. Peta-Jane assisted with the review of past EIA, EMP and specialist reports and with the overall preparation of the environmental management plan proposal according to specific requirements for the bid documents.

South Africa: Development of Sector-specific Environmental Impact Assessment Guidelines for the Road and Electricity Supply sectors. For Department of Environmental Affairs and Tourism (DEAT), Government of South Africa, 2003. Peta-Jane was responsible for reviewing the draft EIA guideline documents on behalf of WSP Walmsley to ensure that they covered the keys issues for each sector and to ensure consistency between sectors.

Zimbabwe: Environmental Review and Environmental Management Plan for the Proposed Sencol Coal Mining Project. For Beta Bricks/ Rio Tinto Zimbabwe (Pvt) Ltd, 2003. On behalf of WSP Walmsley Environmental Consultants, Peta-Jane undertook a review of the proposed coal mining operations at the Sengwa Coal fields, Gokwe North and prepared the EMP. The client, Beta Bricks were looking for an alternative coal supply for their brick-making operations outside of Harare. Due to the economic situation, Wankie colliery was unable to supply Beta Bricks (among others) with adequate coal supplies. Riozim's Sencol mine has been closed since the early 1990's and Beta Bricks proposed re-opening the mine on a tribute basis. The project involved open cast mining with production estimates of 4,000 tons/month for six months. During the initial six months trials would be undertaken for increasing production to supply additional industries. Riozim required an EMP to be prepared prior to granting approval for Beta Bricks to commence operations.

Zimbabwe: Environmental Review and Environmental Management Plan for a leading cosmetics and household products manufacturer – Kiwi Brands Zimbabwe. For Kiwi Brands Zimbabwe/ Sara Lee Corporation, 2002-2003. In line with Sara Lee's international environmental policies, Kiwi Brands Zimbabwe commissioned WSP Walmsley to undertake an environmental review of their current manufacturing operations and recommend environmental mitigation, monitoring and management measures towards improving their environmental performance. The company manufactures skincare and household products for both the Zimbabwean market and for export within the region. Peta-Jane was responsible for undertaking the review and preparing the EMP. The review and recommendations focussed on the company's compliance with Zimbabwean legislation, Corporate Policies and internationally acceptable practices. Main issues of concern included the management of hazardous raw materials used in the manufacturing process along with issues of water quality control. Based on the review, recommendations for improvements were presented along with guidance on environmental management activities in general. Following implementation of the recommendations, Peta-Jane undertook an environmental audit of Kiwi Brands operations in June 2003.

Zambia: Report on Environmental Impact Assessment Practice in Zambia for the World Summit on Sustainable Development (WSSD). For Southern African Institute for Environmental Assessment (SAIEA)/ Danida, 2003. SAIEA were responsible for the preparation of a book on the use of EIA in the SADC region, as part of the WSSD initiatives. Key issues covered included an overview of the EIA process in each country and a discussion on how the process is implemented in practice, along with some EIA case studies. Key successes and challenges were also presented for each country. Peta-Jane was responsible for the review of the chapter for Zambia prepared by WSP Walmsley. The review ensured that key issues were addressed and that the content of the chapter was consistent with the books' requirements.

Malawi and Mozambique: Environmental Impact Assessment and Environmental Management Plan for the Nacala Corridor Project. For Governments of Malawi and Mozambique, 2002-2003.

The project involved the transport of goods using the existing Malawi and Mozambique railway network via the port of Nacala in Mozambique. In particular, fuel and fertilisers are imported into Mozambique and Malawi, and agricultural produce is exported. Minor upgrading and rehabilitation of the railway line and its facilities was required. The EIA was preliminary, as the project did not require a full EIA but rather an EMP. Peta-Jane was an environmental specialist on the WSP Walmsley team. She was responsible for consulting with the appropriate authorities in Malawi and Mozambique, undertaking extensive field investigations, and preparation of the EIA and EMP reports.

Nigeria: Independent Review of the Environmental Impact Assessment Report for the National Fadama Development Project (Phase 2). For Southern African Institute for Environmental Assessment (SAIEA)/ World Bank, 2002.

Peta-Jane undertook a detailed review of the EIA Report on behalf of SAIEA. The project forms part of an ongoing project to develop wetlands and floodplains in Nigeria for small-scale irrigation activities. The review was based on internationally acceptable criteria and covered issues such as the methodology used in the EIA; extent of public participation; description of the proposed project and project setting; analysis of alternatives; impact identification and evaluation; and the recommended mitigation and monitoring measures.

Malawi and Zimbabwe: Report on Environmental Impact Assessment Practice in Malawi and Zimbabwe for the World Summit on Sustainable Development (WSSD). For Southern African Institute for Environmental Assessment (SAIEA)/ Danida, 2002. SAIEA were responsible for the preparation of a book on the use of EIA in the SADC region. Key issues covered included an overview of the EIA process in each country and a discussion on how the process is implemented in practice, along with some EIA case studies. Key successes and challenges were also presented for each country. Peta-Jane was responsible for the preparation of the chapters for Malawi and Zimbabwe on behalf of WSP Walmsley.

Zimbabwe: Environmental Review of the Impact of Business Competency Training for Smallholder Cotton Farming in Gokwe and Muzarabani. For The LEAD Program, Development Alternatives Incorporated/ USAID, 2002. Although the LEAD project focuses on training activities, the impacts of the training on cotton farming activities needed to be assessed. Key environmental and socio-economic impacts were identified and practical mitigation measures recommended. The results of the Environmental Review were to be incorporated into the training activities. Peta-Jane was the Team Leader and Environmental Specialist on the WSP Walmsley team.

Malawi: Development of Sector Specific Environmental Impact Assessment Guidelines for the Mining, Irrigation, Waste Management and Sanitation Sectors in Malawi. For Government of Malawi, Environmental Affairs Department funded by the World Bank, 2000 - 2001. PwC were commissioned to prepare guidelines for conducting environmental impact assessments (EIAs) for the mining, irrigation, waste management and sanitation sectors in Malawi. These guidelines represent the first phase in the development of sector-specific guidelines for EIA for new projects and form part of the overall environmental management policies operating in Malawi. The guidelines have been developed based on the current legislative framework in Malawi, along with literature reviews of regional and international practices, site visits to existing operations, and extensive consultations with key stakeholders. Peta-Jane was the Project Manager and EIA Specialist on the team.

Zimbabwe: Development of Environmental Impact Assessment and Environmental Evaluation (EE) Guidelines for Smallholder Irrigation Projects in Zimbabwe. For Ministry of Lands, Agriculture and Rural Resettlement (MoLAR)/ Smallholder Irrigation Support Programme (SISP) funded by DANIDA, 2000 - 2001. The MoLAR in conjunction with SISP recognised the need for more sector specific EIA guidelines in Zimbabwe - in particular - for the smallholder irrigation sector. PwC were commissioned to develop these guidelines and provide guidance to the district teams that will be responsible for using the guidelines. The project primarily focused on the Screening and

Scoping phases of EIA, and involved a literature review, consultations with Government agencies (e.g., the Department of Natural Resources), field visits to existing schemes and training courses. In addition, the guidelines included guidance on undertaking environmental evaluations (similar to audits) of existing smallholder schemes in Zimbabwe. Other components included guidance on the preparation of initial environmental evaluation reports, environment management plans and public participation methodologies. Peta-Jane was the Project Manager and EIA Specialist on the team.

Zimbabwe: Environmental Review and Preparation of an Environmental Impact Assessment Prospectus for a Proposed Textile Manufacturing Operation based in Bulawayo. For Merspin/Gloweave (Pvt) Ltd, 1999 - 2000. The company had applied for Export Processing Zone (EPZ) status for the proposed development. The EPZ Authority requires an EIA to be conducted for the new development and hence commissioned PricewaterhouseCoopers to assist. Key issues included water consumption, wastewater management, dust emissions and handling of hazardous chemicals. The environmental review was conducted according to both Zimbabwean EIA Guidelines (and the pending Environmental Bill) and World Bank/ IFC guidelines. A prospectus was prepared as part of the initial EIA process. Extensive consultations were held with the Ministry of Mines, Environment and Tourism as well as with the EPZ Authority to ensure compliance with their requirements. Peta-Jane was the Team Leader and Project Manager for this assignment.

Côte d'Ivoire: Environmental Impact Assessment of a Proposed Combined Cycle Gas Turbine (CCGT) Power Plant in Abidjan, Côte d'Ivoire. For ABB Energy/IPS Consortium and the International Finance Corporation (IFC) 1997-99. Peta-Jane was Project Manager for this IFC Category A project. Environmental Resources Management (ERM) was commissioned to undertake an EIA of the construction and operation of a CCGT power plant near Azito village, Ebrie Lagoon and Parc du Banco in Abidjan. The full range of environmental impacts were evaluated, including a focus on the potential for air and water pollution. An extensive public consultation exercise was conducted as part of the EIA to ensure involvement from all stakeholders. In addition, a Phase 1 Contaminated Land Review was carried out for the power plant project site. As an addendum to this project, an EIA of the Azito-Abobo Transmission Line and Substation was conducted to IFC standards. The assessment looked at all potential social and environmental impacts of a proposed 16 km 225 kV transmission line and sub-station connecting the proposed CCGT power plant to the existing grid. Following on from the EIA, ERM assisted with the design and implementation of the EMMP with specific attention on the air and noise monitoring programmes.

Senegal: Environmental Mitigation, Monitoring and Management Plan for a Combined Cycle Gas Turbine (CCGT) Power Plant. For Greenwich Turbine Inc. (GE Capital) and the International Finance Corporation (IFC), 1997-99. Peta-Jane was Project Manager for this follow-on project to the Environmental Assessment (IFC Category B project) conducted by ERM earlier in 1997. The EMMP was designed to address the key issues related to increased atmospheric emissions from the proposed power plant (based on the extensive air quality modelling done in the EA) to ensure compliance with World Bank ambient air quality guidelines. Secondary issues included noise, discharge of effluents, water supply and contaminated land.

Mozambique: Environmental Impact Assessment for an Open-cast Tantalum Mine. For Tantalum Mining Corporation - Canada, 1996. Peta-Jane was project manager and consultant on the Price Waterhouse (PW) team that undertook an EIA for a proposed open-cast tantalum mine in Mozambique. The project included overall assessment of potential impacts, both environmental and socio-economic, along with recommended mitigation and monitoring measures. The mine's environmental mitigation, monitoring and management plan covers construction, operation and closure activities of the mine. Peta-Jane was responsible for conducting the scoping visit and co-ordinating specialist inputs to the EIA.

Zimbabwe: Environmental Impact Assessment of small-scale chrome mining and provision of recommendations on community-based natural resource management. For the Muzurabani Rural District Council (and associated Campfire programme). Funded by the Zambezi Society, 1996. Peta-Jane was project manager and consultant on the team that conducted an EIA of informal, small-scale

chrome mining activities within Mvuradonha Wilderness Area (a community-based eco-tourism initiative). The project involved the assessment of the environmental and socio-economic impacts of existing mining activities on the borders of the wilderness area and potential impacts of mining activities within the area, with particular focus on the impact of mining on the eco-tourism activities. The project included mapping of environmental baseline and project activities using a simple GIS. The report recommended land-use plans for the area based on the assessment of the natural resources and current eco-tourism activities in the area.

Zimbabwe: Environmental Impact Assessments and Environmental Management Plans for Patchway and Brompton Gold mines. For Rio Tinto Zimbabwe, 1995-1996. Peta-Jane assisted in conducting EIAs for two gold mines in Kadoma, Zimbabwe. The project included assessment of environmental pollution by the mining activities based on soil, water and waste rock sampling and analysis. Based on the impact assessment a mitigation, monitoring and management plan (EMP) was developed and subsequently formed part of the implementation plan developed by mine management. As part of the EIA, mine closure procedures were recommended along with associated socio-economic activities.

Tanzania: Environmental Impact Assessments of Six Tourism Facilities in the Selous Game Reserve. Funded by GTZ, 1995. Peta-Jane conducted EIAs of six tourist camps and associated activities within the Selous Game Reserve, Tanzania. These assessments form part of a tourism management plan being developed for the northern sector of the Reserve.

Zimbabwe: Manual for the Preparation of Environmental Impact Assessments for Road Construction Projects. For a confidential client on behalf of the Department of State Roads, Government of Zimbabwe, 1994-1995. Peta-Jane compiled a manual for the conduct of EIAs for road construction projects. The manual is for use by the Department of State Roads, when planning road construction projects. The report will also serve as the basis for EIAs conducted on other road projects within Zimbabwe.

Zimbabwe: Environmental Impact Assessment of Water Supply Project. For a confidential client, 1995. Peta-Jane was responsible for the compilation of baseline data a part of the EIA of Mhondoro "B" water supply project within the Mhondoro Communal Lands, central Zimbabwe. The project included the development of a medium-size dam and subsequent irrigation system to supply the surrounding agricultural community.

4 Environmental Policies and Guidelines, Environmental Management Systems, Management Plans, Environmental Auditing and Reporting

Zimbabwe: SHEQ system for a Quarry Operation outside Harare. For Confidential Client, 2011. Peta-Jane provided assistance with the identification, implementation and management appropriate Safety, Health and Environment software for a quarry mining operation near Harare. The Client is looking to implement SHE software in order to manage their SHE strategy.

Zimbabwe: Review of Environmental Action Plan of a leading cosmetics and household products manufacturer - Kiwi Brands Zimbabwe. For Kiwi Brands Zimbabwe/ Sara Lee Corporation, 2006. Following on from the Environmental Management Plan/ Environmental Audit (2003) and the Environmental Action Plan (2004), Kiwi Brands Zimbabwe commissioned Frontier Consulting Services to review their Environmental Action Plan. The Plan forms part of their Environmental Management strategy, primarily, addressing any areas of non-compliance and/ or issues that require continual improvement. It provides a detailed record of ongoing environmental activities and targets towards improving overall environmental performance. In addition, it provides Kiwi Brands with a user-friendly and practical document that can be updated internally on a monthly basis as activities are implemented/ monitored. The company manufactures skincare and household products for both the Zimbabwean market and for export within the region. Peta-Jane was responsible for undertaking the review, providing further recommendations, and updating the Action Plan. The review focussed on

the company's compliance with Corporate Policies, Zimbabwean legislation, and internationally acceptable practices.

Zimbabwe: Corporate Sustainability Policy for Triangle Limited's Estate. For Triangle Limited, 2005. Peta-Jane assisted with the preparation of a corporate Sustainability Policy for Triangle Limited, a large sugar cane estate and sugar mill based in the Lowveld of Zimbabwe. Peta-Jane was responsible for undertaking a comprehensive literature review and for the preparation of the First Draft Policy for circulation within the organisation. Triangle Limited would like to play a proactive role in environmental management of their activities and strive to continually improve their environmental performance. The company-wide Policy follows the National Environmental Policy and serves to provide guiding principles for sustainable development throughout Triangle Limited's operations.

Zimbabwe: NOSA Integrated Five Star System Audits of Zimbabwe Mining and Smelting Company's (Zimasco) KweKwe Smelter and Shurugwi Mine. For Zimasco Private Limited. 2004. On behalf of NOSA South Africa, Peta-Jane was part of the team that undertook the annual NOSA Five Star Integrated System audits of Zimasco's KweKwe Smelter and Shurugwi Mine operations. Peta-Jane was responsible for auditing the environmental component of the Safety, Health and Environment system. The audits covered the identification of hazards and risks; the development and implementation of appropriate systems, standards and procedures; the level of compliance with the system requirements; and the subsequent overall effectiveness of the system. The audit process was based on the NOSA Five Star Integrated System and the findings were discussed in terms of non-conformances and observations. Based on the findings, the Divisions were graded as appropriate.

Zimbabwe: NOSA Integrated Five Star System Audit of Mimosa Mining Company. For Zimasco/ Impala Mines, South Africa. 2004. On behalf of NOSA South Africa, Peta-Jane was part of the team that undertook the annual NOSA Five Star Integrated System audit of Mimosa Mine. Peta-Jane was responsible for auditing the environmental component of the Safety, Health and Environment system. The audits covered the identification of hazards and risks; the development and implementation of appropriate systems, standards and procedures; the level of compliance with the system requirements; and the subsequent overall effectiveness of the system. The audit process was based on the NOSA Five Star Integrated System and the findings were discussed in terms of non-conformances and observations. Based on the findings, the Mimosa Mine operations were graded accordingly.

Zimbabwe: Environmental Review and Environmental Action Plan for a leading cosmetics and household products manufacturer - Kiwi Brands Zimbabwe. For Kiwi Brands Zimbabwe/ Sara Lee Corporation, 2004. Following on from the Environmental Management Plan and Environmental Audit undertaken in 2003, Peta-Jane assisted Kiwi Brands with the development of an Environmental Action Plan. The Plan was based on a Progress Review undertaken in August 2004. Primarily, it focuses on addressing any areas of non-compliance and/ or issues that require continual improvement. It provides Kiwi Brands with a user-friendly and practical document that can be updated on a monthly basis as activities are implemented and as environmental performance improves.

Zimbabwe: Environmental Audit of a leading cosmetics and household products manufacturer - Kiwi Brands Zimbabwe. For Kiwi Brands Zimbabwe/ Sara Lee Corporation, 2003. Following on from the Environmental Review undertaken in 2002, Kiwi Brands Zimbabwe commissioned WSP Walmsley to undertake an environmental audit of their current manufacturing operations and recommend measures towards improving their environmental performance. The company manufactures skincare and household products for both the Zimbabwean market and for export within the region. Peta-Jane was responsible for undertaking the audit and preparing the audit report. The audit focussed on the company's compliance with Zimbabwean legislation, Corporate Policies and internationally acceptable practices.

Zimbabwe: IIED series of workshops on Globalisation, Business and Environment in developing countries. IIED. 2004. Peta-Jane participated as an environmental practitioner in a series of workshops aimed at corporate sector in Zimbabwe. The focus of the workshops was the use of

Discourse Analysis Tool and how it can be used effectively in analysis Globalisation, Business and Environmental trends along with environmental reporting.

Malawi: Development of Environmental Management System (EMS) Guidelines and Environmental Auditing Guidelines for the Mining, Irrigation, Waste Management and Sanitation Sectors in Malawi. For Government of Malawi, Environmental Affairs Department funded by the World Bank, 2001. PricewaterhouseCoopers (PwC) were commissioned to prepare guidelines for the preparation and implementation of environmental management systems and for undertaking environmental audits for the mining, irrigation, waste management and sanitation sectors in Malawi. These guidelines represent the second phase in the development of sector-specific guidelines and form part of the overall environmental management policies operating in Malawi. The guidelines follow on from the EIA Guidelines prepared in August 2001. As with Phase 1, they have been developed based on the current legislative framework in Malawi, along with literature reviews of regional and international practices, site visits to existing operations, and extensive consultations with key stakeholders. Peta-Jane was the project Manager and Environmental Management Specialist on the team.

Zimbabwe: Provision of Assistance with the Implementation of the Environment-oriented Cost Management (EoCM) Programme developed by GTZ/P3U at Olivine Industries (Pvt) Ltd. For Olivine Industries Pvt Ltd/ Confederation of Zimbabwe Industries/ GTZ, 2000-2001. Peta-Jane was the Environmental Management consultant on the team tasked with implementing EoCM at the Soap Manufacturing Plant of Olivine Industries. Implementation was phased over 9 months. Peta-Jane's key responsibilities included providing guidance on environmental management issues along with report writing, facilitation and moderation of meetings, and general back-stopping throughout the programme implementation.

Zimbabwe: Development of a Generic Resettlement and Compensation Methodology: Resettlement and Rehabilitation Action Plans (RRAPs), 1999. Peta-Jane assisted with the development of a generic PwC RRAP methodology for conducting resettlement and compensation activities as a result of new developments in Zimbabwe. It is based on both Zimbabwean regulations and internationally acceptable practices. The methodology was presented by Peta-Jane on behalf of PwC at the 1999 Institute of Mining and Metallurgy Conference entitled Mining and the Environment.

Newly Independent States (former Soviet Union): Development of Common Environment Policies for the Newly Independent States and Mongolia. For the European Commission (Tacis), 1997-1999. Peta-Jane assisted with the project management of this major 4 million ECU project to develop and implement national environmental action plans (NEAPs) in each of the NIS countries of the former Soviet Union. ERM were commissioned to undertake the project which ran for a two-year period. Peta-Jane assisted with the co-ordination and management of project activities which included the deployment of long-term NEAP advisors in each country, and arrangements for the provision of training seminars and workshops in priority areas such as project preparation, environmental legislation, public participation and the implementation of transboundary agreements.

Zimbabwe: Guidance on Company Environmental Policy Preparation and Environmental Reporting for a major food processing operation. For Industrial Food Processors - Delta Corporation Private Limited, 1997. On behalf of Price Waterhouse (PW), Peta-Jane was responsible for the preparation and compilation of an environmental report for a large food processing operation (primarily manufacture of starch, glucose and subsequent by-products) in Harare. The report is based on the restructuring of their environmental management system towards conforming to the ISO 14000 range of specifications and guidelines. In preparing the content of the report, the company's current EMS was reviewed through a series of workshops attended by senior management. The environmental report was published and presented to the stakeholders as part of the company's Group Annual Report.

Zimbabwe: Environmental Workshops on Environmental Management Systems. For Triangle Limited, 1996. Peta-Jane was project manager and facilitator on the PW team undertaking a series of

workshops for the senior management of manufacturing and service divisions within a large industrial conglomerate operating (largely involved in sugar cane farming and sugar refining) in the south-east of Zimbabwe. The objectives of the workshop were to establish major environmental issues and ongoing activities within each of the divisions, and thus develop more formal environmental management systems in line with ISO 14001 specifications. The companies main activities include: sugar cane farming, manufacturing of sugar and associated by-products (such a molasses, ethanol, cattle fodder), small-scale fisheries, cattle rearing (and associated abattoirs) and a cotton gin.

Zimbabwe: Review of Environmental Reporting Techniques and Methodology. For Delta Corporation Private Limited, 1997. Peta-Jane was responsible for the review of half-yearly environmental reports produced by divisions of a large industrial conglomerate operating throughout Zimbabwe. Peta-Jane evaluated these reports in relation to international standards and previous work conducted for the Group's environmental policies. In addition, the review assessed the quality of divisional environmental reports intended for inclusion in the annual Group Environmental Report. The Group's activities include extensive operations in food processing, beverage manufacture (*i.e.*, soft drinks, opaque beer and clear beer) furniture manufacture, retail, transport, and tourism sectors throughout Zimbabwe.

Zimbabwe: Environmental Review and Environmental Management System for a Screen Printing Operation. For Design Incorporated and Deadly Dezigns, 1996. Peta-Jane assisted a textile screen printing company and affiliated stationery printing company with an environmental review of their operations and with the subsequent design of an environmental management system for ongoing improvement. The project included the identification of major environmental impacts along with recommendations on mitigation and monitoring measures.

Zimbabwe: Preparation of Company Wide Environmental Report. For Delta Corporation Private Limited, 1996. Peta-Jane assisted Delta Corporation with the compilation of an Environmental Report on the Group's activities. Activities include extensive operations in food processing, beverage manufacture (*i.e.*, soft drinks, opaque beer and clear beer) furniture manufacture, retail, transport, and tourism sectors throughout Zimbabwe. The Environmental Report was published alongside the Group's Financial Report at year-end and initiated the ongoing development of a formal environmental management system for the Group.

Zimbabwe: Environmental Legislation and Policies in Zimbabwe Seminar. For Rio Tinto Zimbabwe, 1995. Peta-Jane prepared and presented a seminar to senior staff of a large international mining company, concerning environmental standards and relevant legislation in Zimbabwe. The seminar discussed the existing legislation relating to the environment (and specifically, to mining operations) along with the current EIA policy and environmental legislation projections for the future.

5 Natural Resource Management and Wildlife Conservation

Mozambique: Restructuring of Gorongosa National Park. For GTZ, 1994. Peta-Jane assisted in the preparation of a document delimiting the boundaries (and establishing current land-use activities) of Gorongosa National Park, Mozambique as part of the restructuring programme for National Parks and wildlife areas within Mozambique.

Southern Africa: Summary of Sport Hunting Activities in Southern Africa. Funded by GTZ, 1994. Peta-Jane compiled a document summarising the sport hunting statistics for Southern Africa, which included daily rates, gross income, tenure systems etc. The report forms part of the data required for the development of management plans and feasibility studies for commercial hunting ventures in eastern Africa.

Zimbabwe: Elephant Population Survey. For the Ministry of Environment, Government of Zimbabwe, 1994. Peta-Jane assisted in preparation of a study summarising elephant counting techniques

used in Zimbabwe. She was also involved in summarising the results of the various counts, which formed the basis for the analytical trends indicative of elephant populations in southern Africa, and provided recommendations on refinements to existing census and analysis techniques. The overall report represents the most up-to-date and reliable summary of elephant populations and migratory patterns for southern Africa, and was instrumental in the run-up to the CITES Convention meeting of 1997.

Southern Africa: Wildlife Management of African Buffalo Herds. Funded by GTZ, 1994. Peta-Jane was responsible for the compilation of guidelines for the establishment of intensively managed herds of African buffalo to produce foot-and-mouth disease-free calves in Zimbabwe.

Signed:

A handwritten signature in black ink, consisting of a capital letter 'P' followed by a stylized, sweeping line that extends to the right and then curves back down.

Peta-Jane Spong
23/09/2015

Form TECH-6: Curriculum Vitae (CV) for Proposed Professional Staff

1. Proposed Position: Terrestrial Ecologist

2. Name of Firm: Black Crystal Environmental Consultants

3. Name of Staff: Susan Childes

4. Date of Birth: 12 July 1957 **Nationality:** Zimbabwean

5. Education:

BSc Hons (Zoology & Botany), University of Rhodesia, 1978

MSc (Ecology) *cum laude* University of Witwatersrand, 1984

6. Membership of Professional Associations: N/A

7. Other Training: N/A

8. Countries of Work Experience:

Zambia, Zimbabwe _____

9. Languages:

<i>Language</i>	Reading	<i>Speaking</i>	<i>Writing</i>
English (mother tongue)	Good	Good	Good
French	Fair	Fair	Poor

10. Employment Record:

From: 2007

To: Present

Employer: Black Crystal Environmental Consultants

Positions held: Ecologist

From: 1996

To: 2007

Employer: various consultancies on a range of projects with: Africa Resources Trust, Bird Life Zimbabwe, Environment Africa, Biodiversity Foundation for Africa, Crocodile Farmers Association of Zimbabwe.

Positions held: Ecologist

From: 1989

To: 1995

Employer: Claremont Orchards

Position held: Floriculture Manager

From: 1979

To: 1989

Employer: Department of National Parks

Positions held: Ecologist

<p>11. Detailed Tasks Assigned</p> <ul style="list-style-type: none">• Review existing reports and data• Co-ordination of fish study & other biophysical component• Site visit and detailed field work• Update vegetation map, if necessary• Survey of wildlife• Analysis of potentially fatal flaws, impacts and mitigation measures• Report compilation and feedback	<p>12. Work Undertaken that Best Illustrates Capability to Handle the Tasks Assigned</p> <p>Name of assignment or project: Environmental Impact Assessment (EIA) for phase I and phase II of the Pungwe Hydropower project_____</p> <p>Year: 2011- 2013_____</p> <p>Location: Nyanga District, Zimbabwe_____</p> <p>Client: Independent public-private partnership_____</p> <p>Main project features: Phase I: 2.8MW and Phase II 15MW_____</p> <p>Positions held: Ecological Consultant and Project Leader__</p> <p>Activities performed: Conducted the EIA for the Pungwe Hydropower project with a team of specialists. Phase I fully complied with Zimbabwean Environmental Legislation and Phase II (on going) will comply with IFC and Equator Principle Standards_____</p> <hr/> <p>Name of assignment or project: Environmental Impact Assessment (EIA) for Lake Mutirikwe Hydropower project__</p> <p>Year: 2012_____</p> <p>Location: Masvingo District, Zimbabwe_____</p> <p>Client: Independent public-private partnership_____</p> <p>Main project features: 5 MW scheme based at wall of existing dam_____</p> <p>Positions held: Ecological Consultant and Project Leader__</p> <p>Activities performed: Ecological assessment and EIA report compilation and client liaison for Lake Mutirikwe Hydropower project with a team of specialists.</p>
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	<p>Name of assignment or project: Environmental Impact Assessment (EIA) for Duru River Hydropower project_____</p> <p>Year: 2011_____</p> <p>Location: Nyanga District, Zimbabwe_____</p> <p>Client: Independent public-private partnership_____</p> <p>Main project features: 8.7MW run of river scheme (Greenfield site)_____</p> <p>Positions held: Ecological Consultant_____</p> <p>Activities performed: Specialist Ecological Assessment</p>
	<p>Name of assignment or project: Environmental Impact Assessment (EIA) for the development of a fish farm on Lake Kariba_____</p> <p>Year: 2008_____</p> <p>Location: Lake Kariba, Zimbabwe_____</p> <p>Client: Africa Sun Hotels (Public company)_____</p> <p>Main project features: Tilapia fish farm using floating aquatic plants as a feed supplement_____</p> <p>Positions held: Consulting Ecologist_____</p> <p>Activities performed: Ecological assessment and EIA report compilation_____</p>
	<p>Name of assignment or project: Biodiversity Survey of Katombora Islands, Zambezi River_____</p> <p>Year: 2005_____</p> <p>Location: Zambia_____</p> <p>Client: Environment Africa (NGO)_____</p> <p>Main project features: Assessment of biodiversity through botanical, butterfly, bird, amphibian, reptile, mammal and fish surveys_____</p> <p>Positions held: Consulting Ecologist_____</p> <p>Activities performed: Co-ordinator of the Biodiversity Survey and author of the associated report._____</p>

	<p>Name of assignment or project: Victoria Falls Combination Master Plan_____</p> <p>Year: 2000_____</p> <p>Location: Victoria Falls, Zimbabwe_____</p> <p>Client: CIDA/Victoria Falls Consortium _____</p> <p>Main project features: Development of a plan that incorporates expansion of Victoria Falls town whilst addressing the potential impact on surrounding wildlife and wilderness area_____</p> <p>Positions held: Consultant Ecologist _____</p> <p>Activities performed: Vegetation survey, mapping, co-ordination of bird and mammal surveys, preparation of Environmental Specialist Report_____</p>
	<p>Name of assignment or project: Department of National Parks & Wildlife Management, Zimbabwe_____</p> <p>Year: 1979-83/1985-89 (9 years)_____</p> <p>Location: Hwange National Park, Matetsi Safari Area, and Nyanga National Park, Zimbabwe_____</p> <p>Client: Employed by the Government of Zimbabwe_____</p> <p>Main project features: Project features varied, but related to activity listing below._____</p> <p>Positions held: Ecologist_____</p> <p>Activities performed: Work included the surveying and mapping of vegetation, development of management policies for fire, road alignment, surveying wild life populations, monitoring status and distribution of Wild Dog, <i>Lycaon pictus</i>, and the compilation of vegetation and bird checklists. In Nyanga, the major focus was on developing a practical method for controlling the alien invasive plants in the montane grasslands, particularly wattle (<i>Acacia mearnsii</i> and <i>A. dealbata</i>) and pine (<i>pinus sp.</i>). Activities also included the initiation of the first Blue Swallow (<i>Hirundo atrocaerulea</i>) survey and awareness raising around the threatened status of the species.</p> <p>_____</p>

13. Certification:

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes myself, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.



Susan Lawley Childes Date: 29 July 2013
 [Signature of staff member or authorized representative of the staff] Day/Month/Year
 Full name of authorized representative: _____

Curriculum Vitae: Robert Stewart Burrett

Fields of expertise

Southern African archaeology, history, ethnography, geology & botany

Background

- Born Bulawayo, Zimbabwe. 19th September 1964
- In relationship

School Education

Primary - Marlborough & Hallingbury Schools (Harare).

Senior - Marlborough High School (Harare) & Damelin College (Johannesburg).

University Record

BSc (with distinction) & BSc Honours (Upper Second Class) both from the University of the Witwatersrand, South Africa.

Notes -

- i. First WITS BSc student granted permission to do Double Honours programme in Geography & Archaeology.
- ii. received several bursaries towards my studies from the Human Sciences Research Council (HSRC), the University itself and Edenvale (SA) Town Council
- iii. awards achieved during this time include:
 - R. A. Pelletier Prize in Geology
 - Van Riet Lowe (Undergraduate) Prize for Archaeology
 - Van Riet Lowe (Graduate) Prize for Archaeology
 - Chamber of Mines Bronze Medal for the Best First Year Earth Sciences student
 - Chamber of Mines Silver Medal for the Best Second Year Earth Sciences student
 - Chamber of Mines Gold Medal for the Best Third Year Earth Sciences student
 - John Wellington Gold Medal for the "Most outstanding Geography Undergraduate Student
 - Geography Department Book Prize for the Best Graduate Student.
 - Also numerous Certificates of Merit for Archaeology, Geography and Geology. List supplied if required.
- iv. MSc (with distinction). University of the Witwatersrand, South Africa. Dissertation entitled "Investigating Pfupi: a Later Stone Age Culture in North-eastern Zimbabwe".
- v. Currently working on PhD, UNISA. Frontier Contact and koBulawayo.

Employment

1986 - Archaeologist Great Zimbabwe, National Museums and Monuments of Zimbabwe.

1987 - Lomagundi College, Chinhoyi, Zimbabwe.

1988 to 1998 - Saint George's College, Harare, Zimbabwe.

1999 to 2000 - Peterhouse Boys School, Marondera, Zimbabwe. Head of Department.

2001 - Saint George's College, Harare, Zimbabwe (part-time while doing Masters).

2002 to 2003 - Independent CRM (Cultural Resources Management) Consultant while doing Masters.

2004 - Saint John's College, Harare, Zimbabwe. Part-time post in senior management running International Baccalaureate Programme for higher level pupils. Also lecturer in Archaeology (History Department), University of Zimbabwe, as well as continuing my independent CRM work.

2005 - Senior Curator Archaeology, Museum of Human Sciences, Harare, Zimbabwe.

2006 to date. Independent CRM (Cultural Resources Management) Consultant & projects development manager of various manufacturing and tourism related companies in Zimbabwe & Zambia.

2010 to date. Joined Black Crystal Consultancy as an associate. This is an established Environmental Consultancy firm based in Harare, Zimbabwe.

2012 to date. Associate Researcher (unpaid position), Natural History Museum of Zimbabwe, Bulawayo, Zimbabwe.

Membership of Relevant Professional Associations

- Association of Southern African Professional Archaeologists, Cultural Resources Management Section
- Prehistory Society of Zimbabwe
- South African Archaeological Association

Cultural Resource Management Activities

1979/80. Excavations at Crowborough, Harare, Zimbabwe

1982-5. Extensive recognisance of the Magalliesberg, South Africa. Assisted with excavations at Jubilee Shelter; Caves Elizabeth & James; and Hope Hill & Fort Troje Shelters - all Later Stone Age deposits

1982-84. Assisted with recognisance of rock art sites in the Harrismith region, Free State, South Africa

1983. Assisted in mapping of the Suikerbosrand stone ruins south of Johannesburg, South Africa. Late Farming Community (Iron Age) village site

1983-4. Laboratory analysis of stone, bone and soil samples from Jubilee Shelter; Hope Hill and Fort Troje, South Africa. All Later Stone Age deposits

1984. Assisted excavation at Tavhatshena, southern Soutpansberg, South Africa. Venda period Farming Community site

1984. Archaeological Impact Assessment of by-pass route for Transvaal Roads Department at Piet Retief, Mpumalanga, South Africa

1985. Excavations at Silkaatsnek, west of Pretoria, South Africa. Honours project. Middle Stone Age deposit associated with natural spring

1986. Great Zimbabwe, Zimbabwe. Excavations and extensive mapping of walls for UNDP Project while working for National Museums & Monuments of Zimbabwe (NMMZ). Work done site pending inscription as World Heritage Site
1986. Excavations at Goose Bay, Masvingo, Zimbabwe. Farming Community furnace site.
1986. Preliminary Impact Assessment of Mazwikadi Dam, Banket, Zimbabwe at bequest NMMZ
1988. Assisted Museum of Human Sciences, Harare (NMMZ) in the preparation of new site Museum at Tsindi Ruins, Marondera, Zimbabwe
1990. Assessment of archaeological material on Carolina Wilderness area, south of Harare, Zimbabwe for ecotourism project
1994. Archaeological Impact Assessment. Angwa Arch Dams, Lions Den, Zimbabwe
1994. Archaeological & historical consultancy on the Colonial and preColonial history of Ayrshire Mine, Banket, Zimbabwe
- 1994/5. Initiated cultural CAMPFIRE programme in the Chinamora area, Goromonzi, Zimbabwe
1995. Initiated interest in and later assisted archaeologists of the Museum of Human Sciences, Harare (NMMZ) in the identification of historical materials excavated at Ballyhooley Hotel, Ruwa, Zimbabwe
1995. Assisted NMMZ with the development of new Domboshava Site Museum, north of Harare, Zimbabwe
1995. Field assessment and write up of archaeological material on the estate of Lodge of the Ancient City, Great Zimbabwe (Zimbabwe) for Touch of the Wild (Pvt.) Ltd
1995. Assisted Senior Curator (Archaeology) at the Museum of Human Sciences, Harare (NMMZ) in the identification of historical materials excavated at several Later Stone Age Deposits from western Lesotho.
1996. Assisted NMMZ with Archaeological Impact Assessment at Copper Queen, Gokwe, Zimbabwe
1996. Assisted work of History Society of Zimbabwe to draw up a series of historical trails through Harare and prepared booklet (preliminary only) for these trails
1997. Field assessment of archaeological material on Senuko 1 and 2 for Safari Suns to be included in their Cultural Tourism Package by their guides
1997. Project assessment for Zimbabwe Suns as to possible options for Cultural Tourism at Great Zimbabwe Hotel, Troutbeck; Victoria Falls Hotel; and Bulawayo Sun
1997. Assisted NMMZ with excavation of Cairnsmore Shelter, Concession, Zimbabwe
- 1997-2002. Detailed research into the old colonial Settlement of Tati (1867-1896), NE Botswana for cultural-historical tourism package by the landowner
- 1997/8. On behalf of the Society of Jesus (South Africa and Zimbabwe), as well as the Supa-Ngwao Museum, Francistown, Botswana researched the history of the Jesuit Mission at Old Tati, north-eastern Botswana
1998. Heritage impact assessment. Willdale Brick Works, Mount Hampden, Harare, Zimbabwe
1998. Assisted in initial work towards CAMPFIRE project to develop the Rock Art sites near Mutoko
1999. Consulted for CIDA on archaeological possibilities which could be developed at Songwe Point and nearby areas, Victoria Falls in Zambia and Zimbabwe
1999. For MSc excavated Mwanza 14. Small Later Stone Age shelter on Mwanza farm, Melfort, Zimbabwe

2000. For MSc excavated Goshu I, Goshu II, and Goshu III. Three Later Stone Age shelters in the Goshu Park Private Nature Area, Marondera, Zimbabwe
2001. Assisted NMMZ with excavation of Makumbe Cave (Upper), Chinamora Communal Lands, north of Harare, Zimbabwe. Later Stone Age deposit
2001. Archaeological Impact Assessment of Quarry Enterprises Black Granite Site, Headlands, Zimbabwe
2001. Archaeological Impact Assessment of Golden Quarry Mine, Odzi, Zimbabwe
2001. Archaeological Impact Assessment of three “Black Granite” Sites (Leopard’s Kopje, Kabesa, Nyamazuwe), Mutoko, NE Zimbabwe for Quarry Enterprises
2001. Archaeological and Heritage impact assessment of Umvimila Industrial Park, Bulawayo, Zimbabwe
2001. Preliminary project assessment of archaeology in Victoria Falls and Livingstone areas for CIDA
2002. Heritage impact assessment of Pomona Extension Urban Development, Harare, Zimbabwe
2002. Archaeological Impact Assessment of Great Dyke Eluvial Chromite Deposits
2002. Archaeological Impact Assessment of Cleveland Dam NGO Office Development site, Harare, Zimbabwe
2002. 2002. Jesuit Memorial, KoBulawayo. Designed proposed Site Museum and displays for the 1879-1887 Jesuit Mission of the Sacred Heart
2003. Archaeological Impact Assessment for three black granite quarry sites (SG3, Manwick & Floquet), Mutoko, Zimbabwe for Q Enterprises
2003. Archaeological Impact Assessment of Victoria Falls (Zimbabwe) NSSA shopping centre
2003. Archaeological Impact Assessment of Ngezi Underground, new plant site and tailings dam near Selous, Zimbabwe
2003. Archaeological Assessment and educational development plan for Umgeni Nature Reserve, Howick, KwaZulu-Natal, South Africa
2003. Archaeological Mitigation Mapungubwe World Heritage Park. Farming Community sites mapped and excavated
2003. Archaeological Assessment for educational purposes for Hilton College, Hilton, KwaZulu-Natal, South Africa
2003. Compiled consolidated Heritage impact assessment. Ngezi Platinum Mine, Selous, Zimbabwe
2003. Development of new displays for the Natal Museum, Pietermaritzburg, South Africa, covering the Portuguese on the East Coast of Africa, the Swahili, and the rise of complex states in southern Africa
2003. Archaeological Assessment and Heritage Management Plans for Garonga Estate, Limpopo Province, South Africa
2004. Archaeological Impact Assessment of Mimosa Housing Estate and new Zvishavane sewage Works, Zvishavane, Zimbabwe
2004. Archaeological Impact Assessment of Nyamakope Black Granite Claim, Mutoko, Zimbabwe
2004. Archaeological Impact Assessment of Turf Housing Estate and Water works, Ngezi, Zimbabwe
2004. Heritage impact assessment of Weya Black Granite Claim, Mutoko, Zimbabwe
2004. Heritage impact assessment of Marima Black Granite Quarry, Mutoko, Zimbabwe

2005. Archaeological and Historical Assessment and Heritage Management Plans for Mmabolela Estate, Limpopo Province, South Africa
2005. Archaeological Impact Assessment of Midwinter Gold mine, Chegutu for Metallon Zimbabwe
2005. Heritage impact assessment of Borrowdale Brooke Hotel complex, Harare, Zimbabwe
2005. Archaeological and heritage assessment of several properties of south Northern Tuli Block, Botswana
2005. Assisted with developing new Management Plan for Victoria Falls World Heritage Site
2005. Heritage impact assessment of Silver Oaks property, Mutare, Zimbabwe
2005. Archaeological Impact Assessment of Masvingo Mission Irrigation Scheme, Mberengwa, Zimbabwe
2005. NMMZ excavations and photographic record of Dhlo Dhlo Ruins, Shangani, Zimbabwe. In conjunction with running the first National Museums & Monuments of Zimbabwe Field School. Assistant Director of programme
2005. Archaeological Impact Assessment of One Step Mine, Battlefields, Zimbabwe
2005. Project proposal for Murawa's Hill Environmental and Heritage Centre, Mutare, Zimbabwe. For National Trust of Zimbabwe
2005. Archaeological Impact Assessment of Mbubu Limestone Deposits, Murewa North, Zimbabwe
2005. Historical assessment of the route of the Czech Nineteenth Century traveller Emil Holub for Czech Embassy, Harare
2006. Produced several archaeological posters for the Czech Embassy, Harare for their Botswana exhibition on the early Czech Explorer Emil Holub
2006. Archaeological Impact Assessment of two new mines, Arcturus Mine, Zimbabwe.
2006. Venetia Game Reserve excavations and survey. Excavations of Farming Community (K2 and Khami) sites in the Mapungubwe area, South Africa
2006. Archaeological Impact Assessment of new mine slimes dam, Shamva Mine, Zimbabwe
2006. Archaeological Impact Assessment of new mine slimes dam, Jumbo Mine, Mazowe, Zimbabwe
2006. Archaeological Impact Assessment and Heritage Management Plan for proposed developments at Redwing Mine, Penhalonga, Zimbabwe
2006. Edited booklet on adventure stories by the Nineteenth Century Czech Traveller Emil Holub. Funded by Czech Embassy and to be printed by Mambo Press, Gweru
2006. Compiled a new, professional assessment course on Cultural Resource Management for the University of South Africa Honours Course
2007. Archaeological Impact Assessment of shopping centre extension, Tzaneen, South Africa
2007. Created series of posters for the German Embassy, Harare covering the explorations of the nineteenth century traveller, Karl Mauch
- 2007/9. Assessment of cultural resources and production of heritage management plan including a Culture House (Community Museum) in Mwandi, Western Zambia. Report funded by Czech Embassy, Harare
2007. Archaeological Impact Assessment of Chundu Island, Victoria Falls, Zimbabwe
2007. Archaeological Impact Assessment and historical review for Waterberry Lodge, Livingstone, Zambia
2007. Cultural and Environmental Management Plan for Hillside Dams Community Trust, Bulawayo, Zimbabwe

2007. Cultural Resource Assessment and Management Plan to develop Culture House (community museum) and crafts centre, Botha Buthe Plateau, Lesotho. Funded by World Bank and Peace Parks Foundation.
2007. Put together special Great Zimbabwe heritage package for “Inn on Great Zimbabwe”, Masvingo, Zimbabwe
2007. Worked with Barotseland Development Trust, Mwandu, Zambia on several community projects relating to tourism
2007. Worked with the Ministry of Culture, Lesotho to develop a National Heritage Strategy for the Kingdom of Lesotho. Input subsequently used for application for extensions to Maluti World Heritage Site status
2009. Archaeological & Heritage consultant for the Zimbabwean IDP of the KAZA Transfrontier Initiative
2009. Published book on the Anglo South African War in Botswana and Zimbabwe and direct various operators on how to include this in their packages
2009. Production of poster display for the Czech Embassy, Zambia entitled “Tears of the Crocodile; visions of early Lozi Society by the Czech Traveller Emil Holub”
2009. Task team to revive Management Committee for Matobo Hills World Heritage Site
2010. Archaeological Impact Assessment of Indamara Mine, Kwekwe
2010. Archaeological Impact Assessment of Camp Hwange, Shumba Pan, Hwange National Park
2011. Park Management Proposal, Tuli Safari Area, Thuli, Zimbabwe for developers
2011. Full Environmental Impact Assessment for Mugondi-Musirizwi Irrigation Scheme, Chipinge, Zimbabwe
2011. Carbon assessment for natural forests in Hurungwe, Nyami-Nyami and Binga-Songo Districts, Zimbabwe. For Carbon Green Africa carbon sequestration assessment
2011. Archaeological Impact Assessment for Great Zimbabwe hydro-electric project, Masvingo. Zimbabwe
2011. Assessment of infestation of *Lantana camara* in the Victoria Falls area of Zimbabwe (World Heritage Site) and project proposals to deal with the same
2011. Archaeological Impact Assessment for Pungwe hydro-electric project, Nyanga, Zimbabwe
2011. Post project assessment of a UNDP-SGF funded intervention in Matopos, Zimbabwe
2011. Advised Elephant Experience, Victoria Falls on Environmental compliance after they were fined for negating their Impact assessment Report
2011. Completed several posters on the Mwandu District and the Lozi People for small regional site museum, Mwandu, Zambia. Funded by Czech Embassy, Zambia
2011. Archaeological Impact Assessment for Umfurudzi Safari Area, Shamva, Zimbabwe
2012. Archaeological Impact Assessment for Duru hydro-electric project, Watsomba, Zimbabwe
2012. Archaeological Impact Assessment for Chisawasha Housing Project, Harare, Zimbabwe
2012. Assisted in developing carbon offsetting programme for SAA flights to Zimbabwe
2012. Archaeological Impact Assessment and heritage management plans for Unki Mine, Shurugwi, Zimbabwe
2012. Proposed Management Plans for Matetsi 7 Safari Area, Victoria Falls, Zimbabwe
2012. Proposed Management Plans for Lake Chivero Recreational Park, Harare, Zimbabwe
2012. Proposed Management Plans for Matowa area, Hwange National Park, Zimbabwe

2012. Proposed Management Plans for Tshabalala Recreational Park, Bulawayo, Zimbabwe
2012. Archaeological Impact Assessment and full Environmental Prospectus Report for Gaerezi Hydro-electric Project, Nyanga, Zimbabwe
2012. Compiling history and booklet for the centenary of PPC and the cement industry in Zimbabwe for company
2012. Heritage notes for tourism website - www.goZimbabwe.com
2012. Archaeological Impact Assessment, Ncema River Gravels Gold Extraction, Mbalabala, Zimbabwe
2012. Heritage section for calendar for Zimbabwean tourism website - www.GreatZimbabwe.com
2012. Independent review for IUCN panel of African application for World Heritage Site status
2012. Archaeological Impact Assessment and heritage management plans for Chisawasha Mission, Harare, Zimbabwe
2012. Heritage assessment for Environmental Management Plan, Alaska Dolomite, Chinhoyi, Zimbabwe
2012. Archaeological Impact Assessment for NRE on Pungwe B Hydroelectricity Project, Nyanga, Zimbabwe
- 2012+. Digitalisation of collections of National Railways of Zimbabwe Museum collections and upgrading of museum displays (*in progress*)
- 2013+. New site museum displays for Khami Ruins World Heritage Site, Bulawayo, Zimbabwe (*in progress, should be complete 2015*)
- 2013+. Schools educational programme. Rowallan Adventure Park, Matobo Hills World Heritage Site, Zimbabwe (*in progress*)
2013. Developed new Cultural trail for the CBD and Townships of Bulawayo, Zimbabwe for Amakhosi Cultural Centre
- 2013+. Development of new Railway Museum, Victoria Falls, Zimbabwe. For Econet Zimbabwe and associated partners (*in progress*)
2013. Research of company history for Portland Holdings and compilation of Centenary booklet
2013. Production of heritage displays for Sprayview Hotel, Victoria Falls
2013. Production of heritage displays for Jafuta Trust, Victoria Falls
2013. Production of heritage displays for Victoria Falls Hotel and Meikles Leisure
2013. Independent review for IUCN panel of three African applications for World Heritage Site status
2013. Archaeological Impact Assessment for Umfurudzi Park, cottages and airstrip, Shamva, Zimbabwe
2013. Assisted in fatal flaws analysis of proposed JSPL Mozambique Minerals Lda Mozambique Coal Slurry Pipeline Project Proposal
- 2013-4. Archaeological, palaeontological and heritage assessment. Hwange Power Station Expansion for Africa Development Bank
- 2013+. Production of series of heritage booklets for Zimbabwe. 24 themes envisaged by end of project. See bibliography for details.
2013. Heritage assessment for Environmental Management Plan, Ncema River Alluvial Gold, Filabusi, Zimbabwe
- 2014+. Historical research and project proposals for historical house Sunrising, Bulawayo, Zimbabwe for Econet Zimbabwe

- 2014+. Development of historical display in Hwange South Concession area, Zimbabwe for Econet Zimbabwe
2014. Heritage review for Goldchip Mine, Chikari, Zimbabwe
2014. Assessment team for Matobo Hills World Heritage Site new Management Plan 2014-2019
2014. Research and production of text and illustrations for “Bulawayo @ 120 Historical Exhibition”, for Natural History Museum of Zimbabwe and Bulawayo City Council, Bulawayo, Zimbabwe
2014. Heritage assessment for Environmental Impact Assessment and Management Plan, Teutonic Mine, Filabusi, Zimbabwe
2014. Heritage review and Environmental Management Plan, Batoka Gorge Hydro-electric Scheme, Zambezi River Authority
2014. Preliminary review of Zimbabwe Parks & Wildlife Management Authority infrastructure in 14 major Zimbabwe National Parks. For client Crafford & Crafford, Tswane, South Africa
2014. Heritage assessment for Environmental Impact Assessment and Management Plan, Steeldale Gas Wholesale, Bulawayo, Zimbabwe
- 2014-5. Preparation of new museum displays for the National Railways of Zimbabwe Museum, Bulawayo, Zimbabwe
2015. Preliminary Review of Heritage, Malilangwe Solar Project, Chiredzi, Zimbabwe
2015. Preliminary Environmental and Heritage review of RETPARK Solar Project, Middle Save, Zimbabwe
2015. Preliminary Heritage review for Santonga Recreational Park, Victoria Falls, Zimbabwe
2015. Heritage review for Goldchip Mine Extension, Chakari, Zimbabwe
2015. Preliminary Heritage review for planning purposes GPR Platinum Mine, Selous, Zimbabwe
2015. Ecological & Heritage Management Plan for Mabukuwene, Bulawayo property of National Trust of Zimbabwe.
2015. Biodiversity Workshop, BROA, in Harare to assist the client with implementation of objectives - Rift Valley.

Related Cultural Resource Matters

- Participant in several South African Association of Archaeologists Conferences.
- As student won scholarship to attend the International Taung Diamond Jubilee Symposium in 1985.
- Assisted with developing and erecting several temporary displays, Museum of Human Sciences, Harare.
- Leader of archaeological groups in the Zimbabwe Schools’ Exploration Society.
- Since 1988 very involved on the Council of the Prehistory Society of Zimbabwe. Chairman 1989 and 1990, and again 1998-2000. Assistant Editor of their journal Zimbabwe Prehistory No. 21, and editor Nos. 22, 23 & 24.
- Co-ordinating group for the 10th Congress of the Pan African Association for Prehistory and Related Studies held in Harare, June 1995.
- Associate Researcher, History Department, University of Zimbabwe 1999-2001.

- Produced a layman's booklet on the archaeology of Zimbabwe. This is as a response from request from the Zimbabwe Professional Hunters and Guides Association.
- History Society of Zimbabwe. Member of Mashonaland Committee 1990-3. Involved in writing for their journal Heritage on an annual basis since 1988.
- Have been invited on several occasions to address the Friends of the Supa-Ngwao Museum, Francistown, Botswana.
- Apart from the frequent Prehistory Society and History Society Excursions I have arranged and spoken on archaeology to numerous school parties and interest groups throughout Zimbabwe and northern Botswana. I have also been paid to run archaeological interest groups for the University of Richmond (USA) and Archaeological Tours Ltd of New York (USA). Currently developing projects for Global International (UK) and two travel agents in South Africa.
- Documentation of the graves of all those ANZAC members who died during the Anglo-South African War. Request from the Australian and New Zealand Governments. Recently asked to do the same with Imperial (UK) graves in Zimbabwe & Botswana for the British Embassy, Harare.
- One time Honorary Archivist, Jesuit Province of Zimbabwe, Harare.
- Sponsored participant of Pan African Archaeological Conference, Gaborone July 2005.
- Assistant-Editor Zimbabwea, Humanities journal of National Museums & Monuments of Zimbabwe.
- Assisted with developing tourism packages for several operators in Bulawayo, Matobo Hills and Livingstone.
- Founder member of Friends of the Natural History Museum of Zimbabwe, Bulawayo. One time Chairman.
- Member of National Council of the National Trust of Zimbabwe.
- Chairman of the Friends of the National Railways of Zimbabwe, Bulawayo.

Other Involvements

The following are other interests and positions held:

- Presented paper on the origins of the colonial borders of Zimbabwe. Geography Students Association (SA). University of Natal, Pietermaritzburg, 1984.
- Geographical Association of Zimbabwe. This is a Professional Organisation involving both schoolteachers and University lecturers. I have been on National Council since 1988. Secretary 1991/2; Conference Organiser 1989/1991/ 1994/1996/1998; 2001; Chairman 1993 - 1995, and 1996-2001; Editor the Geographical Education Magazine (GEM) since 1995 - the latter is aimed a resource for teacher, especially the rural less privileged schools and I have edited 12 issues.
- In recognition of above was awarded an International Award by the Geographical Association (UK) to attend their Annual Conference in the UK in April 2001.
- Subject Panel for Geography (Curriculum Development Unit, Ministry of Education, Zimbabwe) 1996-2001.
- Lecturer on Geography and Archaeology, RIFA Conservation Camp (Chirundu) from 1988 to 1993.
- Zimbabwe Schools' Exploration Society. Part of Mashonaland Committee from 1992 until 1995.

- Been very involved in the activities of the Tree Society of Zimbabwe.
- 1991 to 1994. Involved with local Councillor in Highlands (Harare, Zimbabwe) in trying to improve the Parks and Greenbelts in the Ward.
- 1994 to 1997. Very involved in Greystone Nature Preserve, Harare. Small urban Greenbelt project. Honorary Life Member.
- 2006-2014. Shareholder working on redeveloping the Hillside Dams Conservancy. A Bulawayo-based community initiative to develop a natural park along the Hillside Dams.
- Life Member of the Friends' of the Botanical Gardens, Harare, Zimbabwe.
- Member of Executive Committee, Association of Business in Zimbabwe (ABUZ) 2011-2013.
- Committee Member Matobo Conservation Society.
- Have shares in a company growing indigenous trees for the Gauteng (South Africa) market as well as producing essential oils.
- Co-partner in goat rearing project, Heany Junction, Bulawayo.

Certification:

I, the undersigned, certify that to the best of my knowledge and belief, this bio-data correctly describes myself, my qualifications, and my experience.



Date: 23 September 2015

A BIBLIOGRAPHY CAN BE SUPPLIED OF MY PUBLICATIONS IF REQUIRED.

CURRICULUM VITAE

1. *Proposed Position* : Public Health Specialist
 2. *Name of Firm* : Ecologic Limited
 3. *Name of Staff* : Jacob CHISHIBA
 4. *Date of Birth* : April 6, 1961
 - Nationality* : Zambian
 - Email* : jchishiba@gmail.com
-

5. KEY EDUCATION:

- M.Sc: Environmental Management and Policy: Lund University, **Sweden** (1998)
Thesis: Reduction of nutrient-rich industrial waste discharged to Kafue River (using Cleaner Production Approach)
- B.Sc. Natural Sciences: University of Zambia, (1985)
Final Year Major Subjects: Chemistry
-

6. *Membership of Professional Associations:*

Former Board Member of the International Network of Green Planners (INGP) with secretariat based in the Netherlands.

Member of the Southern African Botanical Diversity Network

Vice Chairperson of the Institute of Waste Management of Southern Africa-Zambia Chapter

7. OTHER TRAINING

I hold a Master of Science Degree in Environmental Management and Policy from Lund University, Sweden with concentrations in Environmental Health, Ecology, Policy and Law, Sustainable Development, Environmental Management System and ISO 14001 Implementation, Cleaner Production, Environmental Economics, Environmental Technology and Environmental Impact Assessment. I am also in possession of a Bachelor of Science Degree in Natural Sciences from the University of Zambia. In addition I have attended a postgraduate course in Criminal Procedure and Prosecution from Zambia Institute of Advanced Legal Education.

I have over 20 years working experience in environment and sustainable development assignments. I worked as Team Leader on assignments for Lunsemfwa Hydro Power Company (LHPC) involving environmental impact assessment of the *Construction of a Power House at Johnson Valve at Mulungushi Dam & a 2 Kilometer Power Transmission Lines*” also on the *Upgrading and installation of No. 4 Turbine Generator at Lunsemfwa Hydro Power Station* and the assignment involving *Construction of a 3km long canal for hydro*

power generation at Mulungushi Power Station leading to development of environmental management plans. I have also worked on a consultancy work for United Nations Office for Projects (UNOP), Kenya, involving Environmental Impact Assessment (EIA) of Small Earth Dams and Development of Guidelines for Zambia Rural Small Works Programmes for Water and Food Security. Further, I have also worked as an Environmental Management Specialist and Team Leader on a consultancy work for Ministry of Energy and Water Development involving development of the Environmental and Social Management Framework and the Resettlement Policy Framework for the project on *Increased Access to Energy and ICT Services* funded by World Bank.

My work experience dates back to 1985 when I joined the then ZCCM, Nkana Division where I worked for 6 years in mining environmental management. I left ZCCM in May 1992 to join the Environmental Council of Zambia (ECZ) where I worked for 10 years on different aspects of environmental management including development of Statutory Instruments for pollution control relating to energy, water, waste, air, pesticides and toxic substances and environmental impact assessment, which are currently being implemented. I am presently working for Kaizen Consulting International as an Environmental Specialist in the area of environment and sustainable development.

8. COUNTRIES OF EXPERIENCE

- Botswana
- Bulgaria
- Sweden
- Zambia

9. LANGUAGES

	Speaking	Reading	Writing
English	Very good	Very good	Very good
Bemba	Very good	Very good	Very good
Nyanja	Basic	Basic	Basic

Excellent, Very good, Good, Fair, Basic

10. EMPLOYMENT RECORD

Assignments with Environmental Council of Zambia [Lusaka, Zambia]

(1992-2001):

Date: 2000
Location: Lusaka, Zambia
Position: Environmental Management Consultant
Client: Zambia Social Investment Fund (ZAMSIF)/Ministry of Finance and National Planning [funded by Worldbank]
Project: Environmental Impact Study and Guidelines of the Planned Zambia Social Investments Fund [funded by Wordbank]
Assignment: Carried out an environmental impact study of the planned Zambia Social Investment Programme.

Date: 2000
Location: Mazabuka, Zambia
Position: Environmental Management Consultant

Client: Plan International (Zambia)
Project: Maggobbo Flood Control Scheme in Mazabuka
Assignment: Develop Environmental Management Plan for the proposed Maggobbo Flood Control Scheme in Mazabuka.

Date: 1992-2001
Location: Lusaka, Zambia
Position: Head of Cleaner Production and Project Management
Client: Environmental Council of Zambia, Lusaka, Zambia
Project: Industrial Pollution Prevention Programme [funded by NORAD]
Assignment: Design, development and implementation Environmental Management Programmes in Zambian industries.

Date: 1999
Location: Lusaka, Zambia/Canada
Position: Head of Delegation on Mission to Canada to Study Groundwater Contamination Assessment in Canada
Client: Environmental Council of Zambia
Project: Groundwater Contamination Assessment Project [funded by CIDA]
Assignment: Project Manager for Study on assessing groundwater contamination from landfill sites, cemetery, industrial site and conducting a vulnerability mapping assessment.

Date: 1999
Location: Lusaka, Zambia
Position: Project Manager
Client: Environmental Council of Zambia
Project: Kafue River Weed Bloom Study and Control Program [funded by CIDA]
Assignment: Project management, co-ordination and supervision of the day-to-day activities of the program.

Date: 1995-1996
Location: Kabwe, Zambia
Position: Project Manager
Client: United Nations Centre for Human Settlement (Habitat)
Project: Urban Water Supply and Sanitation [funded by Habitat]
Assignment: Development of a Management tool for the Monitoring and Control of Toxic Substances and untreated effluent with a view to protecting water resources in Kabwe town, Zambia.

Date: 1994-1996
Location: Lusaka, Zambia
Position: Project Manager
Client: Environmental Council of Zambia
Project: Industrial Pollution Prevention Programme [funded by NORAD]
Assignment: Co-ordinated the implementation of Cleaner Production and Environmental Management System in Zambian industries with specific focus on Premium Oils Industries as a pilot case study in Lusaka, Zambia.

Date: 1993
Location: Lusaka, Zambia
Position: Environmental Management Specialist
Client: Zambia Privatization Agency

Project: Environmental Assessment Studies for Companies earmarked for privatisation [funded by USAID]
Assignment: Co-ordinated the implementation of Cleaner Production and Environmental Management System in Zambian industries with specific focus on Premium Oils Industries as a pilot case study in Lusaka, Zambia.

EMPLOYMENT

Assignments with former Zambia Consolidated Copper Mines (ZCCM) Ltd (Kitwe, Zambia) (1985-1992)

Client: Zambia Consolidated Copper Mines (ZCCM) Limited, Nkana Division, Analytical Services, Kitwe, Zambia
Project: Head of Pollution Control Section
Assignment: Supervisory of the departmental activities in charge of pollution control and monitoring of mining discharges to the environment including water quality analysis.

11. SUMMARY OF KEY EXPERIENCE:

Assignments with Kaizen Consulting International:

Date: June 2012
Location: Kabwe, Zambia
Position: Team Leader/ Project Co-ordinator
Client: Lunsemfwa Hydro Power Company
Project: Environmental Project Brief for the *Construction of a Power House at Johnson Valve at Mulungushi Dam & 2 Kilometer Power Transmission Lines* and development of environmental management plan
Assignment: Environmental assessment of the impacts of *Construction of a Power House at Johnson Valve at Mulungushi Dam & 2 Kilometer Power Transmission Lines* and development of environmental management plan

Date: 2009
Location: Kabwe, Zambia
Position: Team Leader/ Project Co-ordinator
Client: Lunsemfwa Hydro Power Company
Project: Environmental Project Brief for upgrading and installation of No. 4 Turbine Generator at Lunsemfwa Hydro Power Station and development of environmental management plan
Assignment: Environmental assessment of the impacts of construction of a 3km long canal and development of environmental management plan

Date: 2005
Location: Kabwe, Zambia
Position: Team Leader/ Project Co-ordinator
Client: Lunsemfwa Hydro Power Company
Project: Environmental Project Brief for construction of canal of 3km long
Assignment: Environmental assessment of the impacts of the project and development of environmental management plan

Date: 2006
Location: Lusaka
Position: Team Leader/ Environmental Management Specialist
Client: World Bank/Ministry of Energy and Water Development
Project: Environmental Impact Assessment for the Increased Access to Energy and ICT Services Project
Assignment: Preparation of Environmental and Social Management Framework and Resettlement Policy Framework.

Date: 2008
Location: Lusaka
Position: Team Leader/ Environmental Management Specialist
Client: World Bank/Ministry of Energy and Water Development
Project: UNDP/GRZ Renewable Energy Project for the Environmental Framework for Bio-Fuels
Assignment: Preparation of Environmental and Social Management Framework and Bio-Fuels.

Date: 2008
Location: Lukulu North (Kasama), Mumbwa & Kaoma
Position: Team Leader/ Project Co-ordinator and EIA Consultant
Client: Rural Electrification Authority (REA)
Project: Environmental Project Brief for Grid Extension for Lukulu North (Kasama), Mumbwa and Kaoma.
Assignment: Environmental assessment of the impacts of project and development of environmental management plan

Date: 2007
Location: Mazabuka
Position: EIA/Environmental Management Specialist
Client: Zambia Sugar Plc
Project: Environmental Impact Assessment of Installation of Surface Fuel Tanks at Zambia Sugar Plc
Assignment: Environmental Impact Assessment and preparation of an Environmental Management and Monitoring Plan to mitigate adverse effects for installation of surface fuel tanks.

Date: 2004
Position: EIA/Environmental Management Consultant
Client: United Nations Office for Projects (UNOP), Kenya
Project: Environmental Impact Assessment of Small Earth Dams
Assignment: Environmental Impact Assessment and Development of Guidelines for Zambia Rural Small Works Programmes for Water and Food Security.

Date: 2006
Location: Mazabuka
Position: EIA/Environmental Management Specialist and Team Leader
Client: Zambia Sugar Plc, Zambia
Project: Environmental Impact Assessment of Sugar Plantation Expansion Project
Assignment: Environmental Impact Assessment and preparation of an Environmental Management and Monitoring Plan to mitigate adverse effects for Zambia Sugar Expansion Project in

Mazabuka. The assignment covered aspects of land preparation, plantation, irrigation and sugar cane processing at the factory.

Date: 2006
Location: Mpika
Position: Team Leader/ Environmental Management Specialist
Client: Amanita Premium Oils, Zambia
Project: Environmental Impact Assessment of Oil Palm Plantation Project
Assignment: Environmental Impact Assessment and preparation of an Environmental Management and Monitoring Plan to mitigate adverse effects for Oil Palm Plantation Project in Mpika. The assignment covered aspects of land preparation, plantation and irrigation.

Date: 2009
Location: Chipata
Position: Environmental Management Specialist
Client: Road Development Agency, Zambia
Project: Pre-feasibility study of an intermodal dry port in Chipata financed by the European Union under the Sugar accompanying measures facility
Assignment: Environmental assessment of an intermodal dry port in Chipata financed by the European Union under the Sugar accompanying measures facility

Date: 2009
Location: Lusaka-Chirundu
Position: EIA/Environmental Management Specialist and Team Leader
Client: Road Development Agency, Zambia
Project: Environmental Impact Assessment for the rehabilitation of about 100 km of the Trunk Road T2 between Lusaka – Chirundu funded by European Union
Assignment: Environmental Impact Assessment and preparation of an Environmental Management and Monitoring Plan to mitigate adverse effects for rehabilitation of Lusaka-Chirundu Road.

Date: 2009
Location: Lusaka
Position: Development Economist and Team Leader
Client: Road Development Economist, Zambia
Project: Impact Monitoring of Improved Roads under the Output and Performance-based Road Contract in 8 Provinces of Zambia funded by European Union
Assignment: Undertaking socio-economic impact monitoring surveys of improved roads covering 3,634km in 30 districts (eight provinces) of Zambia and preparation of monitoring reports thereof.

Date: October 2008-March 2009
Location: Lusaka, Zambia
Position: Project Manager and Team Leader
Client: Lusaka City Council, Lusaka, Zambia
Project: Inner Ring Road Project funded by Japanese International Co-operation Aid (JICA)]
Assignment: Co-ordinating project activities, planning and undertaking the environmental and social environmental impact studies and preparation of the Environmental Management Plan and Resettlement Action Plan.

Date: 2003-2004

Position: Environmental Management Consultant
Client: Roads Department, Lusaka
Project: Road Sector Investment Programme (ROAD-SIP) (funded by EC)
Assignment: Final Environmental Impact Evaluation Study of the Rehabilitation of the Kabwe-Kapiri Mposhi and Chisamba Roads

Date: 2003-2004
Position: EIA/Environmental Management Consultant (Team Leader)
Client: Roads Department, Lusaka
Project: Environmental Impact Assessment for Lusaka-Chirundu and Zimba-Livingstone Roads (funded by EU)
Assignment: Environmental Impact Assessment and Development of an Environmental Management and Monitoring Plan for Lusaka-Chirundu & Zimba-Livingstones Roads.

Date: 2004
Location: Pedicle Road, Congo DR
Position: Project Co-ordinator and EIA Consultant
Client: Roads Department
Project: Environmental of Pedicle road construction
Assignment: Undertaking environmental assessment of the pedicle road construction leading to the preparation of environmental project brief with mitigation measures

Date: 2004
Position: Environmental Management Consultant
Client: Roads Department, Lusaka
Project: Road Sector Programme Support (ROAD-SPS) (funded by DANIDA)
Assignment: Environmental Baseline Study of the Lusaka-Mongu Road Corridor

Date: 2001
Position: EIA Consultant
Client: Roads Department, Lusaka
Project: Road Sector Investment Programme (funded by DANIDA)
Assignment: Environmental Impact Assessment for Lusaka-Mongu Road and Development of an Environmental Management and Monitoring Plan.

Date: February 2008-April 2008
Location: Lusaka, Zambia
Position: Environmental Consultant
Client: UNDP/Ministry of Tourism, Environment & Natural Resources, Lusaka, Zambia
Project: Economic Impacts of Climate Change in Zambia
Assignment: Developing an Action Plan resulting from comprehensive analytical evaluation.

Date: 2007
Location: Lusaka
Position: Environmental Management Specialist
Client: Ministry of Tourism Environment and Natural Resources (MTENR) funded by FINIDA
Project: Repackaging the Environment and Natural Resources Programmes of the Fifth National Development Plan
Assignment: Development of the Woodfuel and Sustainable Forestry Management Programme and Institutional Capacity Building Programme for the MTENR.

Date: 2005
Location: Lusaka
Position: Environmental Management Specialist
Client: UNDP/Ministry of Tourism, Environment and Natural Resources
Project: Capacity Building on Trade and Environment
Assignment: Production of report outlining options on trade and environment issues impacting on market access, environmental sustainability, sustainable development and, in particular, poverty reduction in Zambia, to serve as an input into the regional study.

Date: 2007
Location: Mazabuka
Position: EIA/Environmental Management Specialist & Team Leader
Client: Zambia Sugar Plc
Project: Environmental Impact Assessment of Installation of Surface Fuel Tanks at Zambia Sugar Plc
Assignment: Environmental Impact Assessment and preparation of an Environmental Management and Monitoring Plan to mitigate adverse effects for installation of surface fuel tanks.

Date: 2005
Position: Project Director/Environmental Management Consultant
Client: Kitwe City Council/UN-Habitat
Project: Preparation of the City Environmental Profile for Kitwe (funded by UN-Habitat)
Assignment: Planning and managing all project activities, co-ordination of the team's work, guiding the study team on methods, techniques and survey of the environmental setting of the city and final preparation of the report.

Date: 2005
Position: Environmental Management Consultant
Client: Roads Department, Lusaka
Project: Road Sector Investment Programme (ROAD-SIP) (funded by EC)
Assignment: Final Environmental Impact Evaluation Study of the Rehabilitation of the Mongu-Kalabo Road

Date: 2004
Location: Kalulushi, Zambia
Position: EIA Project Consultant
Client: Thomro Investments Limited
Project: Environmental Assessment of Copper Processing Plant
Assignment: Preparation of an Environmental Project Brief for Artisanal Scale Copper Processing Plant in Kalulushi light Industrial Area and development of environmental management plan.

Date: 2004
Position: Environmental Management Consultant
Client: MLGH, (Ministry of Local Government and Housing), Lusaka
Project: Feasibility Study for the Improvement of the Feeder Road Network on the Copperbelt (funded by Arab Bank for Economic Development in Africa (BADEA))
Assignment: Environmental Assessment (EA) for the Copperbelt Feeder Roads covering all the ten Copperbelt towns namely: Ndola, Luanshya, Masaiti, Mpongwe, Kalulushi, Lufwanyama, Kitwe, Mufulira, Chingola and Chililabombwe.

Assignments with Swedish Geological/Thomro Investments Ltd JV (March 2004-May 2005):

Date: March 2004-May 2005
Location: Kitwe, Zambia
Position: Project Office Manager for Copperbelt Environment Project (CEMP II)
Client: ZCCM-IH, Kitwe, Zambia
Project: Development of consolidated environmental management plan phase II under the Copperbelt Environment Project [funded by NORDIC Development Fund/World Bank]
Assignment: Co-ordinating project activities, planning and budgeting. Water quality monitoring of downstream rivers and mining environmental impact analysis leading to the development of a Consolidated Environmental Management Plan for ZCCM-IH.

Assignments with Kaizen Consulting International:

Date: 2002-2003
Position: EIA Consultant
Client: Ministry of Local Government & Housing/Lusaka City Council
Project: Lusaka Solid Waste and Sanitation Management Project
Assignment: Environmental Impact Assessment for the proposed sanitary landfill for City of Lusaka and Development of an Environmental Management and Monitoring Plan.

Date: 2003
Position: Environmental Management Consultant
Client: MLGH, (Ministry of Local Government and Housing), Lusaka
Project: Mine Township Services Project (funded by World Bank)
Assignment: Environmental Assessment (EA) for the Mine Township Services Project (MTSP) in five former mine townships including Kafubu, Nkana and Mulonga Water and Sewerage Companies.

Date: 2004
Position: EIA/Environmental Management Consultant (Team Leader)
Client: Roads Department, Lusaka
Project: Environmental Impact Assessment for Chingola-Solwezi - Mwinilunga Road
Assignment: Environmental Impact Assessment and Development of an Environmental Management and Monitoring Plan for Chingola-Solwezi-Mwinilunga Road.

Date: 2001-2004
Location: Lusaka, Zambia
Position: Environmental Management and Policy Specialist
Client: Kaizen Consulting International
Project: Environmental Project Management
Assignment: Providing advisory services in the area of environment and sustainable development, including policy formulation and development of strategies for sound management of natural resources, water, air, wildlife, forests.

Date: 2003-2004
Location: Lusaka, Zambia
Position: Project Co-ordinator and Alien Invasive Species Consultant
Client: IUCN/Ministry of Environment
Project: Southern African Biodiversity Support Programme
Assignment: Collecting information that will lead to the development of a regional biodiversity information system and network of national experts on Alien Invasive Species (AIS)

Date: 2003
Location: Lusaka, Zambia
Position: EIA Consultant and Team Leader
Client: Meanwood Housing Development Corporation
Project: Development of Meanwood Housing Estate [funded by Meanwood]
Assignment: Commissioned an Environmental Impact Assessment (EIA) for the Meanwood Development Housing Estate in Chongwe

Date: 2001
Location: All Districts in Zambia
Position: Environmental Management Consultant
Client: Zambia Social Investment Fund (ZAMSIF)/Ministry of Finance and National Planning [funded by Worldbank]
Project: Mainstreaming Environment in Zambia Social Investments Fund (ZAMSIF) Project Cycle.
Assignment: Design and development of capacity building handbook for mainstreaming environment in ZAMSIF project cycle for community investment fund projects which included roads improvement, conservation farming, infrastructure and natural resources projects.

Participation in international conferences/workshops

- 2010 Oct 15-17** : Presented a paper to the **IHDP International Conference on Urbanisation and Global Environmental Change** in *Tempe, Arizona, USA*.
- 2002 Aug 26-Sep 4** : Attended the **United Nations World Summit on Sustainable Development** in *Johannesburg, South Africa*.
- 2001 Oct 16-20** : Attended the **Sixth Meeting of the International Network of Green Planners** under the theme "Partnerships for Sustainability: Practices and Principles Reviewed and New Strategic Alliances Explored" in *Vienna, Austria*.
- 2001 Oct 6-8** : Presented a paper to the **Open Meeting of the Human Dimensions of Global Environmental Change Research Committee** in *Rio de Janeiro, Brazil*.
- 2000 Dec 14-15** : Presented a paper at the **“National Workshop on Development of National Strategy for Waste Management in Zambia”** held at Pamodzi Hotel, in *Lusaka, Zambia*.
- 1999 Apr 12-15** : Presented a paper on “Why Environmental Protection should keep pace with Development” to the **UK-Zambia Co-operation Week** in *Lusaka, Zambia*.
- 1997 Nov 1-3** : Attended the **Fourth Roundtable Conference on “Cleaner Production”** in *Oslo, Norway*.
- 1996 Oct 23-26** : Attended the **Third Meeting of the International Network of Green Planners** in *San Jose, Costa Rica*.

- 1995 Nov 21-24* : Presented a Country report to the **UNEP Workshop on Cleaner and Safer Industrial Production in Eastern and Southern African Countries**, *Nairobi, Kenya*.
- 1995 Oct 23-27* : Presented a Paper on Environmental Monitoring, Auditing & Reporting at the **Workshop on Mining Environmental Legislation** in *Johannesburg, South Africa*.
- 1994 Dec 7-9* : Attended the **SADC-European Union Mining Forum**, held in *Lusaka, Zambia*.
- 1994 Sep 28-30* : Attended the Organisation for Economic Co-operation and Development (OECD) **Workshop on Development Assistance and Technology Co-operation for Cleaner Industrial Production in Developing Countries** held in *Hannover, German*.
- 1994 May 2-5* : Attended the **Western Africa Water & Environment Conference** held in *Accra, Ghana*.
- 1994 Mar 30-Apr 1* : Attended the **First meeting of the International Network of Green Planners** held in *Maastricht, Netherlands*.
- 1993 Dec 6-10* : Attended the **United Nations International Workshop on Environmental Management at Mining sites in Developing Countries** held in *Konkola, Zambia*.
- 1993 Nov 21-28* : Presented a paper on Water & Environmental Protection in Zambia to the **Advanced Seminar on Water & Environmental Protection in Africa** held at Kadoma Ranch Motel, *Kadoma, Zimbabwe*.
- 1993 Sep 21-24* : Presented a paper on wastewater disposal in Zambia to the **Southern Africa Water & Waste Water Conference** held in *Johannesburg, South Africa*.
- 1992 Dec 1-3* : Attended the **World Bank Workshop on Mining and the Environment in the Southern Africa Development Community (SADC) region** held in *Lusaka, Zambia*.
- 1992 Jun 29-30* : Attended the **World Bank Workshop on Natural Resources Use and Conservation** held in *Siavonga, Zambia*.

Certification:

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes myself, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.



Date: _____ Day / Month /
[Signature of staff member and authorized representative of the firm]
Year

Full name of staff member: JACOB CHISHIBA

CURRICULUM VITAE

Name : Josphat KONNIE

Date of Birth : 17th August, 1986

Nationality: : Zambian

Profession/Specialisation : Natural Resources

Email : josphat.konnie076@gmail.com

Mobile Phone : + (260)-976-613354/ +(260)-961-120026

Key Qualifications:

I hold a Bachelor of Science in Natural Resources Management from University of Zambia, With Concentrations in Environment and Development, Land Resources Survey, Environmental Hazards and Disasters, Ecology, Biostatistics, Environment and Natural Resources Management, Biodiversity, GIS & Remote Sensing, Freshwater Ecology, Natural Resources Economics, Fisheries Ecology, Hydrology and Climatology. I am currently working for Kaizen consulting International In the area of environment and sustainable development.

Key Education:

B.Sc. Natural Resources Management

Employment Record:

<i>Date: from (month/year) To (month/year)</i>	June, 2010
<i>Location</i>	Lusaka
<i>Company</i>	Kaizen Consulting International
<i>Position</i>	Natural Resources Specialist
<i>Description</i>	<ul style="list-style-type: none">➤ Participated In An Environmental Impact Assessment For The Proposed Inner Ring Road Project.➤ This Involved The Preparation of An Environmental and Social Management Framework and Resettlement Policy Framework

<i>Date: from (month/year) To (month/year)</i>	April, 2011
<i>Location</i>	Chipata, Eastern Province
<i>Company</i>	Kaizen Consulting International
<i>Position</i>	Natural Resources Specialist

<i>Description</i>	<ul style="list-style-type: none"> ➤ Environmental Project Brief For Proposed Fuel Service Station ➤ The Assignment Involved Assessment of The Potential Impacts of The Project and Development of Environmental and Social Management Plan
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<i>Date: from (month/year)</i> <i>To (month/year)</i>	May, 2011
<i>Location</i>	Chongwe
<i>Company</i>	Kaizen Consulting International
<i>Position</i>	Natural Resources Specialist
<i>Description</i>	<ul style="list-style-type: none"> ➤ Monitoring and Reporting on The Implementation and Progress of The approved Environmental Management Plan For The Borrow Pit Sites Exploited For Laterite Extraction Under The Rural Roads Improvement Project ➤ Assessment of Site Post Material Extraction Conditions

<i>Date: from (month/year)</i> <i>To (month/year)</i>	August, 2011
<i>Location</i>	Lusaka
<i>Company</i>	Kaizen Consulting International
<i>Position</i>	Natural Resources Specialist
<i>Description</i>	<ul style="list-style-type: none"> ➤ Phytosanitary Assessment of Imported Pesticides (Ficam wp and Fendona wp) Earmarked For Indoor Spraying. This Was a Project In Which RTI International, A United States Funded Programme In Zambia Was Supporting The Implementation of The National Malaria Control Programme ➤ Identification of The Potential Impacts of The Pesticides on Flora, Fauna, Air Quality, Aquatic Environment/Soils and Public Health

<i>Date: from (month/year)</i> <i>To (month/year)</i>	September, 2011
<i>Location</i>	Lusaka, Mongu, Mpika and Solwezi
<i>Company</i>	Kaizen Consulting International
<i>Position</i>	Natural Resources Specialist
<i>Description</i>	<ul style="list-style-type: none"> ➤ Environmental Project Brief For Proposed Construction of Government Petroleum Depots ➤ Assessment of The Impacts of The Project and

	Development of Environmental and Social Management Plans
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<i>Date: from (month/year)</i> <i>To (month/year)</i>	October, 2011
<i>Location</i>	Ndola
<i>Company</i>	Kaizen Consulting International
<i>Position</i>	Natural Resources Specialist
<i>Description</i>	<ul style="list-style-type: none"> ➤ Environmental Project Brief For Proposed Expansion of Brew House and Cellars ➤ Assessment of The Impacts of The Project and Development of Environmental and Social Management Plan

<i>Date: from (month/year)</i> <i>To (month/year)</i>	November, 2011
<i>Location</i>	Choma and Chongwe
<i>Company</i>	Kaizen Consulting International
<i>Position</i>	Natural Resources Specialist
<i>Description</i>	<ul style="list-style-type: none"> ➤ Mid Term Socio-Economic Monitoring of The Impacts of Rural Roads Improvements ➤ Monitoring of Agricultural Production /Size of cultivated plots, Market accessibility and Price of Farm Produce, Population Density and Settlement Patterns Along Improved Roads, Availability and Access To Rural Health Posts and Schools, Pupil Enrolment, Traffic Flow and Vehicle Types

<i>Date: from (month/year)</i> <i>To (month/year)</i>	February, 2012
<i>Location</i>	Mwenda-Mokambo, DRC
<i>Company</i>	Kaizen Consulting International
<i>Position</i>	Natural Resources Specialist
<i>Description</i>	<ul style="list-style-type: none"> ➤ Environmental Impact Assessment Of The Upgrading Of The Pedicle Road and Construction Of The Lubembe Bridge ➤ The Project Involved Preparation Of Environmental and Social Management Framework

<i>Date: from (month/year)</i> <i>To (month/year)</i>	March, 2012
<i>Location</i>	Kitwe
<i>Company</i>	Kaizen Consulting International
<i>Position</i>	Environmental Management Staff
<i>Description</i>	<ul style="list-style-type: none"> ➤ Environmental Project Brief For The Construction Of A Proposed Oryx Oil Fuel Service Station ➤ The Project Involved Assessment and Preparation Of An Environmental and Social Management Plan

<i>Date: from (month/year)</i> <i>To (month/year)</i>	March-Date
<i>Location</i>	Chingola-Lumwana
<i>Company</i>	Kaizen Consulting International
<i>Position</i>	Natural Resources Specialist
<i>Description</i>	<ul style="list-style-type: none"> ➤ Environmental Impact Assessment Of The Proposed Construction Of The Northwest Rail Line ➤ Preparation Of Environmental and Social Management Framework

Internship Record:

November, 2009:

Assistant Surface Hydrologist Attached With Ministry of Energy and Water Development. Duties included Geophysical Surveys for Ground Water Development and Surface Water Investigations i.e. Level Checks and Discharge Measurements/ Stream Flow Characterization

March, 2010

Fisheries Research Assistant (UNZA), The project was about "Catch and Effort Data Evaluation of The Kapenta Fishery of lake Kariba" Duties involved Fish length-Weight Characterisation, Laboratory Analysis, Classification and Transboundary Resource Management Issues.

July, 2010

Trainee Environmental Officer (Waste masters Limited), Participated In an Environmental Project Brief For a Proposed Water Treatment and Bottling Plant At Zambian Breweries Plc (SABMiller).

May-Dec, 2010

Trainee Environmental Officer (Waste masters Limited), Training Included Hazardous Waste Management Such As Oil Spill Cleaning, Handling, Sorting, Treatment, Transportation and Disposal of Expired Pharmaceutical Drugs and General Medical Waste, Used Oil, Expired Mobile Phones.

Research

2009

“Impacts of Hill Side Cultivation On Human Settlements In Chipata” A Case Of Magazine Township

2009

“Assessment Of Environmental, Socio-Economic and Socio-Cultural Aspects of Lutembwe Dam 1”, In Chipata Town, Eastern Province

International Seminars Attended

2010: Chinese Multi-national Corporations in Zambia, threat or gain? At Mulungushi International Conference Hall presented by Jesuit Center for theological reflections.

2009: Bio-fuels Cultivation and Processing in Zambia, presented by United Nations Development Programme (UNDP) at University of Zambia

2009: Climate Change Mitigation efforts in Zambia & the Copenhagen Conference of Parties, Presented by United Nations Development Programme (UNDP) at University of Zambia

Language Proficiency:

<i>Language</i>	<i>Spoken</i>	<i>Written</i>
English	Very Good	Very Good
Lozi	Very Good	Good
Bemba	Good	Good
Nyanja	Very Good	Good
Lamba	Fair	Poor

Certification:

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

[Signature of staff member and authorized representative of the firm]

Full Name:

CURRICULUM VITAE

JANE KIRSTEN TURPIE March 2015

Born: 17 March 1965, Durban, South Africa
Present occupations: Director: Anchor Environmental Consultants (Pty) Ltd.
Director: Environmental-Economics Policy Research Unit, School of Economics, University of Cape Town
Honorary Research Associate: South African Institute of Aquatic Biodiversity
Work address: 8 Steenberg House, Silverwood Close, Tokai 7945, South Africa.
Tel. (021) 701 3420 Fax (021) 701 5280
Email address jane@anchorenvironmental.co.za; jane.turpie@uct.ac.za
Memberships: European Association of Environmental and Resource Economists
South African Association of Professional Natural Scientists 400577/14

Summary profile

Dr Turpie has a background in Ecology and has also worked and taught in the applied fields of Conservation Biology and Resource Economics for the past 19 years. She is currently Director of Anchor Environmental Consultants and Deputy Director of the Environmental-Economics Policy Research Unit, School of Economics, University of Cape Town, which is part the international Environment for Development Initiative. Her interests and experience are broad and multidisciplinary, and she thrives on the integration of ecological and socio-economic aspects of natural resource management problems. Her work has included avifaunal studies, estuarine ecology, biodiversity and ecosystem health assessment, water and environmental flows, quantification and valuation of ecosystem services, socio-economic/livelihood assessments, analysing community dependence and pressures on natural resources, modelling ecological-economic systems (estuarine, river systems, wetlands, fynbos, thicket and woodland), incentive and financing systems for conservation, and integrating ecosystem services into conservation and development planning. She has supervised 39 postgraduate students, published 45 peer-reviewed papers in ecology and economics disciplines, written 12 book chapters, 5 books/published reports and at least 142 technical reports.

Projects undertaken include:

Period	Country	Client	Project, Tasks
2014-15	South Africa, Tanzania, Uganda	World Bank, through AECOM Washington	Project in progress: Promoting Green Urban Development in Africa: enhancing the relationship between urbanization, environmental assets and ecosystem services Position and tasks: Lead Economist, responsible for the main task, the ecosystem services assessment.
2014	South Africa	Western Cape Government	Project: EcoInvest – Priorities and opportunities for mobilising private sector investment in the Western Cape's natural capital. Position and tasks: Project leader. Rapid estimate of value of EI and losses due to degradation; assessment of financing options; private sector motivations; evaluation of existing initiatives; recommended government actions.
2013	South Africa	Conservation International	Project: An evaluation of wetland restoration as an ecosystem-based Adaptation option for climate change in Namaqualand Position and tasks: Intern supervisor.

Period	Country	Client	Project, Tasks
2013-14	Zambia	UNEP, through WCS New York	Project: The value of forests and role of REDD+ in a Green Economy in Zambia Position and tasks: Lead author, ecosystem services valuation specialist
2013-14	African continent	UNEP	Project: An evidence-based assessment of the investments required to meet the Aichi targets on the African continent. Position and tasks: Sole author.
2013-14	Lesotho	Lesotho Highlands Development Authority	Project: Biological monitoring of the catchments of the Katse and Mohale Dams: a comparison with the pre-construction baseline. Position and tasks: Project leader for large multidisciplinary team
2013-14	South Africa	iSimangaliso Wetland Park Authority & World Bank	Project: Analysis of options for restoring the connection between the St Lucia and Mfolozi estuaries. Position and tasks: Project co-leader, Socio-economics Task Leader; Ecological-economic modelling, development of an estuary version of the DRIFT scenario analysis tool; valuation of ecosystem services.
2012-13	Pakistan	Hagler-Bailey	Project: Environmental flow assessment for the proposed Neelum-Jhelum Hydropower dam. Position and tasks: Advisor for the socio-economics component.
2012	South Africa	SANParks	Project: Potential impacts of the proposed Addo MPA on commercial fisheries
2012	Global	DEFRA, UK	Project: Estimating the global cost of meeting the CBD Aichi Target 9 to control of alien invasive species by 2020.
2012	South Africa, Costa Rica & Tanzania	EfD Gothenberg University	Project: Marine protected areas and small-scale fishing behaviour: a comparative analysis between South Africa, Tanzania and Costa Rica.
2012	Namibia	Flora and Fauna International	Project: Biodiversity offset study for Uranium mining in Namibia. Position and tasks: Resource economist: Spatial valuation of ecosystem services in Erongo district.
2012	South Africa	CapeNature	Project: Determination of the ecological water reserve for the Uilkraals estuary. Position & tasks. Technical co-leader and collation of final report.
2011-12	South Africa	Fiscal & Financial Commission	Project: Vulnerability of rural communities to climate change in South Africa
2011-12	South Africa	Dept of Agric, Fisheries & Forestry	Project: Editing, stakeholder consultation and finalisation of the Sector Plan for the Department of Agriculture, Forestry and Fisheries
2011-12	South Africa	G7 Renewable Energies	Project: Preconstruction monitoring of avifauna at two proposed wind energy sites in the Karoo, South Africa Position and tasks: Project leader, study design and team management.
2010	Botswana	GEF/DWA/ Birdlife Bots	Project: Value of protected areas of the Makgadikgadi Pans and optimal models for co-management and a financing strategy. Position & tasks. Project leader. Desktop assessment using existing data.
2010	South Africa	SANBI	Project: National Estuary Conservation Plan Position & tasks. Project leader. Collating quantitative

Period	Country	Client	Project, Tasks
			biodiversity data, setting targets, Marxan analysis, workshops and finalisation.
2009-10	South Africa	Dept of Water Affairs	Project: Quantification, mapping and valuation of aquatic ecosystem services of the Olifants, Inkomati and Usutu to Mhlathuze Water Management Areas. Position & tasks. Project leader. Ecological and social surveys, data analysis, GIS-based modelling of ecological and economic parameters, spatial extrapolation.
2009-10	Namibia	UNDP	Project: Climate change vulnerability assessment for Namibia's protected area system Position & tasks. Project leader. Responsible for overall direction and resource economics aspects, including survey of protected area users.
2009-10	Namibia	SPAN	Project: Valuation and financial plan for Namibia's protected area system. Position & tasks. Co-author. Responsible for updating the earlier valuation study and producing a comprehensive financial plan.
2009	Global	UNDP	Project: Financial mechanisms for adaptation of fisheries to climate change Position & tasks. Lead author of book chapter.
2009	South Africa, Mozambique, Swaziland	Conservation International	Project: Maputland-Pondoland-Albany Hotspot Position & tasks. Preparation of a socio-economic assessment for the MPAH hotspot.
2009	South Africa	WRC	Project: Wetland Health and Integrity Programme Position & tasks. A protocol for quantification and valuation of wetland ecosystem services and for assessing the livelihood value of wetlands.
2008-9	South Africa	WWF-SA	Project: Ecology, value and management of the Kogelberg coast. Position & tasks. Project co-leader. Assessment of the economic value of the coast and implications of management changes on value, and overall editing of whole report.
2008-9	South Africa	UNDP	Project: National Capacity Self-Assessment – Biodiversity Position & tasks: Project leader. Assessment of SA's capacity to meet its commitments under the Biodiversity Convention, based on stakeholder meetings and workshops
2008	South Africa	South African National Biodiversity Institute	Project: Convention on Biodiversity: 4 th National Report Position & tasks: Project leader. Assessment of SA's progress in meeting its commitments under the Biodiversity Convention and assessment of the effectiveness of its strategies.
Dec 2006- Dec 2009	South Africa	Water Research Commission	Project: Wetland Health and Integrity Programme Position & tasks: Leader of Resource Economics component. Review of literature on biophysical and valuation aspects of wetland ecosystem services, undertaking valuation case studies for different types of services at different spatial scales, developing a protocol for assessment of value and socio-economic dependency
Dec	Zambia,	Worldfish	Project: Assessment of the social value of small-scale

Period	Country	Client	Project, Tasks
2006- Apr 2009	Malawi		fisheries. Position & tasks: Project leader for Southern Africa component. Responsible for Zambezi River Basin component of the study - analysis and write up, training workshops
Sep 2006- Feb 2007.	Namibia, Zambia	Conservation International	Project: Baseline socio-economic assessment and analysis of factors influencing household dependence on natural resources in the Kavango-Zambezi Transfrontier Conservation Area, and implications for conservation strategy. Position & tasks: Project leader. Survey design, analysis and write-up.
Apr 2006- Oct 2008	South Africa	Water Research Commission	Project: Development of an ecological-economic model of an estuary for use in management and water allocation decision-making. Position & tasks: Project leader. Socio-economic data collection and analysis, modelling workshops with physical and ecological specialists, completion of model, testing, write-up and manual.
Jun – Nov 2006	Lesotho	Government of Lesotho (through Southern Waters)	Project: Assessment of the loss of intangible value associated with rivers as a result of the Lesotho Highlands Development Project. Position & tasks: Technical team leader. Survey design, analysis and write up.
Dec 2005-8 - present.	Tanzania	IUCN - EARO	Project Environmental Flow Assessment of Pangani Basin, Tanzania. Position & tasks: Leader of Socio-Economics component. Development of a model for analysing the socio-economic aspects of the Environmental Flow Assessment. Collection and analysis of socio-economic data, development of spreadsheet model to estimate the change in aquatic ecosystem values associated with changes in environmental variables. Mentoring of Tanzanian specialists.
Oct 2005- Aug 2007.	South Africa	Cape Nature	Project: SA estuary biodiversity assessment and conservation planning. Position & tasks: Project leader. Development of a regional conservation plan for estuaries of the Cape based on conservation importance, ecosystem health and economic considerations; involved collation and analysis of biodiversity data, estimation of economic costs and benefits of conservation of each estuary, conservation planning using Marxan and GIS. Empirical data were collected for the study (ecological and economic).
Feb – Aug 2006	Botswana	IUCN – ROSA	Project: Valuation of the Okavango Delta, Botswana, responsible for direct use values and overall write-up. Position & tasks: Resource economist. Estimation of direct use values (Focus group and key informant discussions, household survey design, data analysis, tourism enterprise modelling), and write up of overall report including incorporation of sections contributed by other team members.
Apr 2004-	South Africa	Department of Water	Project: Development of the methodology for classification of water resources in South Africa, for use in

Period	Country	Client	Project, Tasks
Nov 2006.		Affairs and Forestry South Africa	water allocation decision-making. Position & tasks: Leader of Socio-Economics component. Development of a methodology for estimating aquatic ecosystem values and their relationships to ecosystem condition, and testing the approach on a pilot catchment. .
Dec 2004- Apr 2005.	South Africa	Dept of Environmental Affairs and Tourism, South Africa	Project: Economic assessment of the boat-based whale watching industry. Position & tasks: Project leader. Key informant interviews and collation and analysis of existing data, report write-up
Jul 2003- Jan 2005.	South Africa	Dept of Environmental Affairs and Tourism, South Africa	Project: Value of Knysna estuary Position & tasks: Project leader. Survey design and implementation, analysis and write-up
Aug 2004 – May 2005.	Namibia	UNDP	Project: Economic valuation and financing plan for Namibia’s protected area system Position & tasks: Project leader. Desktop study based on gathering and analysis of existing data
Aug – Dec 2004.	South Africa	Maluti-Drakensberg Transfrontier Conservation Project	Project: Development of a system of Payments for Ecosystem Services. Position & tasks: Resource economist. Description of service delivery and input into design of institutional arrangement for PES system.
Mar – Jun 2004.	South Africa	Dept of Environmental Affairs and Tourism	Project: Strategic Environmental Assessment of access to Off-road Vehicles in the coastal zone. Position & tasks: Resource economist. Help with design of the assessment criteria
Mar 2004.	Kenya, Uganda, Tanzania	IUCN-EARO	Project: Resource Economics research programme Position & tasks: Resource economist. Review of IUCN’s resource economics activities over the past 10 years and development of their future programme of activity in eastern Africa.
Oct – Dec 2003	Tanzania	IUCN - EARO	Project: Economic assessment of water allocation in the Pangani Basin, Tanzania. Position & tasks: Project leader. Survey design, Surveys of households and commercial enterprises throughout the basin, quantitative data analysis, analysis of policy and assessment of incentive options for water management. Management Experience: Management of entire project including a team of enumerators in the basin.
Oct 2003- Mar 2004.	South Africa	Dept of Water Affairs and Forestry	Project: EIA of displacement of trout by bass due to dam construction in the Natal Midlands, for Position & tasks: Resource economist. Surveys of trout industry and anglers.
Jan 2001- Dec 2003	South Africa	South African National Biodiversity Institute	Project: Conservation Farming Project. Position & tasks: Leader: Ecological-Economics Component. Responsible for advising ecological components and integrating these with economic components in a series of models to determine the ecological and economic consequences of alternative farming methods in four areas of South Africa.
Apr 2001-	South Africa	Water Research	Project: Eastern Cape Estuaries Management Programme Position & tasks: Conservation biologist/economist.

Period	Country	Client	Project, Tasks
Mar 2003		Commission (through Institute of Natural Resources)	Estuarine Biodiversity Protection Strategy project: involving assessing threats to estuarine biodiversity and the state of estuarine health and protection in South Africa and devising a strategy for the estuarine biodiversity protection.
Apr 2001- Mar 2003	South Africa	Water Research Commission (through University of Port Elizabeth).	Project: Improving the biodiversity importance rating of South African estuaries Position & tasks: SubProject leader. Compilation of detailed database on South African estuaries, detailed study on invertebrate fauna of 16 estuaries, detailed study of birds of a section of the coast, analysis of invertebrate biogeographic patterns, computation of importance indices.
Jun 2001- Oct 2002	Namibia	Afridev Consultants	Project: Environmental Impact Assessment of proposed agricultural developments in the eastern Caprivi, Namibia. Position & tasks: Resource Economist. Responsible for a detailed baseline assessment of the use and value of natural resources to rural communities, and the impact of the loss of floodplain areas to agricultural developments on household livelihoods.
Jan – Dec 2001	South Africa	Water Research Commission	Project: Ecological-economic assessment of the upper Olifants River basin wetlands. Position & tasks: Resource Economist and overall editor. Involved advising a team of physical and ecological scientists in their research on wetland functioning and assessment of the different types of values of the hundreds of wetlands in the area, largely a desktop study.
Sep 2000 to Feb 2001	Tanzania	UCT	Project: Impact of Integrated Conservation and Development Projects on local attitudes and behaviour around Udzungwa Mountains National Park, Tanzania. Position & tasks: Project supervisor. Accompany student into field, assistance with survey design, analysis and write-up
Sep 2000 to Feb 2001	Tanzania	UCT	Project: Value of the Ngezi forest – the last forest remnant on Pemba Island, Tanzania. Position & tasks: Project supervisor. Accompany student into field, assistance with survey design, analysis and write-up
Aug – Sep 2000	Tanzania	IUCN - EARO	Project: Valuation of natural resources of the Rufiji floodplain and delta in Tanzania for Environmental Management Plan. Position & tasks: Project leader. design, field work and management of field team, analysis, writeup
Jan 1998- Dec 1999	Zambia, Malawi, Mozambique, Namibia	IUCN - ROSA	Project: Economic valuation of the Zambezi Basin wetlands. Position & tasks: Project leader. Assessing use and value of natural resources and the policy situation in four major wetlands (Barotseland, eastern Caprivi, lower Shire and Zambezi Delta)
Mar – Nov 1998	Swaziland	Afridev Consultants	Project: EIA for the Maguga Dam, Swaziland. Position & tasks: Resource economics component, involving survey of affected households and quantitative analysis of resource use and value

Working experience

2015 -: Director, Environmental Economics Policy Research Unit, University of Cape Town.
2011 to 2014: Deputy Director, Environmental Economics Policy Research Unit, University of Cape Town.
2009 to present: Contract lecturer for Percy FitzPatrick Institute Conservation Biology MSc Coursework module on Environmental Economics and Policy.
2003 to present: Director, Anchor Environmental Consultants.
2003- 2009 Senior Lecturer at the Percy FitzPatrick Institute of African Ornithology (PFIAO), UCT;
1997 to 2002: Lecturer at the PFIAO and Zoology Department, UCT;
Jan to Dec 1996: Senior Scientific Officer at the PFIAO; primary research projects on economic aspects of coastal tourism and waterfowl conservation in Africa.
March 1994 to Dec 1995: Scientific Officer at the PFIAO, primarily in the fields of conservation biology and resource economics, with particular reference to protected areas.
January-December 1989: Research assistant to Dr P.A.R. Hockey (PFIAO), on a variety of ornithological projects.

Tertiary Education and Qualifications

- **Resource Economics short courses** with University of Cape Town (1994), with Robert Costanza (1995), and with the Swedish Beijer Institute of Ecological Economics (1997, 1998, 1998, 2001).
- **PhD** (Ornithology) - University of Cape Town 1990-1994
Thesis title: Comparative foraging ecology of two broad-ranging migrants, Grey Plover *Pluvialis squatarola* and Whimbrel *Numenius phaeopus* (Aves: Charadrii), in tropical and temperate latitudes of the western Indian Ocean.
- **BSc Honours** (Zoology) - University of Cape Town 1986
- **BSc** (Zoology) - University of Cape Town 1983-1985; Class medal for Marine ecology
- **Matriculated 1982** (Collegiate School for Girls, Port Elizabeth); Class prize for Standards 6 to 10; honours blazer for academic achievement, matric Geography prize. Matric overall aggregate: A: English (A), Afrikaans (C), Mathematics (B), Physical Science (A), Biology (A), Geography (B)

Publications - Economics

- TIBESIGWA, B., VISSER, M. & TURPIE, J. 2014. The impact of climate change on net revenue and food adequacy of subsistence farming households in South Africa. *Environment and Development Economics* **19**: 1-27.
- TURPIE, J. & GOSS, J. 2014. Potential impacts of alternative regulatory interventions on the recreational value of angling on the Breede River estuary, South Africa. *African Journal of Marine Science* **36**: 399-408.
- SOWMAN, M., SCOTT, D., GREEN, L., HARA, M., HAUCK, M., KIRSTEN, K., PATERSON, B., RAEMAEEKERS, S., SCOTT, K., SUNDE, J. & TURPIE, J. 2013. Shallow waters: social science research in the marine environment. *African Journal of Marine Science* **35**:385-402.
- LEWIS, S.E.F., TURPIE, J.K. & RYAN, P.G. 2012. Are African Penguins worth saving? The ecotourism value of the Boulders Beach colony. *African Journal of Marine Science*.
- BIGGS, D. TURPIE, J., FABRICIUS, C. & SPENCELEY, A. 2011. The value of avitourism for conservation and job creation—an analysis from South Africa. *Conservation and Society* **9**: 80-90.
- TURPIE, J.K. & LAMBERTH, S.J. 2010. Characteristics and value of the Thukela Banks crustacean and linefish fisheries, and the potential impacts of changes in river flow. *African Journal of Marine Science* **32**: 613–624.
- DOLLAR, E. S. J., NICOLSON, C. R., BROWN, C. A., TURPIE, J. K., JOUBERT, A. R. TURTON, A. R., GROBLER, D. F., PIENAAR, H. H., EWART-SMITH J. AND MANYAKA, S. M. 2010. Development of the South African Water Resource Classification System (WRCS): a tool towards the sustainable, equitable and efficient use of water resources in a developing country. *Water Policy* **12**: 479–499.
- NAPIER, V.R., TURPIE J.K. & CLARK B.M. 2009. Value and management of the subsistence fishery at Knysna Estuary, South Africa. *African Journal of Marine Science* **31**: 297–310.

- SCOVRONICK, N.C. & TURPIE, J.K. 2009. Is enhanced tourism a reasonable expectation for transboundary conservation? An evaluation of the Kgalagadi Transfrontier Park. *Environmental Conservation* 36: 149-156.
- LANNAS, K. S. M., & J. K. TURPIE. 2009. Valuing the provisioning services of wetlands: contrasting a rural wetland in Lesotho with a peri-urban wetland in South Africa. *Ecology and Society* 14(2): 18. [online] URL: <http://www.ecologyandsociety.org/vol14/iss2/art18/>
- TURPIE, J.K. 2008. Environmental and resource economics. Ch 2 in Environmental management in South Africa. Juta, Cape Town. (Book chapter)
- TURPIE, J.K. 2008. The valuation of riparian fisheries in southern and eastern Africa. Pp 107-146 in Neiland, A.E. and C. Béné (eds.) 2008. Tropical river fisheries valuation: background papers to a global synthesis. The WorldFish Center Studies and Reviews 1836, 290 pp. The WorldFish Center, Penang, Malaysia. (Book chapter)
- TURPIE, J.K., MARAIS, C. & BLIGNAUT, J. 2008. Evolution of a Payments for Ecosystem Services mechanism addressing both poverty and ecosystem service delivery in South Africa. *Ecological Economics* 65:788-798.
- TURPIE, J.K., O'CONNOR, T., MILLS, A. & ROBERTSON, H. 2007. The ecological and economic consequences of changing land use in the southern Drakensberg grasslands, South Africa. *Southern African Journal of Economic and Management Sciences* 10: 423- 443.
- DUGAN, P., SUGUNAN, V.V., WELCOMME, R.L., BENE, C., BRUMMETT, E., BEVERIDGE, M.C.M., ABBAN, K., AMARASINGHE, U., ARTHINGTON, A., BLIXT, M. CHIMATIRO, S., KATIHA, P., KING, J., KOLIDING, J. KHOA, N. & TURPIE, J.K. 2007. Inland fisheries and aquaculture. Pp. 459-484 in Molden, D. (ed.) Water for food, water for life: a comprehensive assessment of water management in agriculture. Earthscan, London. (Book chapter)
- TURPIE, J.K. SIHLOPE, N., CARTER, A. MASWIME, T. & HOSKING, S. 2007 Maximising the socio-economic benefits of estuaries through integrated planning and management: a rationale and protocol for incorporating and enhancing estuary values in planning and management In: Water Research Commission. Profiling estuary management in integrated development planning in South Africa, with particular reference to the Eastern Cape Province. WRC Report No. 1485/1/07. (Published report)
- MILLS, A.J., TURPIE, J.K., COWLING, R.M., MARAIS, C., KERLEY, G.I.H., LECHMERE-OERTEL, R.G., SIGWELA, A.M. & POWELL, M. 2007. Assessing costs, benefits and feasibility of subtropical thicket restoration in the Eastern Cape, South Africa. p179-187. in Aaronson, J., Milton, S.J., Blignaut, J. & Raven, P. (eds.) Restoring natural capital: science, business and practice. Island Press. (Book chapter)
- BLIGNAUT, J.N., MARAIS, C., AND TURPIE, J. 2006. Determining a charge for the clearing of invasive alien plant species to augment water supply in South Africa. *Water SA*. 33:27-34.
- TURPIE, J.K. & JOUBERT, A.R. 2004. The value of flower tourism on the Bokkeveld Plateau, a botanical hotspot around Nieuwoudtville in the Northern Cape, South Africa. *Development Southern Africa* 21: 645-662.
- FAIRBANKS, D.H.K., HUGHES, C.J. & TURPIE, J.K. 2004. Potential impact of viticulture expansion on habitat types in the Cape Floristic Region, South Africa. *Biodiversity and Conservation* 13: 1075 – 1100.
- TURPIE, J.K. 2004. The role of resource economics in the control of invasive alien plants in South Africa. *South African Journal of Science* 100: 87-93.
- TURPIE, J.K., WINKLER, H. & MIDGLEY, G. 2004. Economic impacts of climate change in South Africa: a preliminary analysis of unmitigated damage costs. Pp. 130 – 160 in: Blignaut, J.N. & de Wit, M.P. *Sustainable Options*. UCT Press. (Book chapter)
- TURPIE, J.K. & BARNES, J.I. 2003. Balancing ecology and economics in the multiple use of wetlands on communal lands. Proceedings VIIIth International Rangelands Congress, Durban, South Africa, 26 July – 1 August 2003. 1932-1941. (Conference proceedings)
- TURPIE, J.K. 2003. The existence value of biodiversity in South Africa: how interest, experience, knowledge, income and perceived level of threat influence local willingness to pay. *Ecological Economics* 46: 199-216
- LAMBERTH, S.J. & TURPIE, J.K. 2003. The role of estuaries in South African fisheries: economic importance and economic implications. *African Journal of Marine Science* 25: 131-157.
- TURPIE, J.K., HEYDENRYCH, B.J. & LAMBERTH, S.J. 2003. Economic value of terrestrial and marine biodiversity in the Cape Floristic Region: implications for defining effective and socially optimal conservation strategies. *Biological Conservation* 112: 233-251.

- PENCE, G.Q.K., TURPIE, J.K. & BOTHA, M.A. 2003. Evaluating combinations of on and off reserve conservation strategies for the Agulhas Plain, South Africa: a financial perspective. *Biological Conservation* **112**: 253-273.
- FRAZEE, S.R., COWLING, R.M., PRESSEY, R.L., TURPIE, J.K. & LINDENBERG, N. 2003 Estimating the costs of conserving a biodiversity hotspot: a case study of the Cape Floristic Region, South Africa. *Biological Conservation* **112**: 275-290.
- TURPIE, J.K. 2003. The economics of protected areas in South Africa. *African Wildlife* **57** (3): 34-37. (Popular article)
- RYAN, P.G. & TURPIE, J.K. 1995. Putting a price tag on rarity. *Birding in Southern Africa* **47** (3): 92-93. (Popular article)
- HUTCHINGS, K., LAMBERTH, S.J. & TURPIE, J.K. 2002. Socio-economic characteristics of gill and beach-seine fishers in the Western Cape, South Africa. *S.A. Journal of Marine Science* **24**: 243-262.
- HOGAN, R., TURPIE, J.K., MBIHA, E.R., SENKONDO, E.M.M., HAMERLYNCK, O. 2002. Socio-economic aspects of natural resource use in the Rufiji delta. Proceedings of the Second WIOMSA Symposium 22-26 October, Dar es Salaam, Tanzania. (Conference proceedings)
- TURPIE, J.K. & VAN ZYL, H. 2002. Valuing the environment in water resources management. Pp 85-110, in: Hirji, R., Johnson, P., Maro, P. & Matiza Chiuta, T. (eds) *Defining and mainstreaming environmental sustainability in water resources management in southern Africa*. SADC, IUCN, SARDC, World Bank: Maseru/Harare/Washington DC. (Book chapter)
- TURPIE, J.K. & HEYDENRYCH, B.H. 2002. Fynbos: a preliminary assessment of its status and economic value. Pp 73-116 in: Hassan, R.M. (Ed). *Accounting for stock and flow values of woody land resources: methods and results from South Africa*. CEEPA, University of Pretoria, Pretoria. (Book chapter)
- TURPIE, J.K. & HEYDENRYCH, B.H. 2000. Economic consequences of alien infestation of the Cape Floral Kingdom's Fynbos vegetation. pp 152-182 in Perrings, C., Williamson, M. & Dalmazzone, S. (eds) *The economics of biological invasions*. Cheltenham, U.K.: Edward Elgar. pp. 214-261. (Book chapter)
- MILLENIUM ECOSYSTEM ASSESSMENT. 2003. *Ecosystems and human well-being: A Framework for assessment*. Island Press, London. (too many authors to list). (Book)
- PALMER, R.W., TURPIE, J., MARNEWICK, G.C. & BATCHELOR, A.L. 2002. Ecological and economic evaluation of wetlands in the upper Olifants River catchment, South Africa. WRC Report No. 1162/1/02. (Published report)
- MOGAKA, H., SIMONS, G., TURPIE, J., EMERTON, L. & KARANJA, F. 2001. *Economic aspects of community involvement in sustainable forest management in eastern and southern Africa*. IUCN-EARO, Nairobi. (Book)
- TURPIE, J.K. & JOUBERT, A. 2001. The tourism value of rivers in Kruger National Park and impacts of a change in river quality. *Water SA* **27**: 387-398.
- BALLANCE, A., RYAN, P.G. & TURPIE, J.K. 2000. How much is a clean beach worth? The impact of litter on beach users in the Cape Peninsula, South Africa. *South African Journal of Science* **96**: 210-213.
- GRUNDY, I., TURPIE, J.K., JAGGER, P., WITKOWSKI, E., GUAMBE, I., SEMWAYO, D. & SOLOMON, A. 2000. Implications of co-management for benefits from natural resources for rural households in north-western Zimbabwe. *Ecological Economics* **33**: 369-381.
- TURPIE, J.K. & RYAN, P.G. 1999. What are birders worth? The value of birding in South Africa. *Africa: birds & birding* **4**: 64-68. (Popular article)
- HIGGINS, S.I., TURPIE, J.K., COSTANZA, R., COWLING, R.M., LE MAITRE, D.C., MARAIS, C. & MIDGLEY, G. 1997. An ecological economic simulation model of mountain fynbos ecosystems: dynamics, valuation and management. *Ecological Economics* **22**: 155-169.
- TURPIE, J.K. & SIEGFRIED, W.R. 1996. The conservation - economic imperative: securing the future of protected areas in South Africa. *Africa: environment and wildlife* **4** (3): 35-37. (Popular article)
- TURPIE, J.K. 1994. The billion dollar bird. *S.A. Commercial Marine* **3** (4): 23,30. (Popular article)

Publications – Ecology and conservation

- PITTOCK, J., FINLAYSON, M., ARTHINGTON, A. H., ROUX, D., MATTHEWS, J. H., BIGGS, H., HARRISON, I., BLOM, E., FLITCROFT, R., FROEND, R., HERMOSO, V., JUNK, W., KUMAR, R., LINKE, S., NEL, J., NUNES DA CUNHA, C., PATTNAIK, A., POLLARD, S., RAST, W., THIEME, M., TURAK, E., TURPIE, J., VAN NIEKERK, L., WILLEMS, D.

- AND VIERS, J. 2014. Managing freshwater, river, wetland and estuarine protected areas. In G. L. Worboys, M. Lockwood, A. Kothari, S. Feary and I. Pulsford (eds) *Protected Area Governance and Management*, pp. xx–xx. ANU Press, Canberra. (book chapter)
- CRAWFORD, R.J.M., R.M. RANDALL, P.A. WHITTINGTON, L. WALLER, B.M. DYER, D.G. ALLAN, C. FOX, A.P. MARTIN, L. UPFOLD, J. VISAGIE, S. BACHOO, M. BOWKER, C.T. DOWNS, R. FOX, J. HUISAMEN, A.B. MAKHADO, W.H. OOSTHUIZEN, P.G. RYAN, R.H. TAYLOR, J.K. TURPIE 2013. South Africa's coastal-breeding white-breasted cormorants: population trends, breeding season and movements, and diet. *African Journal of Marine Science* **35**: 473-490.
- TURPIE, J.K., TAYLOR, R.H., BOWKER, M.B. & FOX, C. 2013. Birds. In: Perissinotto, R., Stretch, D.D. & Taylor, R.H. (eds). *Ecology and conservation of estuarine ecosystems: Lake St Lucia as a global model*. Cambridge University Press. (book chapter)
- TEROERDE, A. & TURPIE, J.K. 2013. Influence of habitat structure and mouth dynamics on avifauna of intermittently-open estuaries: a study of four small South African estuaries. *Estuarine, Coastal and Shelf Science* **125**: 10-19.
- MOLLOY, P.P., BO, W., FORTES, M.D., PRESSEY, R.L., PRIMAVERA, J.H., SALOMON, A.K., TURPIE, J.K. & VINCENT, A.C.J. In press. Conservation of shallow-sea ecosystems. *Aquatic conservation*.
- TEROERDE, A. & TURPIE, J.K. 2012. Use of a small, intermittently-open estuary by waterbirds: a case study of the East Kleinemonde estuary, Eastern Cape, South Africa. *African Journal of Aquatic Science* **37**: 183-190.
- WHITFIELD, A.K., BATE, G.C., ADAMS, J.B., COWLEY, P.D., FRONEMAN, P.W., GAMA, P.T., STRYDOM, N.A., TALJAARD, S., THERON, A.K., TURPIE, J.K., VAN NIEKERK, L. AND WOOLDRIDGE, T.H.. 2012. A review of the ecology and management of temporarily open/closed estuaries in South Africa, with particular emphasis on river flow and mouth state as primary drivers of these systems. *African Journal of Marine Science* **34** (2).
- WHITFIELD, A.K., ADAMS, J.B., BATE, G.C., BEZUIDENHOUT, K., BORNMAN, T.G., COWLEY, P.D., FRONEMAN, P.W., GAMA, P.T., JAMES, N.V., MACKENZIE, B., RIDDIN, R., SNOW, G.C., STRYDOM, N.A., TALJAARD, S., TERORDE, A.I., THERON, A.K., TURPIE, J.K., VAN NIEKERK, L., VORWERK, P.D. AND WOOLDRIDGE, T.H. 2008. A multidisciplinary study of a small, temporarily open/closed South African estuary, with particular emphasis on the influence of mouth state on the ecology of the system. *Estuaries*. *African Journal of Marine Science* **30**: 453–473.
- TERORDE, A. & TURPIE, J.K. & COWLEY, P. 2007. Birds. In: Whitfield, A.K. & Bate, G.C. (eds) 2007. A review of information on temporarily open/closed estuaries in the warm and cool temperate biogeographic regions of South Africa, with particular emphasis on the influence of river flow on these systems. WRC Report no. 1581/1/07. (Published report)
- DRIVER, A., MAZE, K., ROUGET, M., LOMBARD, A.T., NEL, J., TURPIE, J.K., COWLING, R.M., DESMET, P., GOODMAN, P., HARRIS, J., JONAS, Z., REYERS, B., SINK, K. & STRAUSS, T. 2004. National Spatial Biodiversity Assessment 2004: priorities for biodiversity conservation in South Africa. *Strelitzia* **17**. SANBI, Pretoria. 44pp. (Published report)
- AWAD, A.A., GRIFFITHS, C.L. & TURPIE, J.K. 2002. Distribution of South African marine benthic invertebrates applied to the selection of priority conservation areas. *Diversity and Distributions* **8**: 129-145.
- TURPIE, J.K., ADAMS, J.B., JOUBERT, A., HARRISON, T.D., COLLOTY, B.M., MAREE, R.C., WHITFIELD, A.K., WOOLDRIDGE, T.H., LAMBERTH, S.J., TALJAARD, S. & VAN NIEKERK, L. 2002. Assessment of the conservation priority status of South African estuaries for use in management and water allocation. *Water SA*. **28**: 191-206.
- TURPIE, J.K., BECKLEY, L. & KATUA, S. 2000. Biogeography and the selection of priority areas for the conservation of South African coastal fishes. *Biological Conservation* **92**: 59-72.
- HOCKEY, P.A.R. & TURPIE, J.K. 1999. The ecology of estuarine birds. In: Allanson & Baird (eds) *Estuaries of South Africa*. Cambridge University Press. (Book chapter)
- HOCKEY, P.A.R. & TURPIE, J.K. 1999. Waders and their estuarine food supplies: are predatory impacts or predator behaviour the key to understanding carrying capacity? In: *Proceedings of the XXIX International Ornithological Congress, Durban, August 1999*. Compact Disk. (Conference proceedings)
- HOCKEY, P.A.R., TURPIE, J.K., PLAGANYI, E. & PHILLIPS, T.E. 1999. Scaling patterns in the foraging behaviour of sympatric plovers: effects of body size and diet. *Avian Biology* **29**.
- HOCKEY, P.A.R., TURPIE, J.K. & VELASQUEZ, C. 1998. What selective pressures have driven the evolution of deferred northward migration by juvenile waders? *Avian Biology* **29**: 325-330.

- DEAN, W.R.J, MILTON, S.J. & TURPIE, J.K. 1997. The conservation, ecology and evolution of birds - a southern perspective. *South African Journal of Science* **93**: 1-5.
- TURPIE, J.K. & HOCKEY, P.A.R. 1997. Adaptive variation in the foraging behaviour of Grey Plovers *Pluvialis squatarola* and Whimbrels *Numenius phaeopus*. *Ibis* **139**: 289-298.
- HOCKEY, P.A.R., PLAGANYI, E., TURPIE, J.K. & PHILLIPS, T.E. 1996. The foraging ecology of Crab Plovers in Mida Creek, Kenya. *Ostrich* **67**: 33-44.
- TURPIE, J.K. & HOCKEY, P.A.R. 1996. Foraging ecology and seasonal energy budgets of estuarine Grey Plovers *Pluvialis squatarola* and Whimbrels *Numenius phaeopus* at the southern tip of Africa *Ardea* **84**: 57-74.
- TURPIE, J.K. 1996. Superpilots: bird migration in Africa. *Africa: birds and birding* **1**: 61-67. (Popular article)
- TURPIE, J.K. 1995. Nonbreeding territoriality: causes and consequences of individual and seasonal variation in Grey Plover *Pluvialis squatarola* behaviour. *J. Anim. Ecol.* **64**: 429-438.
- TURPIE, J.K. 1995. Prioritizing South African estuaries for conservation: a practical example using waterbirds. *Biological Conservation* **74**: 175-185.
- TURPIE, J.K. 1994. Why do plovers have a stereotyped foraging behaviour? *Wader Study Group Bulletin* **75**: 39. (Popular article)
- TURPIE, J.K. 1994. Feathered pirates unmasked. *S.A. Commercial Marine* **3** (1): 22-24. (Popular article)
- TURPIE, J.K. & CROWE, T.M. 1994. Patterns of distribution, diversity and endemism of larger mammals in Africa. *S. Afr. J. Zool.* **29**: 19-32.
- TURPIE, J.K. 1993. Migrant visitors. *S.A. Commercial Marine* **2** (2): 21, 26. (Popular article)
- TURPIE, J.K. & HOCKEY, P.A.R. 1993. Comparative diurnal and nocturnal foraging behaviour and energy intake of Grey Plovers *Pluvialis squatarola* and Whimbrels *Numenius phaeopus*. *Ibis* **135**: 156-165.

Book reviews

- TURPIE, J.K. 2001. Tundra Plovers: the Eurasian, Pacific and American Golden Plovers and Grey Plover, by Ingvar Byrkjedal and DBA Thompson. *Wilson Bull.* **113**: 118-119.
- TURPIE, J.K. 1999. Wetland birds, habitat resources and conservation implications, by Milton W. Weller. *S. Afr. J. Zool.* **34**: 201.
- TURPIE, J.K. 1996. Bird Conservation: the science and the action, edited by J. Coulson & N.J. Crockford, *Ibis* **137** Supp 1, 1995. *Wader Study Group Bulletin* **80**: 20-21.
- TURPIE, J.K. 1993. The Ruff. *Birding in Southern Africa*.

Technical reports: Resource economics

- TURPIE, J., FORSYTHE, K. & LETLEY, G. 2015. Assessment of the impacts of compact versus sprawling urban development on ecosystem services in the Mossel Bay Municipality. Report to Palmer Development Group on behalf of Western Cape Provincial Government.
- TURPIE, J. & LETLEY, G. 2015. Socio-economics impact assessment for the proposed Batoka Gorge Hydropower facility. Anchor Environmental Consultants Report to ERM.
- TURPIE, J., FEIGENBAUM, T. & COUSINS, T. 2015. Analysis of alternatives to determine the most feasible solution to the hydrological issues of the Lake St Lucia estuarine system: socio-economic assessment. Report to iSimangaliso Wetland Park Authority. 300pp.
- TURPIE, J., MILLS, A., KONG, T. & TACON, C. 2014. A preliminary assessment of priorities and opportunities for mobilising private sector investment in the Western Cape's natural capital. Report submitted to Western Cape Government, South Africa. 207pp.
- TURPIE, J. WARR, B., & INGRAM, J.C. 2014. The economic value of Zambia's forest ecosystems and potential benefits of REDD+ in Green Economy transformation in Zambia. UNEP Report. 142pp.
- HUTCHINGS, K., CLARK, B. & TURPIE, J.K. 2014. Potential impact of the proposed reduction in minimum TAC on the South African small-pelagics fishery. Anchor Environmental report to the industry.
- TURPIE, J.K. 2014. Resource Requirements for meeting the Aichi Biodiversity Targets in Africa. Report UNEP-WCMC, UK for the CBD High-Level Panel on Global Assessment of Resources for Implementing the Strategic Plan for Biodiversity 2011-2020.

- TURPIE, J.K. & MARX, D. 2012. Economic value of the uranium mining landscape in Namibia. Unpublished report to Flora and Fauna International.
- TURPIE, J.K., HUTCHINGS, K., CLARK, B. & CLARKE, F. 2012. Potential impact of the proposed Addo Marine Protected Area on commercial fisheries. Anchor Environmental report to SANParks.
- TURPIE, J.K., JURK, C., KEITT, B. & HOLMES, N. 2012. Anticipated costs of meeting the Aichi Biodiversity Targets for 2020: Target 9 - Invasive Alien Species. Report to DEFRA, UK.
- VISSER, M, TIBESIGWA, B. & TURPIE, J. 2012. The impact of climate change on agricultural productivity. In Turpie, J.K. & Visser, M. The impact of climate change on rural areas in South Africa. Report to Fiscal and Financial Commission, Government of South Africa.
- TURPIE, J.K., MARX, D. & VISSER, M. 2012. Vulnerability to climate change: a sub-national assessment at the municipal scale. In Turpie, J.K. & Visser, M. The impact of climate change on rural areas in South Africa. Report to Fiscal and Financial Commission, Government of South Africa.
- TURPIE, J.K. & VISSER, M. 2012. Fiscal and financial measures for improving resilience to climate change in rural areas. In Turpie, J.K. & Visser, M. The impact of climate change on rural areas in South Africa. Report to Fiscal and Financial Commission, Government of South Africa.
- TURPIE, J. & CHESTERMAN, S. 2011. The value of estuaries in Northern KwaZulu-Natal with particular reference to the Mfolozi and St Lucia systems. In Bate, G.C., Whitefield, A.K. & Forbes, A.T. (eds.) *A review of studies on the Mfolozi estuary and associated flood plain, with emphasis on information required by management for future reconnection of the river to the St Lucia system*. Water Research Commission Report No. KV 255/10
- TURPIE, J.K., MIDGLEY, G., BROWN, C., BARNES, JI, PALLET, J. DESMET, P., TARR, J. & TARR, P. 2010. Climate change vulnerability and adaptation assessment for Namibia's biodiversity and protected area system. Ministry of Environment and Tourism, Namibia.
- TURPIE, J.K., BARNES, J.I., DE LONGCAMP, M. & PAXTON, M. 2010. Sustainable financing plan for Namibia's protected area system. Ministry of Environment and Tourism, Namibia.
- TURPIE, J.K., BARNES, J.I., LANGE, G.-M. & MARTIN, R. 2010. The economic value of Namibia's Protected Area System: a case for increased investment. Ministry of Environment and Tourism, Namibia.
- TURPIE, J.K. & BARNES, J.K. 2010. The use value of the Makgadikgadi pans, Botswana.
- TURPIE, J.K., ET AL. 2010. The nature and value of aquatic ecosystem services in the Olifants, Inkomati and Usutu to Mhlatuze Water Management Areas. Report for Department of Water Affairs. 362 pp.
- TURPIE, J.K. 2009. Socio-economic context of the Maputaland-Pondoland-Albany Hotspot and applicability of economic instruments for conservation. Report for Conservation International.
- TURPIE, J.K. CLARK, B.M. HUTCHINGS, K. ORR K.K. & DE WET, J. 2009. Ecology, value and management of the Kogelberg coast. Anchor Environmental report to WWF-SA. 160pp.
- TURPIE, J.K., LANNAS, K., SCOVRONICK, N. & LOUW, A. 2010. Wetland Valuation Vol I. Wetland ecosystem services and their valuation: a review of current understanding and practice. Wetland Health and Integrity Programme, Water Research Commission Report TT440/09, Pretoria. 115pp
- TURPIE, J.K. (ed) 2010. Wetland Valuation. Vol II. The valuation of provisioning, regulating and cultural services provided by wetlands: case studies from South Africa and Lesotho. Wetland Health and Integrity Programme, Water Research Commission Report TT441/09, Pretoria. 101pp
- TURPIE, J.K. 2010. Wetland Valuation. Vol III. The Wetland Livelihood Value Index: A tool for the assessment of the livelihood value of wetlands. Wetland Health and Integrity Programme, Water Research Commission Report TT442/09, Pretoria, 54pp.
- TURPIE, J.K. & KLEYNHANS, M. 2010. Wetland Valuation Vol IV. A protocol for the quantification and valuation of wetland ecosystem services. Wetland Health and Integrity Programme, Water Research Commission. Water Research Commission Report TT442/10, Pretoria, 66pp.
- TURPIE, J.K., ET AL. (in prep). A spatial assessment of the supply and value of aquatic ecosystem services in the Olifants, Inkomati and Usutu to Mhlatuze Water Management Areas. Report for DWAF.
- TURPIE, J.K. & DE WET, J. 2009. The recreational value of the Garden Route Coast, South Africa, and implications of changes in management. Anchor Environmental Consultants report to World Wide Fund for Nature – South Africa.

- TURPIE, J.K. & DE WET, J. 2009. The recreational value of the Kogelberg Coast, South Africa, and implications of changes in management. Anchor Environmental Consultants report to World Wide Fund for Nature – South Africa.
- TURPIE, J.K, MENAYAS, A., DURES, S., SHAW, J.M, MEEK, C., CORDINGLEY, J., HAMANN, M., MZUMARA, T., MUSVUUGWA, T., LOUW, A., BEWANA, A., QUAYLE, T. & DITLHOBOLO, T. 2008. *The nature, distribution and value of ecosystem services in South Africa*. Unpublished report (paper in prep). Percy FitzPatrick Institute, University of Cape Town.
- DE WET, J. & TURPIE, J.K. 2009. *South Africa's fourth national report to the Convention on Biological Diversity*. SANBI Report to CBD Secretariat.
- TURPIE, J.K. & DE WET, J. 2008. *South African National Capacity Self Assessment. Thematic Profile: Biodiversity*. Final report prepared for DEAT and UNDP.
- TURPIE, J.K., CLARK, B.M., COWLEY, P., BORNMAN, T & TERÖRDE, A. 2009. Integrated ecological-economic modelling as an estuarine management tool: a case study of the East Kleinemonde Estuary. Volume II. Model construction, evaluation and user manual. WRC Report No: 1679/2/08.
- TURPIE, J.K., JOUBERT, A.R., BABIKER, H., CHAUDHRY, J., CHILD, M., HEMPSON, T., HUMPHREY, G., JOSEPH, G., LA GRANGE, R., LIPSEY, M., MANN, G., OKES, N., PUTTICK J. & WISTEBAAR, T. 2008. Integrated ecological-economic modelling as an estuarine management tool: a case study of the East Kleinemonde Estuary. Volume I. The economic value of the East Kleinemonde Estuary and impacts of changes in freshwater inputs. WRC Report No: XXX
- TURPIE, J.K. & CLARK, B.M. 2007. The health status, conservation importance, and economic value of temperate South African estuaries and development of a regional conservation plan. Report to CapeNature
- TURPIE, J.K., CLARK, B.M. & HUTCHINGS, K. 2007. The economic value of Marine Protected Areas along the Garden Route Coast, South Africa, and implications of changes in size and management. Report to WWF-SA.
- TURPIE, J.K. & SCOVRONICK, N. 2007. Socio-economic assessment of the potential impact of a proposed rehabilitation and conservation strategy for wetlands in the highlands of Lesotho. Report to strategic environmental focus for Government of Lesotho. 52pp.
- SCOVRONICK, N., GORDON, H. & TURPIE, J.K. 2007. Socio-economic baseline survey of selected communities within the Kavango-Zambezi Transfrontier Conservation Area. Report to Conservation International.
- DOLLAR, E.S.J., BROWN, C.A., TURPIE, J.K., JOUBERT, A.R., NICOLSON, C.R. AND MANYAKA, S. 2006. The development of the Water Resource Classification System (WRCS). Volume 1. Overview and 7-step classification procedure. CSIR and Department of Water Affairs and Forestry, Pretoria, 70pp.
- TURPIE, J.K. SIHLOPE, N., CARTER, A. MASWIME, T. & HOSKING, S. 2007 Maximising the socio-economic benefits of estuaries through integrated planning and management: a rationale and protocol for incorporating and enhancing estuary values in planning and management. Appendix 1 in: Profiling estuary management in integrated development planning in South Africa with particular reference to the Eastern Cape Province. Water Research Commission Report No 1485/1/07.
- TURPIE, J.K., SCOVRONICK, N. & BROWN. C. 2006. Intangible resource losses and gains in Phase 1 areas of the Lesotho Highlands Water Project. Report to LHDA. 69 pp.
- TURPIE, J.K. 2006. *Kromme/Seekoei Catchments Reserve Determination Study – Technical Component. Socio-economics Report*. Report to Coastal & Environmental Services. CES Report no. RDM/ K90/ 00/CON/1105. 91pp.
- TURPIE, J.K., BARNES, J., ARNTZEN, J., NHERERA, B., LANGE, G-M & BUZWANI, B. 2006. *Economic value of the Okavango Delta, Botswana, and implications for management*. Report to the Okavango Delta Management Plan project, Government of Botswana.
- TURPIE, J.K., DOLLAR, E., GOLDIN, J., MULLINS, W. MALLORY, S., ROSSOUW, N., & JOUBERT, A. 2006. *Socio-economic guidelines for the 7-step classification procedure*. Contract report to the Department of Water Affairs and Forestry. CSIR.
- TURPIE, J.K., GOLDIN, J., LAMBERTH, S.J. & MULLINS, W.J. 2006. Socio-economics implications of changes in freshwater flows in the Olifants/Doring Catchment. J Report to Southern Waters/DWAF. DWAF Report No.
- JOUBERT, A., TURPIE, J., BROWN, C., MANYAKA, S. AND DOLLAR, E. 2006: The development of the Water Resource Classification System (WRCS). Volume 4. Decision-analysis (including the

- stakeholder engagement process) guidelines for the 7-step classification procedure. CSIR Report No., Department of Water Affairs and Forestry, Pretoria, 65pp
- TURPIE, J.K., CLARK, B., NAPIER, V., SAVY, C.E. & JOUBERT, A.R. 2004. The economic value of the Knysna estuary, South Africa. University of Cape Town. Unpublished report to Marine & Coastal Management, Department of Environmental Affairs and Tourism.
- TURPIE, J.K., SAVY, C., CLARK, B. & ATKINSON, L. 2005. *Boat-based whale watching in South Africa: an economic perspective*. Report to DEAT: Marine and Coastal Management.
- TURPIE, J.K. 2005. *The economic impact of the Off-Road Vehicle Ban: A Case study of the Greater St Lucia Wetland Park*. Report to the GSLWP Authority and DEAT: Marine and Coastal Management.
- TURPIE, J.K., LANGE, G.-M., MARTIN, R., DAVIES, R. & BARNES, J.I. 2005. *Namibia's protected areas :their economic worth and feasibility of their financing*. DEA Research Discussion Paper no. 73. 32pp.
- TURPIE, J.K., LANGE, G.-M., MARTIN, R., DAVIES, R. & BARNES, J.I. 2004. *Economic value and financing of Namibia's protected areas*. Report to UNDP. 121pp.
- TURPIE, J.K. 2004. *Ecosystem services supplied by the Maloti-Drakensberg Bioregion*. Report to FutureWorks for the Maloti Drakensberg Transfrontier Conservation and Development Programme.
- TURPIE, J.K. 2004. *Report on ecosystem service trading in the region*. Report to FutureWorks for the Maloti Drakensberg Transfrontier Conservation and Development Programme.
- SAVY, C.E. & TURPIE, J.K. 2004. *Payments for Ecosystem Services: a review of existing programmes and payment systems*. Report to FutureWorks for the Maloti Drakensberg Transfrontier Conservation and Development Programme.
- TURPIE, J.K., LAMBERTH, S.J., ALLETSON, J., MKHIZE, S. & SAVY, C. 2004. Socio-economic study of trout fishing and impact of bass invasion in the Upper Mooi River, above the Inchbrakie Falls, KwaZulu-Natal. Report to IWR for DWAF.
- TURPIE, J.K. 2004. *Evaluation and further development of the biodiversity economics component of IUCN's Eastern Africa Regional Programme*. Report to IUCN EARO.
- TURPIE, J.K., NGAGA, Y. & KARANJA, F. 2003. *A preliminary economic assessment of water resources of the Pangani River Basin, Tanzania: economic value, incentives for sustainable use and mechanisms for financing management*. Report to IUCN EARO. 96pp.
- TURPIE, J.K. 2003. *An ecological-economic appraisal of conservation on commercial farm land in four areas of South Africa*. Final report of the Ecological-Economics Research Component of the Conservation Farming Project. Report to National Botanical Institute. 225pp.
- TURPIE, J.K. (ed) 2003. *Investigation into the provision of a fish barrier on the upper Mooi River and the related socio-economic study*. Report to DWAF.
- TURPIE, J.K. 2003. *The valuation of riparian fisheries in southern and eastern Africa*. Report to ICLARM. 36pp.
- TURPIE, J.K. 2003. *Review of the GAUTRAIN EIA, with particular reference to the environmental economics component*. Report to Department of Agriculture.
- TURPIE, J.K. & EGOH, B. 2003. *Contribution of natural resources to rural livelihoods around Lake Liambezi and Bukalo Channel, eastern Caprivi and impacts of proposed agricultural developments and artificial recharge of the lake*. Report to Afridev, for the Government of Namibia. 89pp.
- TURPIE, J.K. 2002. *Relationship between rural communities and the natural environment in the vicinity of Lake Liambezi, eastern Caprivi, Namibia*. Draft Report to Afridev.
- TURPIE, J.K., WINKLER, H., SPALDING-FECHER, R., & MIDGLEY, G. 2001. *Economic impacts of climate change in South Africa: a preliminary analysis of unmitigated damage costs*. Report to Joint Centre for Political and Economic Studies, USAID.
- TURPIE, J.K. 2001. *The existence value of South Africa's natural heritage and implications of its loss through climate change - a Western Cape perspective*. Report to Joint Centre for Political and Economic Studies, USAID.
- TURPIE, J., JOUBERT, A., VAN ZYL, H., HARDING, B. & LEIMAN, A. 2001. *Valuation of open space in the Cape Metropolitan Area. A pilot study to demonstrate the application of environmental and resource economics methods for the assessment of open space values in two case study areas: Metro South and Metro South-east*. Report to the City of Cape Town. 104pp.

- MARAIS, C. TURPIE, J., MULLINS, D., CONRADIE, B., KHAN, A., GOLDIN, J., VAN ZYL, H., GROBBELAAR, E., VINK, N. & NDZINGE, V. 2001. *A cost benefit analysis framework for the national working for water programme*. Report to Working for Water.
- MANDER, M, TURPIE, JK AND LAMBERTH, SJ 2001. Decision support in estuary management: A role for economics. Scottsville: Institute of Natural Resources.
- LAMBERTH, S.J. & TURPIE, J.K. 2001. *The role of estuaries in South African fisheries: economic importance and economic implications*. Report to Institute of Natural Resources.
- TURPIE, J.K. 2000. *The use and economic value of natural resources of the Rufiji River floodplain and delta, Tanzania*. Report to Rufiji Environmental Management Project and IUCN East African Regional Office.
- TURPIE, J.K. 2000. *Functions and value of the Cape Metropolitan Open Space System*. Report to Common Ground Consulting.
- TURPIE, J.K. & JOUBERT, A.R. 2000. *The tourism value of rivers in and adjacent to the Kruger National Park, and impacts of a change in river quality*. Case study for the incorporation of economics into water reserve determination. Report to Institute of Natural Resources.
- TURPIE, JK, JOUBERT, AR & MANDER, M. 2000. *Framework and methodology for incorporation of economics into Resource Directed Measures and the strategic adaptive management of water resources in South Africa*. Report to the Institute of Natural Resources and Water Research Commission.
- MOGAKA, H., SIMONS, G., TURPIE, J. & EMERTON, L. 2000. *Economic aspects of community involvement in sustainable forest management in eastern and southern Africa*. IUCN-EARO Report.
- TURPIE, J.K. 2000. *Economic and financial incentives for enhanced community involvement in sustainable forest management in Angola, Namibia, South Africa and Zimbabwe*. Report to IUCN EARO, Nairobi.
- TURPIE, J.K. 1999. *The economic value of natural resources in the Cape Floristic Region: a preliminary overview*. Report to CSIR Environmentek.
- TURPIE, J.K & VAN ZYL, H. 1999. Valuing the environment in water resource management. Chapter 2 in *The sustainable management of aquatic resources in Southern Africa*. World Bank & IUCN..
- TURPIE, J.K., SMITH, B.S., EMERTON, L.E., & BARNES, J. 1999. *Economic value of the Zambezi Basin wetlands*. Report to IUCN-ROSA, Harare. 205pp.
- TURPIE, J.K. & RYAN, P.G. 1998. *The nature and value of birding in South Africa*. Report to BirdLife South Africa.
- TURPIE, J.K., SMITH, B.S., EMERTON, L.E., & BARNES, J. 1999. *Economic value of the Zambezi Basin wetlands*. Report to IUCN-ROSA, Harare. 346pp.
- TURPIE, J.K. & ALBERTS, T. 1998. *Environmental- and resource-economic impacts of the construction of Maguga Dam, Swaziland*. Report to Afridev.
- HEYDENRYCH, B. & TURPIE, J.K. 1997. *Accounting for natural resources in South Africa: A preliminary assessment of Fynbos stocks, yields and values in the western cape*. Unpublished report to EENESA & LAPC.
- TURPIE, J.K. 1996. (Editor). *The creation of conditions and incentives that support the conservation and sustainable use of biological diversity*. Proceedings of a workshop held in Cape Town on 5 August 1996. Unpublished report, 20pp.
- TURPIE, J.K. 1996. *Preliminary economic evaluation of De Hoop Nature Reserve*. Report to Cape Nature Conservation. 80pp

Reports: Ecology & Conservation

- BARKER, N., FORSYTHE, K., CLARK, V.R., RAMATLA, S., KHEEKHE, M., DOLD, A., KOBISI, K., NORMAN, Y. & TURPIE, J.K. 2014. Flora of the Katse Dam catchment. Specialist report for Contract 1273: Biological Resources Monitoring within Phase 1 of the LHWP Catchments 2013-14. Report no. AEC/14/12 submitted by Anchor Environmental Consultants to the Lesotho Highlands Development Authority.
- BARKER, N., FORSYTHE, K., CLARK, V.R., RAMATLA, S., KHEEKHE, M., DOLD, A., KOBISI, K., NORMAN, Y. & TURPIE, J.K. 2014. Flora of the Mohale Dam catchment. Specialist report for Contract 1273: Biological Resources Monitoring within Phase 1 of the LHWP Catchments 2013-14. Report no.

- AEC/14/12 submitted by Anchor Environmental Consultants to the Lesotho Highlands Development Authority.
- TURPIE, J., FORSYTHE, K, BENN, G., & THOMSON, M. 2014. Katse Dam catchment land cover change analysis 1991-2013. Specialist report for Contract 1273: Biological Resources Monitoring within Phase 1 of the LHWP Catchments 2013-14. Report no. AEC/14/12 submitted by Anchor Environmental Consultants to the Lesotho Highlands Development Authority
- TURPIE, J., FORSYTHE, K., BENN, G. & THOMSON, M. 2014. Mohale Dam catchment land cover change analysis 1991-2013. Specialist report for Contract 1273: Biological Resources Monitoring within Phase 1 of the LHWP Catchments 2013-14. Report no. AEC/14/12 submitted by Anchor Environmental Consultants to the Lesotho Highlands Development Authority
- TURPIE, J., BARKER, N., CLARK, B., DIEDERICKS, G., MARNEWECK, G., ALLAN, D. HARVEY, J., AVENANT, N & FORSYTHE, K. 2014. State of the Katse Dam catchment. Synthesis report for Contract 1273: Biological Resources Monitoring within Phase 1 of the LHWP Catchments 2013-14. Report no. AEC/14/12 submitted by Anchor Environmental Consultants to the Lesotho Highlands Development Authority.
- TURPIE, J., BARKER, N., CLARK, B., DIEDERICKS, G., MARNEWECK, G., ALLAN, D. HARVEY, J., AVENANT, N & FORSYTHE, K. 2014. State of the Mohale Dam catchment. Synthesis report for Contract 1273: Biological Resources Monitoring within Phase 1 of the LHWP Catchments 2013-14. Report no. AEC/14/12 submitted by Anchor Environmental Consultants to the Lesotho Highlands Development Authority
- TURPIE, JK, TALJAARD, S., ADAMS, J., VAN NIEKERK, L., FORBES, N., WESTON, B. HUIZINGA, P., WHITFIELD, A. 2012. Methods for the determination of the Ecological Reserve for estuaries. Version 3. Water Research Commission and Department of Water Affairs, Pretoria. WRC Report No. 1930/2/12.
- TURPIE, J.K., TALJAARD, S., VAN NIEKERK, L., ADAMS, J., WOOLDRIDGE, T., CYRUS, D., CLARK, B. & FORBES, N. 2012. The Estuary Health Index: a standardised metric for use in estuary management and the determination of ecological water requirements. WRC Report No. 1930/1/12
- B.M. CLARK, J.K. TURPIE, S. MALLORY, L. VAN NIEKERK, S. TALJAARD, J.B. ADAMS AND A. BICCARD. 2012. Determination of the ecological reserve for the Uilkraals estuary. Anchor Environmental Report to Cape Nature.
- TURPIE, J.K., PORTER, S. & SIMMONS, R. 2012. Preconstruction avifaunal monitoring report for the development of the Witberg Wind Energy Facility. Report by Anchor Environmental Consultants to G7 Renewable Energies.
- TURPIE, J.K., PORTER, S. & SIMMONS, R. 2012. Preconstruction avifaunal monitoring report for the development of the Klawer Wind Energy Facility. Report by Anchor Environmental Consultants to G7 Renewable Energies.
- VAN NIEKERK, L. & TURPIE, J.K. (EDS) 2012. National Biodiversity Assessment for South African Estuaries. Report to South African National Biodiversity Institute.
- TURPIE, J.K., WILSON, G. & VAN NIEKERK, L. 2011. Biodiversity plan for South African Estuaries. Report to South African National Biodiversity Institute.
- CLARK, B.M., TURPIE, J.K., HUTCHINGS, K., ORR, K.K. & DE WET, J. 2009. Ecology, value and management of the Kogelberg coast. Report by Anchor Environmental Consultants to World Wide Fund for Nature – South Africa. 157 pp.
- TURPIE, J.K. & CLARK, B.M. 2007. The health status, conservation importance, and economic value of temperate South African estuaries and development of a regional conservation plan. Report to CapeNature.
- DOLLAR, E.S.J., BROWN, C.A., TURPIE, J.K., JOUBERT, A.R., NICOLSON, C.R. AND MANYAKA, S. 2006: The development of the Water Resource Classification System (WRCS). Volume 1. Overview and 7-step classification procedure. CSIR Report No., Department of Water Affairs and Forestry, Pretoria, 70pp
- TURPIE, J.K. 2005. *Priority estuaries for conservation on the Wild Coast, South Africa*. Report to CSIR for the Wild Coast Conservation and Sustainable Development Project. 14pp.
- TURPIE, J.K. 2005. *Birds of the Kromme River estuary*. Report to CES for the Kromme-Seekoei RDM Study.
- TURPIE, J.K. 2004. *South African Spatial Biodiversity Assessment, Technical Report Vol 3: Estuary component*. DEAT: SANBI.

- TURPIE, J.K., FOX, C., TAYLOR, R. & CYRUS, D. 2004. *Birds of St Lucia estuary and impacts of a change in freshwater inputs*. Report to CSIR Environmentek.
- TURPIE, J.K. 2004. Current status of estuaries, their protection and threats to their biodiversity, proposed goals for conservation and guidelines for a strategy for the protection of estuarine biodiversity. In: Breen, C.M., Adams, J., Batchelor, A., Cowley, P., Marneweck, G., McGwynne, McKenzie, M., Bgulube, P., Paterson, A., Sihlophe, N., Taljaard, S., Turpie, J., Uys, A.C., van Niekerk, L., Wood, A., Lamberth, S., Boyd, A. & Morant, P. *Protocols contributing to the management of estuaries in South Africa, with a particular emphasis on the Eastern Cape Province. Vol. II. Eastern Cape Estuaries Management Research Programme*. WRC Report No. 1246/1/04.
- TURPIE, J.K. 2004. *Birds of the Berg River estuary*. Initialisation report for the Berg River monitoring programme. Report to DWAF.
- TURPIE, J.K., CLARK, B., KNOX, D., MARTIN, P., PEMBERTON, C. & SAVY, C. 2004. *Improving the biodiversity rating of South African estuaries*. Vol 1. Contributions to information requirements for the implementation of resource directed Measures for estuaries. WRC Report no. 1247/1/04. 121pp.
- TALJAARD, S., ADAMS, J. & TURPIE, J.K. 2003. *Methodology for the determination of the preliminary ecological reserve for estuaries*. Department of Water Affairs and Forestry, Republic of South Africa.
- TURPIE, J.K. 2003. *Goals and guidelines for a strategy for the protection of biodiversity in Eastern Cape estuaries*. Biodiversity protection subproject of the Eastern Cape Estuaries Management Programme, Report 3, Institute of Natural Resources.
- TALJAARD, S, ADAMS, J B, TURPIE, J K, VAN NIEKERK, L, BATE, G, CYRUS, D, HUIZINGA, P, LAMBERTH, S, WESTON, B. 2003. *Methodology for the Determination of the Preliminary Ecological Reserve for Estuaries*. Version 2. Department of Water Affairs and Forestry, Pretoria.
- CLARK, B., TURPIE, J.K. & NGESI, K. 2003. *Review of international strategies for conservation of estuarine biodiversity*. Biodiversity protection subproject of the Eastern Cape Estuaries Management Programme, Report 2, Submitted to Institute of Natural Resources.
- TURPIE, J.K. 2003. *The current state of protection and health of estuarine biodiversity in South Africa, with emphasis on Eastern Cape estuaries*. Biodiversity protection subproject of the Eastern Cape Estuaries Management Programme, Report 1, Submitted to Institute of Natural Resources.
- TURPIE, J.K. 2002. *The birds of the Transkei Coast*. Unpublished report to Water Research Commission.
- TURPIE, J.K. 2002. *The birds of Wildevoelvllei: an analysis of 16 years of monthly count data*. Unpublished report, Southern Waters. Report to City of Cape Town.
- TURPIE, J.K. 2002. *Avifaunal assessment of Lake Michelle Wetland, Noordhoek*. Unpublished report, Southern Waters. Report to City of Cape Town.
- TURPIE, J.K. 2001. *Breede River Estuary EFR/RDM study – specialist report on Avifauna*. Report to CSIR, Environmentek.
- TURPIE, J.K. & LLOYD, P. 2001. *Dynamics and ecological importance of the southern Noordhoek Beach lagoon, with reference to management of Wildevoelvllei*. Unpublished report, Southern Waters. Report to City of Cape Town.
- TURPIE, J.K. 2000. *Classification and prioritisation of South African estuaries on the basis of health and conservation priority status for determination of the estuarine water reserve*. Report to DWAF.
- TURPIE, J.K. & LOVE, V.C. 2000. *Avifauna and human disturbance on and around Thesen Island, Knysna estuary: implications for the island's marina development and management plan*. Report to Chris Mulder & Associates.
- TURPIE, J.K. 1999. *Assessing estuarine integrity and conservation priority status in South Africa: a prerequisite for planning decisions*. Report to DWAF and WRC, 38pp.
- TURPIE, J.K. 1999. *Diep river management plan: avifauna*. Report to Ninham Shand.
- TURPIE, J.K & WILLIAMS, A.J. 1999. *Thesen Island Environmental Management Plan: specialist input on avifaunal aspects*. Report to the CSIR Environmentek, 12pp.
- TURPIE, J.K. 1999. *Comment on the effect of the proposed diversion of water flow into the Westlake wetlands on avifauna*. Report to Southern Waters, 6pp.
- TURPIE, J.K. 1999. *Birds of the lower Hopies River, Hawston*. Report to Southern Waters, 6pp.

- TURPIE, J.K. 1998. *A preliminary assessment of the Monwabisi coastal dune area as a bird habitat*. Report to MCA Urban and Environmental Planners, 5pp.
- TURPIE, J.K. 1998. *Commercialisation of Milnerton Tankfarm: impacts of proposed pipeline routings on avifauna*. Report to COASTEC, 4pp.
- TURPIE, J.K. 1998. *Proposed development of a visitor centre at Rietvlei: impacts on avifauna*. Report to the CSIR, 19pp.
- TURPIE, J.K. & COHEN, C. 1998. *Proposed rezoning of Kenilworth Racecourse: avifaunal study*. Report to Doug Jeffery, 16pp.
- TURPIE, J.K. 1998. *Potential impacts of altered river flows on the birds of the Palmiet River estuary*. Report to the CSIR, 10pp.
- TURPIE, J.K. & MARTIN, A.P. 1998. *Birds of the Swartkops estuary: past and present*. Report to the CSIR.
- TURPIE, J.K. 1997. *Potential impacts of proposed dam and irrigation schemes on the birds of the Olifants River estuary: a preliminary desktop study*. Report to CSIR, 14pp.
- TURPIE, J.K. 1996. *Potential impacts of the proposed Caledon casino development on avifauna and recommendations for optimising bird habitat along the Baths River*. Report to Planning Partnership, 8pp.
- TURPIE, J.K. 1996. *Habitat preferences of waterbirds in the southwestern Cape, with particular reference to man-made wetlands and birds of conservation importance on the Cape Flats*. Unpublished report to Southern Waters, 15pp.
- TURPIE, J.K. 1996. *An assessment of alternative locations on the West Coast for Eskom's proposed Omega substation in terms of the potential impacts on bird populations*. Unpublished report to Ninham Shand.
- TURPIE, J.K. 1996. *Guidelines for the creation of bird habitats within Century City's main water feature at Blouvillei*. Unpublished report to CSIR, 4pp.
- TURPIE, J.K. 1996. *Specialist study of the avifauna of Blouvillei*. Unpublished report to CSIR, 20pp.
- TURPIE, J.K. 1995. *Thesen Island Environmental Impact Study: Specialist report on the avifauna*. Unpublished report to CSIR, 31pp.
- TURPIE, J.K. 1995. *Preliminary ornithological assessment of the Dreyersdal wetlands, erf 4161 Constantia*. Unpublished report to Ninham Shand, 8 pp.
- TURPIE, J.K. 1995. *Tableview Mall extension ecological report: impact of the proposed access road on wetland avifauna*. Unpublished report to Ninham Shand, 13 pp.
- TURPIE, J.K. & BROOKE, R.K. 1994. *Trends in the publication record of the Percy FitzPatrick Institute of African Ornithology, 1960 - 1993*. Unpublished report, 10pp.
- TURPIE, J.K. 1994. *A methodology for prioritizing South African estuaries for conservation*. Unpublished report to Quin Olën & Associates, 27pp.
- TURPIE, J.K. 1994. *The biological value of the lower reaches of the Black River and adjacent wetlands, and consequent management imperatives*. Unpublished report to the Cape Town City Planner's Department, 36pp.
- BROWN, C., JENKINS, A. & TURPIE, J.K. 1993. *Environmental survey to determine priority areas for conservation, community use and development in the west coast urban structure plan*. Unpublished report to the Botanical Society of South Africa, 28pp.

Teaching

- 2012 Taught part of a 2-week resource economics course in Kasese, Uganda, June.
- 2012 Taught part of a 3 week course on the economics of climate change at the University of Cape Town.
- 1995 to present Intensive one-month lecture module in Environmental and Resource Economics to MSc Conservation Biology students, including project work on River flow into Kruger National Park, value of biodiversity attributes to ecotourism in Hluhluwe Game Reserve, enterprise development for financial self-sufficiency in De Hoop Nature Reserve, costs and benefits of establishment of the proposed Agulhas Plain National Park, development of the Cape Peninsula National Park, and ecological-economic modelling of the Barotse Floodplain, Zambia.
- 2004 Resource economics module for Applied Marine Science MSc course.
- 2004-8 Resource economics lectures for Applied Ecology 2nd year course.

- 1998 - 2001 Co-leader of a three-week Zoology III field course in Behavioural Ecology at De Hoop Nature Reserve.
- 1997-9 Lectured a three-week course in Conservation Biology to second year Zoology students.
- 1995-9 Led discussion groups on conservation biology topics to 2nd Year Zoology and Zoology Honours classes respectively
- 1996 Lectured Environmental Economics to Cape Technikon 4th year Nature Conservation students.
- 1995-8 Group leader and/or project leader on the Zoology II field camp at Langebaan.
- 1984-6 Demonstrated Zoology I, II & III Practicals
- 1988 Taught English privately and at Novalingua Language Academy, Barcelona, Spain.

Student supervision

- 2012- Louise Palframan (MSc) Incorporating economic efficiency into systematic conservation planning.
- 2011-12 Darlington Tuagben (MSc) Socio-economic implications for increased risk of oil spills off the Liberian coast.
- 2010-11 Kate England (MSc) Conservation and socio-economic tradeoffs in the tourism management of the Sabaki estuary, Kenya.
- 2010-11 Sarah Lewis (MSc) The value of the Boulders penguin colony.
- 2009-10 Ian Kissoon (MSc) Using Guyana's tropical forests to combat global climate change without compromising local livelihoods.
- 2007-8 Anja Teroerde (MSc). Effects of mouth condition on birds of temporarily open-closed estuaries.
- 2006-9 Peter Ngoma (PhD). Social value of small-scale fisheries in the Zambezi River Basin.
- 2006-7 Helen Gordon (MSc). Factors influencing household dependence on natural resources in a Transfrontier Conservation Area, and implications for conservation strategy.
- 2005-6 Hugo van Zyl (PhD). Property Price Approaches to the Valuation of Urban Wetlands: Theoretical Considerations and Policy Implications.
- 2005-6 Noah Scovronick (MSc) Economic Claims for Transboundary Conservation: Reality or Rhetoric? A Case Study of the Kgalagadi Transfrontier Park
- 2005-6 Takalani Masizwe (MSc) The opportunity costs of conserving estuaries in the CAPE planning region: a study of property values
- 2005-6 Duan Biggs (MSc). What makes community-based avitoursim fly? An institutional perspective
- .2004-5 Philip Osano (MSc): Estimating the opportunity costs of biodiversity conservation in the Western Cape, South Africa.
- 2004-5 Victoria Napier (MSc): Valuation and management of the subsistence fishery on the Knysna estuary, South Africa.
- 2003-6 Ruth Parker (MSc). *Incentives for conservation of Renosterveld on private farm land.*
- 2002-3: Hilary Anderson (MSc): *Econometric analysis of the wildlife market in South Africa.*
- 2002-3. David Knox (MSc): *Assessing the conservation importance of estuarine intertidal invertebrate communities: a case study of warm temperate estuaries in South Africa.*
- 2001-2: Cath Hughes (MSc): *The potential impact of viticulture expansion on biodiversity in the Cape Floristic Region.*
 Rowena Smuts (MSc): *Rural resource use on Pemba, Tanzania.*
 Emily Kisamo (MSc): *The impacts of community conservation initiatives in Tanzania: a case study of villages around Udzungwa Mountains National Park.*
 Benis Ego (MSc): *A spatial analysis of natural resource use in rural eastern Caprivi.*
 Simiao Mahumana (MSc): *Rural attitudes towards conservation in Mozambique.*
- 2000-1 Gen Pence (MSc): *From conservation planning to implementation: what lies between. A case study of for the Agulhas region.*
 Sarah Frazee (MSc) *Estimating the costs of conserving a biodiversity hotspot: a case study of the Cape Floristic Region, South Africa.*
- 1999-0 Lyndon Estes (MSc): *An investigation of the role of cost-distance in determining the pattern of human impact on Arthrixia elata in and around Songimvelo Nature Reserve, Mpumalanga Province, South Africa.*

- Adnan Awad (MSc): *conservation of marine invertebrates in South Africa*
 Verna Love (MSc): *Human disturbance of waterbirds at the Knysna estuary, South Africa.*
- 1999 Jo Boule (BSc Honours): *Responses of birds to the invasion of Zostera on the Swartkops estuary*
 Carryn Manicom (BSc Honours): *Responses of invertebrates to the invasion of Zostera on the Swartkops estuary.*
- 1998-9 Anastelle Solomon (MSc): *The use and value of natural firewood resources in Paulshoek, Namaqualand, and the ecological impacts on rangeland dynamics.*
- 1997-9 Barry Heydenrych (MSc): *An investigation of land-use practices on the Agulhas Plain (South Africa), with emphasis on socio-economic and conservation issues.*
- 1998 Kari Gunson (MSc) *The economic value and sustainability of plant resource use in the eastern Caprivi-Chobe wetlands.*
 Richard Allcorn (MSc): *The economic value and sustainability of fisheries in the eastern Caprivi-Chobe wetlands.*
- 1997 Jennifer A. D'Amico (MSc): *Evaluating protected area expenditure: a case study in KwaZulu-Natal, South Africa.*
- 1996 Co-supervisor of two Zoology Honours students on prioritising conservation areas for migratory waterfowl, using life-history characteristics and on reserve selection methods.
- 1996 Co-supervisor of one Economics Honours student, on calculating multipliers from tourism expenditure in a coastal resort town.
- 1995-6 Stephen Katua (MSc): *Biogeography and priority areas for conservation of South Africa's coastal shelf ichthyofauna.*
 Charlotte Morgan (MSc): *The Boulders Park African Penguin colony: a valuable ecotourism resource.*
 Anna Balance (MSc): *Recreational use value of the Cape Peninsula's beaches, with special reference to pollution control.*

Conferences, Workshops, Meetings & Presentations

- 2013 Invited presentation. "The role of economics and ecosystem valuation in conservation". CapeNature Annual Conference. 6-7 November 2013.
- 2013 Invited presentation: "Interdisciplinary research needs for ecosystem services – a southern African perspective". Beijer-EfD international workshop on integrating ecological and economics research, Monkey Valley, Cape Town.
- 2011 MPA Forum presentation. ".Potential impact of the proposed Addo Marine Protected Area on commercial fisheries", Marine Protected Area Forum, Kei Mouth, November 2012
- 2011 Conference paper. "The value of marine protected areas along the Garden Route Coast, and implications of changes in levels of protection", EAERE, Rome June/July 2011
- 2011 Conference paper. "Value of the Kogelberg coast and implications of changes in management", South African Marine Science Symposium, Grahamstown April 2011
- 2011 Invited paper. "Conservation of estuaries as the marine-freshwater interface: the importance of an integrated and strategic approach, Society for Conservation Biology – International Marine Conservation Congress, Victoria, Canada May 2011
- 2009 Conference paper. "The nature, value and distribution of ecosystem services in South Africa" *Biodiversity Planning Form*, Pumula, Kwazulu-Natal Mar 2009.
- 2009 Conference paper. "Estimating the social and economic trade-offs in allocating environmental flows for the Pangani River Basin, Tanzania" *International EWA*, Port Elizabeth, Feb 2009.
- 2008 Conference paper: Integrating economics into conservation planning: a case study of temperate South African estuaries. *SANBI Biodiversity Symposium*, Mpekwani, March 2008.
- 2007 Conference paper: Integrating socio-economics and ecology in determining environmental flows. 10th International *Riversymposium* & Environmental Flows Conference, Brisbane 3 – 6 September 2007.
- 2005 Invited participant: Symposium on "Strategies for Restoring Natural Capital". 30 Oct – 2 Nov 05.
- 2004 Keynote speaker: Fynbos Forum, August 2004 "The potential role of economic tools in the conservation of the Cape Floristic Region".

- 2004 Invited speaker: Thicket Forum, April 2004: *"An ecological-economic analysis of the conversion to game farming in the Xeric Succulent Thicket"*
- 2004 Invited speaker: WorldFish Centre's Zambezi Basin Fisheries Workshop, Livingstone, Zambia, May 2004: *"Value of floodplain fisheries in the Zambezi Basin"*.
- 2004 Invited participant: IUCN's Water and Nature Initiative, to give a course on valuation methods to global IUCN's resource economists, and develop a direction for incorporating economics into integrated river basin management; Moshi, Tanzania, March 2004.
- 2003 Conference paper: *"Balancing ecology and economics in the multiple use of wetlands on communal lands"* International Rangelands Conference, Durban
- 2003 Keynote speaker: Working for Water's inaugural conference, Kirstenbosch July 2003: *"The role of resource economics in the control of alien invasive plants"*.
- 2002 Invited participant: Millenium Ecosystem Assessment: First meeting of the working group on ecosystem condition and trends. Rome 27-30 April 2002.
- 2002 Invited participant: Millenium Ecosystem Assessment: First meeting on the development of the conceptual framework. Paris 13-17 March 2002.
- 2001 Invited workshop participant: Beijer Institute workshop on Mangrove valuation. Malaysia, March 2001.
- 2001 Conference paper: *"Socio-economic aspects of natural resource use in the Rufiji delta"*. Second WIOMSA Symposium 22-26 Oct, Dar es Salaam, Tanzania.
- 2000 Invited presentation: *"Placing economic value on our natural resources"*. Experimental Biology Group Symposium, Sep 2000.
- 2000 Invited presentation: *"The role of resource economics in promoting wise and optimal use of natural systems in rural Africa"*. 29 Sep, Maputo, Mozambique.
- 2000 Lecturer at training workshop: *Community Involvement in Forest Management*, Kampala, Uganda, July 2000.
- 2000 Invited workshop participant: *Regional Biodiversity Forum: Using biodiversity to strengthen livelihoods in Eastern and Southern Africa*. 21-23 Feb 2000, Mombasa, Kenya.
- 2000 Member of project team: *Cape Action Plan for the Environment: Strategic Planning Workshop*, February 2000.
- 2000 Invited presentation: *Conservation and management of South Africa estuaries: conservation prioritisation and the new Water Act*. Environmental & Geographical Science Dept, UCT.
- 2000 Invited presentation: Conservation of estuarine biodiversity. *National Estuaries Workshop*, Port Elizabeth, May 2000.
- 1999 Invited workshop presentation: *The economic rationale for environmental management pertaining to water resources in the SADC region*. Harare, November 24-26.
- 1999 Invited speaker at GISP workshop co-ordinated by Prof. Charles Perrings on the economics of alien invasives, York, England, March 1999. Presentation: *"The economic consequences of alien invasion of the Cape Floral Kingdom's Fynbos vegetation."*
- 1999 Departmental presentation: *Water, wetlands & wealth: Blending ecology and economics to achieve the optimal sustainable use of aquatic resources*. Zoology Dept, UCT.
- 1999 Invited workshop participant: *Development of a methodology to determine the minimum water requirements of estuaries*, University of Port Elizabeth, Feb 1999.
- 1998 Selected participant in the Beijer Course on "Advanced methods in Economic valuation of Environmental Resources" at CATIE, Turrialba, Costa Rica, 23 Nov - 4 Dec.
- 1998 Invited as a trainee to the Beijer Research Seminar, River Club, Zambia, under Ken Arrow, Partha Dasgupta, Charles Perrings, Karl-Goran Maler, Jeff Vincent and Sara Anijar. Presentations: *"A preliminary assessment of fynbos stocks, yields and values in the Western Cape"* and a critique on a paper on the causes of deforestation in Malawi..
- 1998 *African Fisheries Congress, Grahamstown August 1998*. Presentation: *"Biogeography and the selection of priority areas for the conservation of South African coastal fishes"* (presented by LE Beckley).
- 1998 Piggs Peak, Swaziland. Maguga Dam EIA Presentation of Resource Economics study to government and royal family.
- 1997 Elected member of the Fynbos Forum committee.
- 1997 *Fynbos Forum, Genadendal*. - "National accounting: can Fynbos be valued?"

- 1997 Invited to attend: *The Beijer Institute of Ecological Economics' Teaching Workshop in Environmental Economics, Simonstown, 6 - 17 January 1997.* (An international training workshop for lecturers in environmental economics.)
- 1996 *PFAIO AGM, UCT.*- "Estimating the value of coastal resources."
- 1996 *6th International Behavioural Ecology Conference, Canberra, Australia 29 Sep - 4 Oct 1996* – Presentation: "Aggressive behaviour among foraging shorebirds: conscious decisions and random collisions".
- 1996 Invited presentation to Cape Nature Conservation, Head Office, Cape Town: *A preliminary economic assessment of De Hoop Nature Reserve.*
- 1996 Invited to attend the IUCN southern Africa workshop on *Economics, Policy and Natural Resource Management*, Pretoria 11-13 September.
- 1996 Invited presentation to Cape Nature Conservation, Overberg District: *A preliminary economic assessment of De Hoop Nature Reserve.*
- 1996 Invited to attend and compile the proceedings for a workshop entitled: *The creation of conditions and incentives that support the conservation and sustainable use of biological diversity*; organised by Rachel Wynberg, LAPC and DEAT as a contribution towards the formulation of a Biodiversity Policy and Strategy for South Africa.
- 1996 Co-organiser of the *Southern African Wildlife Management Symposium on Sustainable Use of Wildlife*, 9-11 April 1996.
- 1996 Invited presentation at *National Parks Board Bi-annual Warden's Meeting, Golden Gate National Park.* "Environmental economics and the value of natural resources"
- 1998 *International Ornithological Congress, Durban, Aug 1996.* Presentations: "Waders and their estuarine food supplies: are predatory impacts or predator behaviour the key to understanding carrying capacity? (presented by PAR Hockey); "The value of birding in South Africa" (with PG Ryan).
- 1996 *Southern Hemisphere Ornithological Conference, Albany Australia 5 - 9 Oct 1996* – Presentation: "Adaptive variation in the foraging behaviour of shorebirds at tropical and temperate latitudes".
- 1996 Invited presentation to Zeekoeivlei Civic Association workshop on the proposed False Bay Coastal Park: *The importance of Strandfontein Sewage Works as a bird habitat in a local, national and international context.*
- 1996 *Zoology Department, University of Stellenbosch.* Invited guest seminar: "Long flight to paradise? Foraging ecology of Grey Plovers on tropical and south temperate estuaries"
- 1996 *Meeting of the ethology group of the ZSSA, West Coast National Park.*
- 1995 *PFAIO AGM, UCT.*- "Environmental economics research at the PFAIO"
- 1995 *The sustainable use of the lowlands in the Western Cape: one day workshop.* Environmental economics working group.
- 1995 Helped organise and participated in the two-week *Ecological Economics workshop: "Valuation and management of fynbos ecosystems of the Cape Floristic Region, South Africa", UCT*, led by Professors R. Costanza and R Cowling.
- 1995 *Natal Parks Board Annual Research Symposium, Pietermaritzburg.*
- 1995 *Zoology departmental seminar, UCT.* - "Long flight to paradise? Foraging ecology of Grey Plovers on tropical and south temperate estuaries"
- 1994 *Zoological Society of Southern Africa Symposium, Pietermaritzburg.* - "Prioritizing South African estuaries for conservation: a practical example using waterbirds"
- 1994 *PFAIO AGM, UCT.* - "Conservation economics"
- 1993 *PFAIO AGM, UCT.* - "Foraging ecology of Grey Plovers and Whimbrels in tropical and south temperate latitudes"
- 1993 *8th Thematic Symposium of the Southern African Ornithological Society: Migration, dispersal and nomadism, Langebaan.* – Presentation: "Ecological correlates of migration distance in Grey Plovers and Whimbrels"
- 1992 *9th International Waterfowl Ecology Symposium (IWRB), Hajduszoboszlo, Hungary.* - Presentation: "Comparative diurnal and nocturnal foraging behaviour and energy intake of Grey Plovers and Whimbrels"
- 1992 *Wader Study Group Annual Conference, Hajduszoboszlo, Hungary.* - Presentation: "Nonbreeding territoriality among Grey Plovers at the Zwartkops estuary, South Africa"

- 1992 *PFAIO AGM, UCT.* - "Comparative foraging ecology of migrant waders on temperate and tropical estuaries"
- 1992 *Cape Bird Club, Cape Town.* - "Bird Migration"
- 1991 *Eastern Cape Wild Bird Society, Port Elizabeth.* - "Long distance migration by waders: choice or necessity?"
- 1991 *Marine, estuarine and freshwater ecosystems conference, Grahamstown.* - Presentation: "Long distance migration by Whimbrels: choice or necessity?"
- 1991 *PFAIO AGM, UCT.* - "Dark secrets unravelled: nocturnal foraging and wader energetics"
- 1989 *Symposium of the Zoological Society of Southern Africa, Etosha, Namibia.* - Presentation: "Distribution and diversity of large African mammals."
- 1990 *PFAIO AGM, UCT.* - "Foraging of Grey Plovers and Whimbrels - different solutions to the same problem?"
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A handwritten signature in blue ink, appearing to be 'Mie', written in a cursive style.

Signed:

ERM

Black Crystal Consulting

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