

BASIC ASSESSMENT REPORT
APPLICATION FOR ENVIRONMENTAL AUTHORISATION TO THE
NATIONAL DEPARTMENT OF ENVIRONMENTAL AFFAIRS
SEA-BASED AQUACULTURE DEVELOPMENT ZONE

APPENDIX B
Details of EAP, Expertise and
Declaration

Anchor Research & Monitoring (Pty) Ltd

Reg. no. 2017/458317/07

- marine, estuarine & freshwater ecology • environmental management • resource economics •
- natural resources management • conservation planning •



PROJECT DETAILS

Objective	Application for Environmental Authorisation in terms of the National Environmental Management Act, 1998 (Act No 107 of 1998)
Applicant	Department of Agriculture, Forestry & Fisheries
Environmental Assessment Practitioner (EAP)	Vera Massie under supervision of Dr Barry Clark from Anchor Research & Monitoring (Pty) Ltd
Anchor Project Name	Algoa Bay Sea-based Aquaculture Development Zone Basic Assessment Process
Anchor Project Number	1808
Status	Application phase
Application submission date	To be confirmed
Competent Authority Reference	Not currently assigned
Case Officer	Not currently assigned

OVERVIEW OF PROJECT OUTPUTS BASIC ASSESSMENT REPORT AND APPENDICES

Basic Assessment Report (BAR)	Pre-Application BAR – Released for comment between 28 March and 30 April 2019 Draft BAR - Current Final BAR – To be completed after application-phase public participation period
Appendix A	Environmental Management Programme (EMPr)
Appendix B	Details of EAP, Expertise and Declaration
Appendix C	Details of Specialists, Expertise and Declaration
Appendix D	Specialist studies: <ol style="list-style-type: none"> 1. Benthic Mapping Assessment for the Proposed Algoa Bay Sea-based Aquaculture Development Zone (Dawson <i>et al.</i> 2019) 2. Dispersion Modelling Study for the Proposed Algoa Bay Sea-based Aquaculture Development Zone (Wright <i>et al.</i> 2019) 3. Marine Specialist Study 2019 (Hutchings <i>et al.</i> 2019) 4. Maritime Underwater Heritage Specialist Study (Gribble 2019) 5. Comparative Assessments for the Development of the Proposed Sea-based Aquaculture Development Zone Located within Algoa Bay in the Eastern Cape in South Africa (Rhodes University August 2016) <ol style="list-style-type: none"> a. Socio-economic Report b. Ecological Report c. Feasibility study
Appendix E	Background Information Document
Appendix F	Stakeholder Consultation Report

APPENDIX 10
DECLARATION OF THE EAP

I, Dr Barry Clark, declare that –

- I act as the independent environmental assessment practitioner in this application;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I will take into account, to the extent possible, the matters listed in Regulation 13 of the Regulations when preparing the application and any report relating to the application;
- I undertake to disclose to the applicant and the Competent Authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the Competent Authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the Competent Authority, unless access to that information is protected by law, in which case it will be indicated that such information exists and will be provided to the Competent Authority;
- I will perform all obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I am aware of what constitutes an offence in terms of Regulation 48 and that a person convicted of an offence in terms of Regulation 48(1) is liable to the penalties as contemplated in Section 49B of the Act.

Disclosure of Vested Interest (delete whichever is not applicable)

- I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations;
- I have a vested interest in the proposed activity proceeding, such vested interest being:

Signature of the environmental assessment practitioner

Anchor Research & Monitoring (Pty) Ltd.

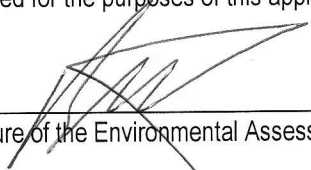
Name of company:

15 July 2019

Date

UNDERTAKING UNDER OATH/ AFFIRMATION

I, Dr Barry Clark, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.




Signature of the Environmental Assessment Practitioner

Anchor Research & Monitoring (Pty) Ltd.

Name of Company

15 July 2019

Date



Signature of the Commissioner of Oaths

15.07.2019

Date

Janine van Graan
Commissioner of Oaths
Associate General Accountants (S.A.)
P O Box 739
Constantia
7848

CURRICULUM VITAE

BARRY MALCOLM CLARK

BORN: 25 August 1968; Livingstone, Zambia **AGE:** 50 YEARS

NATIONALITY: South African, British

ACADEMIC QUALIFICATIONS:

Ph.D. Marine Biology, 1997, University of Cape Town

BSc (Hons) Marine Biology, 1991, University of Cape Town

BSc Zoology and Ocean & Atmosphere Science, 1990, University of Cape Town

OTHER QUALIFICATIONS: Scientific diver, Diving supervisor, Small boat skipper

LANGUAGE PROFICIENCY: English (Excellent), Afrikaans (Good)

COUNTRY EXPERIENCE: South Africa, Namibia, Lesotho, Mozambique, Tanzania, Kenya, Mauritius,
Angola, Ghana, Cote d'Ivoire, Nigeria, Liberia, Republic of Congo, Egypt,
United Arab Emirates, Azerbaijan

POSTAL ADDRESS: 8 Steenberg House, Silverwood Close, Tokai 7945

PHONE: +27-21-7013420

MOBILE: ++27-82 3730521

E-MAIL: barry@anchorencvironmental.co.za

FAX: +27 (0)-21-7015280

EMPLOYMENT HISTORY: 1991-1993 – Scientific Officer, University of Cape Town
2000-2002 – Marine Coordinator, Cape Peninsula National Park
1996-Present - Director, Anchor Environmental Consultants CC
2002-Present – Research Associate, University of Cape Town

SUMMARY PROFILE

Dr Barry Clark has twenty eight years' experience in marine biological research and consulting on coastal zone and marine issues. He has worked as a scientific researcher, lecturer and consultant and has experience in tropical, subtropical and temperate ecosystems. He is presently Director of an Environmental Consultancy firm (Anchor Environmental Consultants) and Research Associate at the University of Cape Town. As a consultant has been concerned primarily with conservation planning, monitoring and assessment of human impacts on estuarine, rocky shore, sandy beach, mangrove, and coral reef ecosystems as well as coastal and littoral zone processes, aquaculture and fisheries. Dr Clark is the author of 27 scientific publications in class A scientific journals as well as numerous scientific reports and popular articles in the free press. Geographically, his main area of expertise is southern Africa (South Africa, Lesotho, Namibia, Mozambique, Tanzania, Seychelles, Mauritius and Angola), but he also has working experience from elsewhere in Africa (Republic of Congo, Sierra Leone, Liberia, Cote d'Ivoire, Ghana, Nigeria), the Middle East (UAE) and Europe (Azerbaijan).

MEMBERSHIP OF PROFESSIONAL BODIES/ORGANISATIONS

Professional Natural Scientist, registered with the South African Council for Natural Scientific Professions (2004-)

Professional member of the South African Institute of Ecologists and Environmental Scientists (2000-)

South African representative to the SURVAS Network (Synthesis and Upscaling of Sea-level Rise Vulnerability Assessment Studies) (2000-)

Member of the International Association of Impact Assessors (IAIA) (2000-)

Member of the Subsistence Fisheries Task Group (1999-2000)

Member of the Subsistence Fisheries Advisory Group (2000-2002)

Member of the South African Network for Coastal and Oceanic Research (SANCOR) Economics Task Team

STUDENT SUPERVISION

Name	Institution	Degree	Thesis title	Year
Vici Napier	UCT	MSc	Value and management of the subsistence fishery at Knysna Estuary, South Africa	2004-2005
Khara Shine	UCT	MSc	Biogeographic Patterns and Diversity in Demersal Fish off the south and west coasts of South Africa: Implications for Conservation	2006-2007
Bomikazi Tshingana	UKZN	MSc	Relating flora, fauna and environmental parameters of Durban Bay Sandbanks	2017-2018
Josef Shikeva	UNAM	MSc	The use of underwater video footage as a tool in the assessment of mining related impacts on the hard-bottom benthic environment in southern Namibia	2018-2019
Nomcebo Dhlalani	US	MSc	ICP-MS analysis of trace metals in Pacific Oysters (<i>Crassostrea gigas</i>) within the Port of Saldanha, South Africa	2019-2020

SELECTED PROJECT EXPERIENCE

Period	Country	Client	Project, Tasks
2018-2019	Mozambique	Golder/ Sasol	Environmental impact assessment for 2D and 3D seismic surveys and exploratory drilling in Block 16 & 19, offshore in Inhambane Province, Mozambique.
2018-2021	South Africa	Mhlathuze Water	Toxicity testing, water, sediment and flora and fauna monitoring for Mhlathuze Water Effluent Pipelines, in Richards Bay, South Africa
2018	Republic of Congo	Kola Potash	Marine ecology impact assessment, baseline studies and toxicity testing for the Kola Potash project, Republic of Congo
2018	South Africa	Sun International/ GCX Analytics	Marine ecology impact assessment for discharge of brine effluent from a Reverse Osmosis desalination plant in Granger Bay
2018	Mozambique	JG Afrika/ Mozal	Estuarine impact assessment for discharge of brine

Period	Country	Client	Project, Tasks
			effluent from a Reverse Osmosis desalination plant into Maputo Bay
2018	South Africa	Kleinzee Mariculture	Environmental Impact Assessment for construction and operation of abalone holding tanks and associated infrastructure at Kleinzee.
2018	South Africa	ArcelorMittal Saldanha	Marine ecology impact assessments for the discharge of brine effluent from a Reverse Osmosis desalination plant
2018	South Africa	Diamond Coast Abalone	Environmental Impact Assessment for an Aquaculture Farm in Kleinzee, Northern Cape
2018	South Africa	G7 Renewable Energies (Pty) Ltd	Marine ecology impact assessment for discharge of brine effluent from a Reverse Osmosis desalination plant in Gordon's Bay, South Africa
2018	South Africa	Mainport Africa	Assessment of biofouling community collected from MV Cherry Blossom
2017-2018	Sierra Leone	Iluka/Sierra Rutile (Ltd)	Marine and estuarine specialists studies for an Environmental, Social and Health Impact Assessment (ESHIA) for proposed expansions to Sierra Rutile Limited's mining operations in Sierra Leone
2017	South Africa	Advisian, City of Cape Town	Marine ecology impact assessments for nine desalination plants for the Cape Town Emergency Water Resilience Project
2017	South Africa	Hospitality Property Fund	Marine ecology impact assessment and Coastal Waters Discharge Permit application for a desalination plant at the Westin Hotel, Cape Town.
2017	South Africa	GIBB, Transnet National Ports Authority	Strategic Environmental Assessment for Port of Cape Town - Oceanographic and ecological significance and sensitivity of the Port of Cape Town and surrounding areas
2017	South Africa	Shell Downstream South Africa (Pty) Ltd	Specialist marine ecology report for coastal water discharge permit application for Shell Downstream South Africa (Pty) Ltd Bulk Chemicals Storage Facility, Port Elizabeth
2017	South Africa	Viking Fishing (Pty) Ltd	Socio-economic assessment of a 60% reduction in Viking fishing group's allocation in the inshore demersal trawl fishery
2016-2017	South Africa	SIROCCON Consulting Engineers & Project Managers	Specialist marine impact studies for a proposed Atlantic Salmon farm at Dwarskersbos
2016-2017	South Africa	CEN Environnemental Mangement Unit, Nelson Mandela Metro	Dispersion modelling for the Driftsands Waste Water Treatment Works, Port Elizabeth, South Africa
2016-2017	South Africa	Tongaat Hullet	Marine ecology impact assessment for a proposed beach enhancement initiative at Tinley Manor
2016-2017	South Africa	Nemai Consulting, Transnet National	Marine Impact Assessment for the proposed offshore sand winning for developments within the

Period	Country	Client	Project, Tasks
		Ports Authority	Port Of Durban, KwaZulu Natal
2016-2017	South Africa	Department of Environmental Affairs	Revision and update of the South African Water Quality Guidelines for Coastal and Marine Waters – 2017. Natural Environment, Mariculture and Industrial Use
2016-2017	South Africa	Royal Society for Protection of Birds	Assessment of the effects of exposure to brodifacoum pellet bait on Tristan Rock Lobster <i>Jasus paulensis</i>
2016-2017	South Africa	Elandsfontein Exploration and Mining (Pty) Ltd	Assessment of the impacts of the Elandsfontein Phosphate Mine on Langebaan Lagoon
2016-2017	South Africa	Department of Agriculture, Forestry, Fisheries	Assessment of catch and effort in the West Coast Rock Lobster recreational fishery
2016-2017	Namibia	Namdeb Diamond Company	Benthic macrofauna and sediment quality monitoring programme for the Mid-water license region, Namibia
2016	South Africa	DeBeers Group of Companies	Assessment of mining-related impacts on macrofaunal benthic communities in the Northern Inshore Area of Mining Licence Area MPT 25-2011 and subsequent recovery
2016	South Africa	Advisian, Oiltanking Mogs Saldanha (RF) (Pty) Ltd	Marine ecological specialist study for the proposed HDPE pipeline and sea water intake and discharge for Oiltanking Mogs Saldanha (Rf) (Pty) Ltd
2016	Republic of Congo	Southern Waters, International Finance Corporation	Aquatic Biodiversity Assessment for the Sounda Hydropower Project
2016	South Africa	Southern Cross Salmon	Marine specialist environmental impact report for a proposed salmon and trout sea cage farm Jutten Island Saldanha -
2016	South Africa	Port Owen Marina Authority	Assessment of currents and invertebrate and fish fauna in the Berg Estuary channel and recommendations for disposal of dredge water
2016	Lesotho	Lesotho Highlands Development Authority	Specialist study of freshwater fish populations present in rivers and streams adjacent to the proposed Polihali Dam in the Lesotho Highlands
2016	South Africa	Department of Water & Sanitation	Classification of and determine the Resource Quality Objectives for significant water resources within (1) the Berg Water Management Area and (2) the Breede Gouritz Water Management Area (2 separate appointments). Project leader on the estuaries component of both projects.
2016	South Africa	Transnet National Ports Authority	Baseline ecological assessment of marine and estuarine fauna and flora at Pier 1 and Salisbury Island, Port of Durban and an assessment of the potential impacts associated with the upgrade and expansion of the terminal.

Period	Country	Client	Project, Tasks
2016	South Africa	Transnet National Ports Authority	Assessment of ecosystem goods and services associated with Durban Bay any assessment of potential impacts associated with the development of the Container Terminal at Pier 1 and Salisbury Island
2016	South Africa	ACC Agriculture	Risk assessment for introduction of <i>Camelina savitina</i> as a commercial crop into South Africa
2015	Liberia	Conservation International	Identification and profiling of priority mangrove sites in Liberia through remote sensing and field surveys and identification and delineation of two coastal and marine protected areas
2015	South Africa	AquaTech	Risk assessment for in-water hull cleaning operations in the Port of Durban, South Africa
2015	Tanzania	Aurecon, Schlumberger	Environmental impact assessment for a supply base for Schlumberger in Mtwara port, Tanzania
2015	South Africa	Cape Nature	Environmental flows assessment for the Klein River estuary, South Africa
2015	South Africa	Mossel Bay Municipality	Preparation an estuary management plan for the Hartenbos Estuary
2015	South Africa	Department of Environmental Affairs	Development of an assessment framework for management of effluent discharged from land-based sources to the marine environment in South Africa
2015	Seychelles	Raffles Hotel, Aurecon	Assessment of impacts of diesel spill on mangrove forest community on Praslin Island, Seychelles
2014-2016	South Africa	Transnet National Ports Authority	Baseline monitoring programme for all sandbank areas in the Port of Durban.
2014-2015	South Africa	Transnet National Ports Authority	Design and implementation of a water and sediment quality monitoring programme in the Port of Durban
2014-2015	South Africa	Oceana/SRK	Application for a coastal water discharge permit for the Lucky Star Fish Processing Plant, St Helena Bay
2014-2015	South Africa	Coega Development Corporation	Assessment of impacts of waste water discharge from Coega Industrial Development Zone, Algoa Bay
2014-2017	Namibia	DeBeers Marine Namibia	Benthic macrofauna and sediment quality monitoring programme for the Atlantic 1 Mining Licence Area, Namibia
2014-2015	South Africa	Cape Nature	Environmental flow assessment for the Heuningnes estuary, South Africa
2014-2015	South Africa	South African Pelagic Fishing Industry Association	Assessment of the socio-economic impacts of a reduction in the sardine minimum Total Allowable Catch (TAC)
2014-2015	South Africa	Nelson Mandela Bay Metro, GIBB	Assessment of impacts of waste water discharge from a new WWTW at Cape Recife, Algoa Bay
2014	Seychelles	USAID	Implementation of the "reef gardening" approach for restoration of coral reefs on Praslin Island, Seychelles, lost as a result of El Nino and global warming induced bleaching events.
2014	South Africa	Molapong	Risk Assessment for culture of King and Coho salmon

Period	Country	Client	Project, Tasks
		Aquaculture	in South Africa
2014	South Africa	NWJ Environmental	Impact assessment for a proposed sand mining operation on the Umzumbe Estuary, KwaZulu-Natal
2014	Mozambique	Marine Stewardship Council	Scoping study to assess potential impacts of upgrading the cruise liner facilities at Portuguese Island, Mozambique
2014	South Africa	Bayside Aluminium, WSP	Environmental impact assessment for the decommissioning of the Bayside Aluminium Smelter, Richards Bay
2014	South Africa	Tronnox Namaqua Sands, SRK	Assessment of impacts of a seawater intake for the Tronnox Namaqua Sands mineral processing facility, Northern Cape
2014	South Africa	AquaConcepts	Risk assessment for import of ornamental marine fish species into South Africa
2014	South Africa	Dormac, WSP	Assessment of impact associated with the development of a floating dry dock in the Port of Durban, South Africa
2014	South Africa	Transnet National Ports Authority	Assessment of potential impacts of the proposed Durban Dig Out Port of the annual sardine migration up the East coast of South Africa
2014	South Africa	WWF-SA	Design and development of a Fisheries Improvement Project for Small Scale Fisheries in the Kogelberg
2014	South Africa	Tronnox Namaqua Sands, Matzikamma Municipality, SRK	Environmental impact assessment for an aquaculture facility at Doringbaai, Northern Cape
2014	Tanzania	Aurecon	Development of a Spatial Development Framework for the coastal environment in the Mtwara/Mikandani Municipal area, Tanzania
2014	South Africa	WSP/ Engen	Assessment of the impacts of an oil spill on mangrove forest communities in the Port of Richards Bay, South Africa
2014	South Africa	Frontier Rare Earths, Coastal Environmental Services	Assessment of impacts of a seawater intake for the Frontier Rare Earths mineral processing facility, Northern Cape
2014	South Africa	Cape Nature	Rezoning and realignment of borders for Betty's Bay, Goukamma and Robberg marine protected areas in South Africa
2013-2014	South Africa	Paardevelei Properties	Assessment of the likely impacts of associated with a new stormwater management system at Paardevelei
2013-2014	South Africa	iSimangaliso Wetland Park Authority	Assessment of the hydrological, hydrodynamic and ecological functioning of the Lake St Lucia Estuarine System and formulation of recommendations for rehabilitation and improved management of the system.
2013-2014	Lesotho	Lesotho Highlands Development Authority	Assessment of the impacts of land use changes and other pressures related to the construction and operation of the Katse and Mohale Dams on its

Period	Country	Client	Project, Tasks
			catchment area and attendant fish populations
2013	South Africa	Cape Nature, Department of Environmental Affairs	Assessment of impacts of an oil spill on sandy beach and rocky intertidal communities in the Goukamma MPA
2013	South Africa	Transnet National Ports Authority	Marine specialist study as part of an EIA for upgrading the General Maintenance Quay (GMQ) in the Port of Saldanha Bay
2013	Namibia	LL Namibia Phosphates	Review and update of a Scoping Report and Environmental Management Plan for prospecting for phosphorus deposits in Mining Licence Area 159 off the coast of Namibia
2012- 2013	South Africa	Department of Agriculture, Forestry & Fisheries	Biodiversity Risk and Benefit Assessments (BRBAs) for the seven most important alien species used in the aquaculture industry in South Africa including Pacific oyster <i>Crassostrea gigas</i> , Mediterranean mussel <i>Mytilus galloprovincialis</i> , sharptooth catfish <i>Clarius gariepinus</i> , rainbow trout <i>Onchorhynchus mykiss</i> , brown trout <i>Salmo trutta</i> , Nile Tilapia <i>Oreochromis niloticus</i> and Marron <i>Cherax tenuimanus</i> .
2012- 2013	South Africa	Abagold (Pty) Lt	Environmental Impact Assessment for the construction and operation of a wave energy converter (WEC), pump assistance pond and effluent pipe turbine for the Abagold abalone farm.
2012- 2013	South Africa	East London Industrial Development Zone	Feasibility study for the establishment of an Aquaculture and Biotechnology Business Incubator for the East London Industrial Development Zone.
2012	Mozam-bique	Consultec Lda	Water quality assessment and toxicity testing for a proposed coal transfer facility in Beira, Mozambique
2012	Mauritius	Mauritius Oceanography Institute	Alien species, and water and sediment quality assessment of Port Louis, Mauritius.
2012	Namibia	Ministry of Environment and Tourism	Study to identify a set of Core National Environmental Indicators Network (NCEIS), Integrated State of Environment Baseline Report (ISoER) for Namibia's Protected Area Network (PAN), and Coastal and Marine Ecosystems.
2012	South Africa	uMkhanyakude District Municipality/ Nemai Consulting	District-Wide Environmental Management Framework for the uMkhanyakude District Municipality
2012	South Africa	Transnet National Ports Authority	Assessment of potential impacts of iron ore oxide (Fe ₂ O ₃) on the marine flora and fauna of Saldanha Bay.
2012	South Africa	Department of Water Affairs/ Nemai Consulting	Environmental Impact Assessment for the Ncwabeni OCS Dam on the Mzimkhulu estuary
2012	South Africa	East London Industrial	Seawater Quality Monitoring Program for aquaculture developments in the East London

Period	Country	Client	Project, Tasks
		Development Zone	Industrial Development Zone
2012	South Africa	Transnet National Ports Authority/ Nemai Consulting	Environmental Impact Assessment for the deepening, lengthening and widening of Pier 2 in the container terminal of the Port of Durban.
2011	South Africa	City of Cape Town	Development of water quality indices and related reporting tools for Inland and coastal waters of the City of Cape Town
2011	South Africa	Overstrand District Municipality/ SSI	Environmental impact assessment for a Waste Water Treatment Works in the Overstrand District Municipality
2010-2013	South Africa	Department of Agriculture, Forestry & Fisheries (DAFF)	Environmental impact assessment for four Marine Aquaculture Development Zones (MADZs) in the Eastern Cape, South Africa.
2010	South Africa	Department of Agriculture, Forestry & Fisheries (DAFF)	Strategic Environmental Assessment (SEA) to identify potential sea-based finfish aquaculture development zones (ADZ) off the South African coastline.
2010	South Africa	Doug Jeffery Environmental Consultants	Environmental impact assessment for an illegal tide pool constructed at Danger Point, Gansbaai.
2010	South Africa	Department of Environmental Affairs & Development Planning, Western Cape Government	Evaluation of boat launching sites in the Western Cape.
2010	South Africa	Department of Environmental Affairs & Development Planning, Western Cape Government	Assessment of the effects of heavy metal accumulation from land based sources on the Diep River Estuary.
2010	South Africa, Namibia	UNDP-GEF Orange-Senqu Strategic Action Programme	Assessment of the impact of changes in the flow regime of the Orange-Senqu River and its impacts on the degradation of the estuary and the broader Benguela Current System.
2010	Tanzania	BRL/ SWECO/ SADC	Baseline description and health assessment for the Rovuma Basin, Tanzania.
2010	South Africa	Water Research Commission, Department of Water Affairs	Update of methods for estimation of freshwater flow requirements for estuaries in South Africa.
2010	South Africa	Chand Environmental	Assessment of the status and sensitivity of the coastal marine environment off Partridge Point on the Cape Peninsula, and likely impacts that would arise from development of the site.
2010	South Africa	Element Consulting Engineers (Pty) Ltd	Environmental impact assessment for a proposed residential and resort development at Trekoskraal on the marine environment.

Period	Country	Client	Project, Tasks
2009-2011	South Africa	Various companies	Environmental impact assessments for a suite of desalination plants at Sedgefield, Plettenberg Bay, Witsands, Saldanha Bay, and Port Nolloth. (Five separate appointments.)
2009-2011	South Africa	Cape Action Plan for People & the Environment (C.A.P.E.)/Cape Nature/Marine & Coastal Management (MCM)	Development of management plans for the Olifants, Berg, Uilkraals, and Great Brak Estuaries, South Africa. (Four separate appointments).
2009-2011	South Africa	WWF-SA, Lotto Programme	Recreational fisheries monitoring programme coordinating a team of 20 fisheries monitors at 6 sites on the South and East coasts of South Africa.
2009-2010	Azerbaijan	United National Development Programme, Azerbaijan Country Office	International consultant appointed to prepare Project Identification Form (PIF) and Project Preparation Grant (PPG) for a GEF medium-size project on the expansion of the marine and coastal protected area network in Azerbaijan.
2009-2010	South Africa	Department of Water Affairs & Forestry	Assessment of the nature, distribution and value of aquatic ecosystem services of the Olifants, Inkomati And Usutu To Mhlatuze Water Management in South Africa.
2009-2010	South Africa	WWF-SA/Cape Action for People and the Environment (C.A.P.E.)	Project leader responsible for the preparation of marine and coastal spatial plans and socio-economic assessments for the Kogelberg Biosphere Reserve and Garden Route Initiative.
2009-2010	South Africa	Department of Water Affairs	Environmental Flow Assessment for the Berg Estuary which including preparing scenario assessments of the likely environmental and socio-economic consequences variable fresh water allocation for the estuary.
2009	South Africa	West Coast District Municipality, Jeffares & Green (Pty) Ltd	Environmental assessment of the Jakkalsvlei estuary, and of ecological impacts of illegal excavation and infilling activities
2009	Global	UNDP	Researcher on an assessment of the impact of climate change on the Global Fisheries sector and opportunities and incentives required for adaptation
2009	South Africa	City of Cape Town	Design of a Coastal Monitoring Programme for the City of Cape Town (City of Cape Town).
2009	South Africa	Sturrock Shipping (Pty) Ltd	Marine ecological expert responsible for assessment of marine fouling on vessel, Rita Knutsen.
2009	South Africa	Doug Jeffery Environmental Consultants	Assessment of the status and sensitivity of the coastal marine environment off Oudekraal on the Cape Peninsula
2008-	South Africa	Century City	Assessment of the effectiveness of a fish eradication

Period	Country	Client	Project, Tasks
2011		Property Owners Association	programme conducted in the Century City wetlands and canals using the ichthyocide rotenone.
2008-2009	Tanzania, Kenya	Programme for the Sustainable Management of the Coastal Zone of the Countries of the Indian Ocean	Design and implementation of training courses and workshops on Information for Fisheries Co-Management in Dar es Salaam, Tanzania and Mombassa, Kenya.
2008	South Africa	Water Research Commission, Fresh Water Consulting Group	Marine specialist on a project to develop a classification system for wetlands in South Africa.
2008	South Africa	Water Research Commission (WRC)	Design and development of an integrated ecological-economic model to be used to assess freshwater flow requirements for the East-Kleinemonde estuary, a temporally open-closed estuary on the East coast of South Africa.
2008	South Africa	DCD-Dorbyl (Pty) Ltd	Environmental audit of Globe Engineering Works (Pty) Ltd, DCD-Dorbyl (Pty) Ltd and Natulis Marine (Pty) Ltd (Nautilus), three engineering companies based in the Port of Cape Town, South Africa
2008	Angola	Tullow Oil Plc	Environmental Impact Assessment, Environmental Overview and identification of Environmental Best Management Practise (BMP) required for seismic surveying and exploratory drilling for offshore oil and gas resources in Blocks 1, Angola.
2008	South Africa	Department of Environmental Affairs & Development Planning/SRK Consulting	Marine and coastal specialist contributing to the preparation of the State of the Environment Report (SoER) for the Western Cape Province, South Africa.
2008	South Africa	CSIR/Transnet National Ports Authority (Transnet-NPA)	Independent consultant appointed to review an Environmental Impact Assessment and Environmental Management Plan for dredging and dredge spoil disposal for the Ben Schoeman Dock, Port Of Cape Town.
2008	South Africa	Transnet National Ports Authority (Transnet-NPA)/SRK/PD Naidoo & Associates	Independent consultant appointed to review Marine Specialist study components of an Environmental Impact Assessment for extension of the iron ore export terminal and associated ore handling facilities in Saldanha Bay, South Africa
2007-2011	South Africa	Resource Ballast Technology (Pty) Ltd	Independent assessor of efficacy of a newly developed ballast water treatment system and evaluation (risk assessment) of the residual toxicity of ballast water treated with the system.
2007-2011	South Africa	Department of Environmental Affairs & Tourism:	Shore based fisheries monitoring programme designed to assess levels of fishing mortality, stock abundance indices and to evaluate the effectiveness

Period	Country	Client	Project, Tasks
		Marine and Coastal Management (DEAT: MCM)	of management measures for the commercial and recreational linefishery, tuna pole and hake handline fishing in South African waters.
2007-2011	South Africa	Department of Environmental Affairs & Tourism: Marine and Coastal Management (DEAT: MCM)	Offshore, boat-based fisheries monitoring programme designed to supply and deploy aboard fishing vessels, competent, suitably trained and equipped scientific observers for the inshore trawl, hake longline and west coast rock lobster fisheries.
2007-2010	Ghana	Tullow Oil Plc	Environmental Impact Assessment, Environmental Overview and identification of Environmental Best Management Practise (BMP) required for seismic surveying and exploratory drilling for offshore oil and gas resources in the Tano shallow water and Deep water blocks in Ghana. (Three separate EIA studies).
2007	South Africa	Shelley Point Breakwater (Pty) Ltd/Doug Jeffery Environmental Consultants	Environmental Impact Assessment for the Shelly Point Small Craft Harbour.
2007	South Africa	University of Cape Town	Project supervisor on a study on fish populations in three False Bay estuaries (Zandvlei, Eerste and Lourens).
2006-2011	Tanzania	International Conservation Union (IUCN)/Pangani Water Basin Office, Tanzania	International mentor of the Estuary Team for a project entitled "Flows for People and the Environment: Supporting Sustainable Land Management in the Pangani Basin (Tanzania)".
2006-2007	South Africa	Cape Action Plan for People & the Environment (C.A.P.E.) and World Wildlife Foundation (WWF)	Project leader responsible for development of a fine scale conservation plan for the Agulhas Marine Bioregion.
2006-2007	South Africa	Department of Science and Technology (DST) and the South African Environmental Observation Network (SAEON)	Consultant appointed to lead the process of developing a data management facility for the South African National Antarctica Programme (SANAP) in consultation with the SANAP research and management community.
2006	South Africa	Seaton Thompson and Associates and Tintswalo Atlantic	Environmental Impact Assessment for a proposed guest lodge development at Koeelbaai, under Chapman's Peak Drive, in the Table Mountain

Period	Country	Client	Project, Tasks
		(Pty) Ltd	National Park (TMNP)
2006	Mozambique	Ministry of Co-ordination of the Environment/ World Bank/European Union	Team leader (Expert level I) appointed to prepare a Country Environmental Profile for Mozambique.
2005-2008	South Africa	Port Nolloth Sea Farms (Pty) Ltd/ Department of Environmental Affairs and Tourism (DEAT)	Assessment of ecological impacts and biological and economic viability of abalone ranching in South African west coast.
2005-2007	Angola	BCLME Programme/ United Nation Development Programme (UNDP)/ UNOPS/Global Environment Facility (GEF)	Assessment of the status of biodiversity along the Angola coastline.
2005-2007	South Africa	Cape Action Plan for People & the Environment (C.A.P.E.), Cape Nature, and Department of Environmental Affairs & Tourism: Marine and Coastal Management (DEAT: MCM)	Biodiversity and economic assessment and development of an integrated conservation plan for CAPE estuaries.
2005-2007	Angola, Namibia, South Africa	BCLME Programme/ United Nation Development Programme (UNDP)/ UNOPS/Global Environment Facility (GEF)	Assessment of human capacity, training and infrastructure available within the three countries bordering the BCLME – Angola, Namibia and South Africa.
2007, 2005	South Africa	Transnet-National Ports Authority (Transnet NPA)	Ballast water, flora and fauna survey in the Ports of Durban and Port Elizabeth.
2005	South Africa	Department of Environmental Affairs and Tourism (DEAT)	National State of the Environment Report (SoER) for South Africa.

Period	Country	Client	Project, Tasks
2005	South Africa	Department of Environmental Affairs and Tourism (DEAT)	Assessment of the marine and coastal tourism potential for the Arniston fishing harbour.
2005	Angola, Namibia, South Africa	Benguela Current Large Marine Ecosystem (BCLME) Programme (UNDP/World Bank)	Development of and operationalisation of an affordable, sustainable and user-friendly State of Ecosystem Information System (SEIS) for the BCLME region (Angola, Namibia, South Africa).
2005	South Africa	National Empowerment Fund (NEF)	Due diligence (feasibility) study to assess the feasibility of a proposed eel aquaculture and processing operation in the Eastern cape, South Africa.
2005	South Africa	Department of Environmental Affairs & Tourism	Supervisor on a project to assess the socio-economic value and ecological impacts of the subsistence fishery for sand and mud prawns, and fish in the Knysna estuary, South Africa
2004-2017	South Africa	Saldanha Bay Water Quality Forum Trust (SBWQMFT)	Preparation of a series of "State of the Bay" Monitoring Programme and Reports for Saldanha Bay and Langebaan Lagoon in 2004, and annually between 2008 and 2017.
2004-2008	South Africa	WWF-SA/South African National Parks	Development and implementation of a coastal monitoring programme for the Table Mountain National Park Marine Protected Area.
2004-2005	South Africa	Department of Environmental Affairs and Tourism (DEAT)	Formulation of recommendations on an appropriate permit fees and permitting systems for recreational SCUBA divers and SCUBA diving tour operators in Aliwal Shoal, Pondoland, Bird Island, Tsitsikamma and Table Mountain National Park Marine Protected Areas (MPAs).
2004	South Africa	I & J	Environmental Impact Assessment for an abalone farm at Danger Point, Western Cape.
2004	DRC, Angola, Namibia, South Africa, Mozamb., Tanz., Mauritius, Seychelles	EU-SADC MCS Fisheries Programme	Production of instructional material and the holding of a seminar on the effects of pollutants, illegal fishing methods and the requirements of relevant conventions signed by the SADC states.
2004	South Africa	City of Cape Town	Environmental Impact Assessment for a coastal walkway between St James and Kalk Bay, in False Bay, South Africa.
2004	South Africa	City of Cape Town	Environmental Impact Assessment to assess impacts of an education centre and tidal pool, at Bordjiesrif in False Bay, South Africa.
2004	Mozambique	Southern African Development Community/	Production of a policy document and strategy for fisheries Monitoring Control Surveillance in Mozambique.

Period	Country	Client	Project, Tasks
		Government of Mozambique	
2004	South Africa	Botanical Society of South Africa	Preparation of guidelines to assist environmental assessment practitioners in selecting biodiversity specialists for involvement in Environmental Impact
2004	Southern Africa	IPCC/ START Programme	Desktop assessment of the likely impacts of climate change on estuaries in southern Africa.
2004	South Africa	EKZN Wildlife Service/ Department of Environmental Affairs and Tourism (DEAT)	Review and assessment of the management of subsistence fisheries in KwaZulu-Natal, South Africa.
2003-2005	South Africa	Department of Water Affairs & Forestry (DWAFF)	Project manager, estuarine coordinator and fisheries specialist on the Berg River Baseline Monitoring Programme.
2003-2004	South Africa/ Namibia/ Angola	BCLME Programme/ UNDP/ UNOPS/ GEF	Capacity and Needs Assessment for the Benguela Current Large Marine Ecosystem (BCLME) Project involving three countries – Angola, Namibia and South Africa.
2003-2004	South Africa	Makana Marine and Projects	Environmental Impact Assessment for the development of a new ship repair facility in the Port of Cape Town.
2003-2004	South Africa	World Wildlife Fund, South Africa (WWF-SA)	Production of a business plan for the proposed Kogelberg Marine Park.
2003-2004	South Africa	Department of Environmental Affairs and Tourism (DEAT)	Strategic Environmental Assessment to guide the implementation of regulations promulgated under the National Environmental Management Act 1998: Control of Vehicles in the Coastal Zone.
2003	South Africa	Globalballast Programme/ IMO/UNDP/ GEF	Development of a Ballast Water Management Plan for the Port of Saldanha, South Africa.
2003	South Africa, Namibia and Angola	Global International Waters Assessment (GIWA) Programme/ GEF	Global International Water Assessment (GIWA) for the Benguela region (South Africa, Namibia and Angola).
2002-2003	South Africa	Cape Action for People and the Environment / World Bank/ UNDP	Lead consultant on the Marine and Coastal Component of the Cape Action for People and the Environment (C.A.P.E.) programme responsible for the developing components of the Project Concept Document (PCD) and Project Implementation Plan (PIP).
2002-2003	Namibia	Namdeb Diamond Company	Environmental Impact Assessment for the Wet Overburden Mining System in Mining Area 1, Oranjemund, Namibia.
2002-	South Africa	Department of	Assessment of the quantity of abalone caught by

Period	Country	Client	Project, Tasks
2003		Environmental Affairs & Tourism	recreational fishers during the 2002/2003 fishing season.
2002-2003	South Africa	Water Research Commission, Department of Water Affairs & Forestry	Assessment of the relative contribution and importance of individual estuaries to overall estuarine biodiversity in South Africa.
2002-2003	South Africa	National Ports Authority/ Globallast Programme	Baseline survey of subtidal reef biota and reef fish off Jaheel & St Croix Islands, Algoa Bay.
2002	Africa	GEF/UNDP UNESCO/IOC/ACOPS	Regional Technical Coordinator for the Working Group on Sustainable Use of Living Resources as part of Phase 2 of the GEF MSP Sub-Saharan Africa Project (GF/6010-0016): Development and Protection of the Coastal and Marine Environment in Sub-Saharan Africa.
2002	South Africa	Department of Environmental Affairs & Tourism	Acoustic tracking study of the West Coast rock lobster (<i>Jasus lalandii</i>) in the Hermanus Whale Sanctuary, on the south-west coast of South Africa.
2002	Namibia	Namdeb Diamond Company	Environmental assessment of sandy beaches in Mining Area 1, Oranjemund, Namibia and an environmental baseline study in a previously unexploited area on the coast.
2002	South Africa	National Research Foundation	Launch the Marine and Coastal Node of the South African Environmental Observatory Network (SAEON) programme.
2002	South Africa	Department of Environmental Affairs & Tourism	Assessment of sardine migration habitats off the East coast of South Africa.
2002	South Africa	Department of Environmental Affairs & Tourism	Fisheries monitoring programme for an experimental hoop-net fishery for west coast rock lobster off Cape Hangklip, South Africa.
2002	South Africa	University of Rhode Island/ History of Marine Animal Populations	Desktop assessment of the likely impacts of climate change on the ecosystem functioning and fisheries of the Benguela ecosystem, South Africa.
2002	Seychelles		Assessment of the status of fisheries, fish stocks, and approaches to fisheries management in the Seychelles
2001-2002, 2009-2010	South Africa	Department of Environmental Affairs & Tourism	Assessment of the quantity of west coast rock lobster caught by recreational fishers during the 2001/2002 and 2009/2010 fishing seasons.
2001-2003	South Africa	Department of Environmental Affairs & Tourism/ Rhodes University	Economic Sectoral Study of the South African Fishing Industry.
2001-	South Africa	AECI/SYNEXUS	Assessment of risks to marine life and human health

Period	Country	Client	Project, Tasks
2002			resulting from disposal of contaminated groundwater from the Umbogintwini waste disposal site.
2001	South Africa	GEF/UNDP/IMO Globalballast Programme	Ballast water fauna and flora survey in the Port of Saldanha.
2001	South Africa	Nitrogen Products	Marine specialist on an EIA to assess impacts of effluent disposal on the marine environment from a fertilizer factory.
2001	South Africa	Maribus Industries	Application for a seawater lease and mariculture permit for a Gracilaria farm in St Helena Bay, South Africa
2001	United Arab Emirates	Dubai Municipality/ Martin Mid-East	Assessment of impacts of effluent discharges and shipbuilding activities on Dubai Creek, UAE.
2000-2002	South Africa	South African National Parks	Marine Coordinator Cape Peninsula National Park, responsible for the design and development of a marine component for the newly established Cape Peninsula National Park.
2000-2002	South Africa	Freshwater Consulting Group	Assessment and monitoring changes in the fish community of the Koekdou River following construction of a new dam on the system
2000-2001	Africa	GEF/UNDP UNESCO/IOC/ACOPS	National coordinator for South Africa on Phase 1 of the GEF MSP Sub-Saharan Africa Project (GF/6010-0016): Development and Protection of the Coastal and Marine Environment in Sub-Saharan Africa.
2000-2001	South Africa	SRK Consulting and PD Naidoo and Associates	Environmental Impact Assessment of potential impacts of the extension of the iron ore handling facility in Saldanha Bay on the marine environment and mariculture activities.
2000	South Africa	City of Cape Town/ Southern Water Ecological Research and Consulting	Environmental Impact Assessment for the upgrade of a rubble weir and other mouth management options for the Zandvlei estuary.
2000	South Africa	On Track Developments/ Chand Environmental	Environmental Impact Assessment for the redevelopment of the Sea Point Pavilion site, Cape Town
2000	South Africa	City of Cape Town/ Southern Water Ecological Research and Consulting	Freshwater fish specialist on the Zeekoeivlei and Rondevlei restoration project.
2000	Africa	SURVAS	National representative on the SURVAS Network tasked with assessing Vulnerability & Adaptation to Impacts of Accelerated Sea-Level Rise in Africa.
1999-2000	South Africa	United States Department of Energy/	Assessment of the effects of climate change on marine biodiversity in South Africa.

Period	Country	Client	Project, Tasks
		Department of Environmental Affairs and Tourism, South Africa	
1999-2000	South Africa	Foundation for Research Development	Assessment of impacts of exploitation of wonderworm <i>Marphysa sanguinea</i> on bouldershore habitats on the Cape Peninsula, South Africa.
1999-2000	South Africa	Department of Environmental Affairs & Tourism, South Africa	National Co-ordinator of the Subsistence Fisheries Programme designed to identify subsistence fishing communities in South Africa, to assess socio-economic profiles and resource harvesting techniques and to provide recommendations for the implementation of appropriate management systems for these fishers.
1999	South Africa	Ridge Management/ Eric van den Honert Environmental Consulting	Environmental Impact Assessment for for the Soetwater Mariculture Project (an abalone and seaweed aquaculture initiative) on the marine environment.
1999	South Africa	City of Cape Town/ Southern Water Ecological Research and Consulting	Environmental Impact Assessment for the construction of a foot bridge over the Zandvlei estuary.
1999	South Africa	City of Cape Town/ Southern Water Ecological Research and Consulting	Environmental Impact Assessment for flood mitigation measures (artificial wetland) on the Silvermine estuary.
1999	South Africa	City of Cape Town/ Freshwater Consulting Group	Fish specialist appointed to assess the ecological importance of Zoarvlei (a freshwater wetland) for marine, estuarine and freshwater fish species.
1999	South Africa	City of Cape Town/ Southern Water Ecological Research and Consulting	Environmental Impact Assessment for upgrading the Zandvleit Wate Water Treatment Works on the Eerste estuary.
1999	South Africa	Jakobsbaai Abalone Farm	Assessment of the application of anolytes to control red-tide dinoflagellates <i>Scripsiella trochoidea</i> in the mariculture industry.
1999	South Africa	Southern Water Ecological Research and Consulting	Guidelines for stocking Capricorn Lake (a shallow dendritic lake in the Capricorn Science and Business Park Lake) with fish
1998-1999	Mozambique	ARCO International Oil and Gas Company/ Austral	Environmental Impact Assessment for onshore and offshore seismic exploration and exploratory drilling for oil and gas in Sofala Bay (Beira) area in Mozambique.
1998-	South Africa/	GEF/UNDP/	Production of an "Integrated Overview of Diamond

Period	Country	Client	Project, Tasks
1999	Namibia/ Angola	Benguela Current Large Marine Ecosystem Programme (BCLME)	Mining in the Benguela Current Region” as part of the synthesis and assessment of information on the Benguela Current Large Marine Ecosystem (BCLME) project.
1998	Namibia	Government of Namibia/ Desert Research Foundation of Namibia	Environmental Impact Assessment for a new Fishing Port at Möwe Bay, Skeleton Coast, Namibia.
1998	Namibia	Namdeb Diamond Company	Environmental Impact Assessment for the Elizabeth Bay Mine, Lüderitz, Namibia.
1998	South Africa	Marine Diamond Mines Association/ Sue Lane & Robin Carter & Associates	Generic Environmental Baseline Report on the status of the marine environment, fisheries and coastal utilisation in the South African west coast marine diamond ‘a’ concession areas, surf zone and admiralty strip.
1998	South Africa	Blaauberg Municipality/ World Wide Fund for Nature (WWF- SA)	Assessment of the intensity and impact of bait collecting activities on the ecology of the Diep River estuary, South Africa.
1998	South Africa	De Beers Namaqualand/Gib b Africa	Environmental Impact Assessment for the construction of a bridge across the Buffels estuary near Kleinzee.
1997- 2012	Namibia	Namdeb Diamond Company	Baseline and Environmental Impact Assessment for beach diamond mining in the Bogenfels Mining Licence Area in the Sperrgebiet, Namibia. Sequential appointment for studies undertaken in 1997, 1998, and annually from 2004-2011.
1997- 1998, 2000- 2001, 2009- 2011	South Africa	Department of Environmental Affairs & Tourism/ Department of Agriculture, Forestry & Fisheries	Implementation of an offshore, boat-based fisheries monitoring programme designed to supply and deploy aboard fishing vessels, competent, suitably trained and equipped scientific observers for the offshore trawl, inshore trawl, hake longline and west coast rock lobster fisheries.
1997- 1998	South Africa	Foundation for Research Development/ University of Cape Town	Assessment of the enhanced utilisation and management of demersal fish resources off the east, south and west coasts of South Africa.
1997	United Arab Emirates	Adnoc-Borealis Petrochemicals/M artin Mid-East	Environmental Impact Assessment and Baseline Survey for a new petro-chemicals plant in Dubai, UAE.
1996	South Africa	Rein's Nature Reserve	Assessment of the status of exploited marine species in a small marine reserve near Mossel Bay, South Africa.
1994-	South Africa	Sea Fisheries	Assessment of the impact of commercial beach-

Period	Country	Client	Project, Tasks
1996		Research Institute/ World-wide Fund for Nature (SA)	seine netting on the fish and invertebrates in False Bay, South Africa.
1990	South Africa	Seafarm Products	Assessment of the impact of fish predation on the cultured mussel, <i>Mytilus galloprovincialis</i> , in the Seafarm Dam, South Africa.

PUBLICATION RECORD

Thesis

Clark, B.M. 1997. Dynamics and utilization of surf zone habitats by fish in the south-western Cape, South Africa. PhD Thesis, University of Cape Town, 216 pp.

Scientific papers

- Clark, B.M. 2009. Introduction – The Berg River Baseline Monitoring Programme. Transactions of the Royal Society of South Africa 64(2): 95,
- Clark, B.M. & S. Taljaard. 2009. Historic changes in inorganic nutrient loading and its effects on water quality biota of the Berg estuary, South Africa. Transactions of the Royal Society of South Africa 64(1) In press
- Clark, B.M., Hutchings, K. & Lamberth, S.J. 2009. Long-term variations in composition and abundance of fish in the Berg estuary, South Africa. Transactions of the Royal Society of South Africa 64(2): 238–258.
- Clark, B.M., Impson, D. & J. Rall. 2009. Present status and historical changes in the fish fauna of the Berg River, South Africa. Transactions of the Royal Society of South Africa 64(2): 142–163
- Clark, B.M. 2005. Climate change: A looming challenge for fisheries management in southern Africa. Marine Policy 30 (1): 84-95.
- Clark, B.M., Hauck, M., Harris, J., Salo, K. and E. Russell. 2002. Identification of subsistence fishers, fishing areas, resource use and activities. South Africa Journal of Marine Science 24: 425-438.
- Clark, B.M. 1996. Variation in surf zone fish community structure across a wave exposure gradient. *Est. cstl. Shelf Sci.* 44: 659-674.
- Clark, B.M. 1996. Marine diamond mining activities off Namibia: do they really pose a threat to island biota? *S.A. Comm. Mar.* 5(3): 16.
- Clark, B.M. & B.A. Bennett 1993. Are juvenile fish an issue in the trek net controversy? *Fish, fishers and fisheries, Proc. 2nd Mar. Recreational Angling Symp., Durban, October 1992.* Beckley, L.E. & R.P. van der Elst (eds.) *Spec. Publ. oceanogr. Res. Inst. S. Afr.* 2: 157-159.
- Clark, B.M., B.A. Bennett & S.J. Lamberth 1994. A comparison of the ichthyofauna of two estuaries and their adjacent surf-zones, with an assessment of the effects of beach-seining on the nursery function of estuaries for fish. *S. Afr. J. mar. Sci.* 14: 121-131.
- Clark, B.M., B.A. Bennett & S.J. Lamberth 1994. Assessment of the impact of commercial beach-seine netting on juvenile teleosts in the surf-zone of False bay, South Africa. South Africa Journal of Marine Science 14: 255-262.
- Clark, B.M., B.A. Bennett & S.J. Lamberth 1996. Factors affecting spatial variability in seine net catches of fish in the surf-zone of False Bay, South Africa. *Mar. Ecol. Prog. Ser.* 131: 17-34.
- Clark, B.M., B.A. Bennett & S.J. Lamberth 1996. Temporal variations in surf-zone fish assemblages from False Bay, South Africa. *Mar. Ecol. Prog. Ser.* 131: 35-47.

- Branch, G.M. and **Clark, B.M.** 2006. Fish stocks and their management: The changing face of fisheries in South Africa. *Marine Policy* 30 (1): 3-17.
- Hutchings, K., **Clark, B.M.**, Atkinson, L.J. & C. G. Attwood. 2008. Evidence of recovery of the linefishery in the Berg River Estuary, Western Cape, South Africa, subsequent to closure of commercial gillnetting. *African Journal of Marine Science* 2008, 30 (3): 507–517.
- Napier V.R., J.K. Turpie & **B.M. Clark**. 2009. Value and management of the subsistence fishery at Knysna estuary, South Africa. *African Journal of Marine Science* In press
- Branch, G.M., May, J., Roberts, B., Russell, E., **Clark, B.M.** 2002. Case studies on the socio-economic characteristics and lifestyles of subsistence and informal fishers in South Africa. *South Africa Journal of Marine Science* 24: 439-462.
- Cockroft, A.C., Sauer, W., Branch G.M., **Clark, B.M.**, Dye, A. H. and E. Russell. 2002 - Assessment of resource availability and sustainability for subsistence fishers in South Africa with a review of resource management procedures. *South Africa Journal of Marine Science* 489-502.
- Griffiths, C. L., L. van Sittert, P. B. Best, A. C. Brown, **B.M. Clark**, P. A. Cook, R. J. M. Crawford, J. H. M. David, B. R. Davies, M. H. Griffiths, K. Hutchings, A. Jerardino, N. Kruger, S. Lamberth, R. Leslie, R. Melville-Smith, R. Tarr & C. D. van der Lingen, 2004. Impacts of human activities on marine animal life in the Benguela – An historical overview. *Oceanogr. Mar. Biol. Ann. Rev.* 42, 303-392.
- Harris, J.M., Branch, G.M., **Clark, B.M.**, Coetzee, C., Dye, A.H., Hauck, M., Johnson, A., Kati-Kati, L., SiqWano-Ndulo, N., and M. Sowman. 2002. Recommendations for the management of subsistence fishers in South Africa. *South Africa Journal of Marine Science* 24: 503-523.
- Harris, J.M., Sowman, M., Branch, G.M., **Clark, B.M.**, Cockroft, A.C., Coetzee, C., Dye, A.H., Hauck, M., Johnston, A., Kati-Kati, L., Maseko, Z., Salo, K., Sauer, W.H.H., Siqwana-Ndulo, N. and J. Beaumont. 2002. The process of developing a management system for subsistence fisheries in South Africa: recognizing and formalizing a marginalized fishing sector in South Africa. *South Africa Journal of Marine Science* 24: 405-424.
- Hauck, M., Sowman, M., Russel, E., **Clark, B.M.**, Harris, J.M., Venter, A., Beaumont, J. and Z. Maseko. 2002. Perceptions of subsistence and informal fishers in South Africa. *South Africa Journal of Marine Science* 24: 464-474
- Lamberth, S.J., B.A. Bennett & **B.M. Clark** 1994. The catch composition of commercial beach-seine fishermen in False Bay, South Africa. *S. Afr. J. mar. Sci.* 14: 69-78.
- Lamberth, S.J., B.A. Bennett & **B.M. Clark** 1995. The vulnerability of fish to capture by commercial beach-seine nets in False Bay, South Africa. *S. Afr. J. mar. Sci.* 15: 25-31.
- Lamberth, S.J., B.A. Bennett & **B.M. Clark** 1995. Seasonality of beach-seine catches in False Bay, South Africa, and implications for management. *S. Afr. J. mar. Sci.* 15: 157-167.
- Lamberth, S.J., B.A. Bennett & **B.M. Clark** 1995. The impact of beach-seine netting on the benthic fauna and flora of False Bay, South Africa. *S. Afr. J. mar. Sci.* 15: 157-167.
- Lamberth, S.J., Bennett, B.A. & **B.M. Clark**. 1995. It's nothing new. *S.A. Comm. Mar.* 2(4): 29.

- Lamberth, S.J. & **B.M. Clark**. 1995. Attempts to resolve the conflict between recreational anglers and beach-seine fishermen in False Bay, South Africa. In: *Proc. 1st Pan African Fisheries Congress, Nairobi, Kenya, July-August 1995. Fish Manage. Ecol.*
- Lamberth SJ, Branch GM & **BM Clark** 2010. Estuarine refugia and fish responses to a large anoxic, hydrogen sulphide, “black tide” event in the adjacent marine environment. *Est. cstl. Shelf Sci.* 86: 203-215
- Lamberth, S.J., W.H.H. Sauer, B.Q. Mann, S.L. Brouwer, **B.M. Clark** & C. Erasmus. 1997. The current status of the South African beach-seine and gill-net fisheries. *S. Afr. J. mar. Sci.* 18: 195-202
- Napier, V.R., Turpie, J.K. & **B.M. Clark**. 2009. Value and management of the subsistence fishery at Knysna Estuary, South Africa. *African Journal of Marine Science* 31(3): 297–310.
- Parker, D., Kerwath, S.E., Næsje, T.F., Arendse, C.J., Keulder-Stenevik, F.J., Hutchings, K. , **Clark, B.M.**, Winker, H, Cowley, P.D. and CG Attwood. 2017. When plenty is not enough: an assessment of the white stumpnose (*Rhabdosargus globiceps*) fishery of Saldanha Bay, South Africa. *African Journal of Marine Science* 2017, 39(2): 153–166.
- Solanofernández, S., Attwood, C.G., Chalmers, R. **Clark, B.M.**, Cowley, P.D., Fairweather, T., Fennessy, S.T., Götz, A., Harrison, T.D., Kerwath, S.E., Lamberth, S.J., Mann, B.Q., Smale M.J. & L. Swart. 2012. Assessment of the effectiveness of South Africa's marine protected areas at representing ichthyofaunal communities. *Environmental Conservation* 39 (03): 259-270

Books/Book Chapters

- Turpie, J., **Clark, B.M.**, Knox, D., Martin, P., Pemberton, C. & C Savy. 2004. Contributions to Information Requirements for the Implementation of Resource Directed Measures for Estuaries. Volume 1. Improving the biodiversity importance rating of South African estuaries. JB Adams (Ed.). Report to the Water Research Commission by the Consortium for Estuarine Research and Management. WRC Report No. 1247/1/04.
- De Villiers CC, Brownlie S, **Clark B.M.**, Day EG, Driver A, Euston-Brown DIW, Helme NA, Holmes PM, Job N, Rebelo AB (2005) Fynbos Forum Ecosystem Guidelines for Environmental Assessment in the Western Cape. Fynbos Forum and Botanical Society of South Africa, Kirstenbosch. ISBN 0-620-35258-2
- Harris, J.M., Branch, G.M., **Clark, B.M.** & S.C. Sibiya. 2007. Redressing Access Inequities and Implementing Formal Management Systems for Marine and Estuarine Subsistence Fisheries in South Africa. In: T.R. McClanahan and J.C. Castilla (eds.) *Fisheries Management: Progress towards Sustainability*. Blackwell Press, pp. 112-138.
- Niang, I., Nyong, A., **Clark, B.M.**, Desanker, P., Din, N., Githeko, A., Jalludin, M., Osman, B. (2007) Vulnerability, Impacts and Adaptation to Climate Change. In: Otter, L., Olago, D.O. and Niang, I. (eds) *Global Change Processes and Impacts in Africa: A Synthesis*. START/East African Educational Publishers, Nairobi, pp. 226-249.

CURRICULUM VITAE

VERA MASSIE

ACADEMIC QUALIFICATIONS:

MSc Conservation Biology, 2013, University of Cape Town

BSc (Hons) Environmental Management, 2011, University of Cape Town

BSc Marine Biology and Environmental Science, 2010, University of Cape Town

LANGUAGE PROFICIENCY:

English (excellent), Afrikaans (basic), German (first language), Japanese (good, spoken)

POSTAL ADDRESS: 8 Steenberg House, Silverwood Close, Tokai 7945

PHONE: +27-21-7013420

E-MAIL: vera@anchorenvironmental.co.za

FAX: +27 (0)-21-7015280

EMPLOYMENT HISTORY: 2013-Present – Consultant, Anchor Environmental Consultants (Pty) Ltd
2012 – Marine ecology research field assistant
2010-2012 – Research laboratory assistant (water quality analysis)

MEMBERSHIPS: South African Association of Professional Natural Scientists (Registration number: 119542)

SUMMARY PROFILE

Vera earned degrees in conservation biology, marine biology and environmental management from the University of Cape Town and has more than six years of experience as an environmental consultant. Her training has equipped her to consult on research projects incorporating the maintenance and conservation of marine and estuarine ecosystems. She also consults on the biophysical, socio-economic and legal aspects in the assessment of human impacts on coastal, terrestrial and aquatic environments in the temperate and tropical regions of South Africa. Working at Anchor Environmental Consultants, she has gained experience in drafting environmental legislation, preparing guidelines and developing frameworks to facilitate successful implementation of legislation. Many of her projects involve the monitoring and evaluation of compliance with a variety of environmental laws, their associated regulations and environmental permits across varying economic sectors.

PROJECT EXPERIENCE

Period	Client	Project	Tasks	Aspects
2019-2020	Planet Capital (ongoing)	Proposed Land-based Aquaculture Facility on the West Coast of South Africa	<ul style="list-style-type: none"> • Assistance with the Basic Assessment process • Ornithological study 	<ul style="list-style-type: none"> • Stakeholder consultation • Basic Assessment Report • Ornithological impact assessment
2018-2022	Mhlathuze Water (ongoing)	Marine environment impact assessment effluent pipelines in Richards bay	<ul style="list-style-type: none"> • Toxicity testing 	<ul style="list-style-type: none"> • Sea urchin fertilisation toxicity tests • Laboratory work • Analysis of data • Reporting and management recommendations
2018-2020	DAFF (ongoing)	Basic Assessment Process for a proposed Aquaculture Development Zone in Algoa Bay, Eastern Cape	<ul style="list-style-type: none"> • Basic Assessment Process • Submit application for Environmental Authorisation 	<ul style="list-style-type: none"> • Description of environment and proposed development; • Environmental impact assessment; • Site visit; • Public participation;
2018	The Biodiversity Company	Seawater Toxicity Testing of mining effluent	<ul style="list-style-type: none"> • Toxicity testing on various taxa 	<ul style="list-style-type: none"> • Laboratory work • Data analysis • Scientific report preparation
2018-2019	DAFF	Biodiversity Risk and Benefit Assessment for the cultivation of Nile Tilapia in Nandoni Dam and in the Dzindi Nature Reserve	<ul style="list-style-type: none"> • Prepare a risk assessment in terms of the NEMBA Alien and Invasive Species Regulations 	<ul style="list-style-type: none"> • Alien invasive species research • Ensure compliance with NEMBA • Site visit
2018-2019	Port Nolloth Sea Farms Ranching	Basic Assessment process for an abalone holding facility near Kleinsee in the Northern Cape	<ul style="list-style-type: none"> • Basic Assessment Process • Submit application for Environmental Authorisation • Assist with other environmental licensing requirements 	<ul style="list-style-type: none"> • Description of environment and proposed development; • Environmental impact assessment; • Site visit; • Public participation;
2017	Nsovo Environmental Consulting	Environmental Impact Assessment for the proposed upgrade of the stormwater management system in the Port of Saldanha, South Africa	<ul style="list-style-type: none"> • Terrestrial impact assessment 	<ul style="list-style-type: none"> • Description of the proposed activity • Description of the receiving environment • Assessment of Impacts • Recommendations
2017-2019	Diamond Coast Aquaculture	Basic Assessment process for the expansion of an existing aquaculture farm near Kleinsee in the Northern Cape.	<ul style="list-style-type: none"> • Basic Assessment Process • Submit application for Environmental Authorisation • Assist with other environmental licensing requirements 	<ul style="list-style-type: none"> • Description of environment and proposed development; • Environmental impact assessment; • Marine specialist study; • Site visit; • Public participation;
2017	Geo Pollution Technologies	Assistance with the registration of a water use in terms of the National Water Act (Act No. 36 of 1998) for a proposed BP Fuel Station	<ul style="list-style-type: none"> • Assistance in completing technical information of applicable registration forms; • Complete Risk 	<ul style="list-style-type: none"> • Compilation of ecological information (imperial and literature) on the affected watercourse; • Conduct a field visit;

Period	Client	Project	Tasks	Aspects
			<ul style="list-style-type: none"> Assessment Matrix Source the Worcester Dam Safety Plan from the Breede Valley Municipality; 	
2017	ABT Energy and Oil	Compilation of an Environmental Management Programme required in terms of the Wholesale New License issued to ABT Energy and Oil in terms of the Petroleum Products Act, 1977 (Act No. 120 of 1977) (as amended)	<ul style="list-style-type: none"> Compilation of an Environmental Management Programme for a diesel storage and handling facility 	<ul style="list-style-type: none"> Description of the affected environment Impact assessment Environmental management programme Financial provision for remediation Public participation
2016-2017	Department of Environmental Affairs	Update of the 1995/1996 South African Water Quality Guidelines for the Marine Environment	<ul style="list-style-type: none"> Review and analyse the 1995/1996 guidelines Review guidelines/standards adopted in other countries Derive new water quality guideline values for seawater properties and constituents (physical and chemical variables). 	<ul style="list-style-type: none"> Literature review of relevant physical and chemical variables Summary profiles for each variables (description, sources, fate in the environment, interaction with other variables, mode of toxicity, occurrence in South Africa) Stakeholder and expert workshop
2014-2017	Saldanha Bay Water Quality Trust	The State of Saldanha Bay and Langebaan Lagoon	<ul style="list-style-type: none"> Ongoing annual ecological monitoring of Saldanha Bay and Langebaan Lagoon 	<ul style="list-style-type: none"> Compliance monitoring (water quality) Environmental law and management Field research Data analysis
2016-2017	Abagold Ltd	Prepare and guide application for amendment of Environmental Authorisation	<ul style="list-style-type: none"> Prepare a Risk Assessment to assess environmental impacts due to changes to the Abagold combined abalone and seaweed facility since the EA was granted in 2009 Prepare application for amendment of Environmental Authorisation in terms of NEMA Conduct public participation Handle potential appeals by interested and affected parties 	<ul style="list-style-type: none"> Establish compliance in terms of NEMA Stakeholder liaison
2016	Myezo Environmental Management Services	West Coast Resources Namaqualand Mines Environmental Impact Assessment Estuarine Specialist Study	<ul style="list-style-type: none"> Prepare an Estuarine Specialist Study for the Swartlintjies Estuary 	<ul style="list-style-type: none"> Field research Data analysis Impact Assessment
2016	ACC South Africa	Preparation of a permit application and associated risk	<ul style="list-style-type: none"> Prepare a risk assessment in terms of the NEMBA Alien and 	<ul style="list-style-type: none"> Alien invasive species research Ensure compliance with

Period	Client	Project	Tasks	Aspects
		assessment for the introduction and growing of <i>Camelina sativa</i> in South Africa	<p>Invasive Species Regulations</p> <ul style="list-style-type: none"> • Submit an application for a permit in terms of NEMBA Section 65(1) 	NEMBA
2014-2016	Transnet	Baseline environmental monitoring study for the expansion of Berth 203-205 in the Port of Durban	<ul style="list-style-type: none"> • Quarterly ecological monitoring of the Port of Durban 	<ul style="list-style-type: none"> • Field research • Data analysis • Statistical analysis
2016	Overstrand Municipality and Onrus Lagoon Preservation Trust	Preparation of an estuary management plan for the Onrus Estuary	<ul style="list-style-type: none"> • Compile Situation Assessment Report • Compile Estuary Management Plan • Conduct public participation • Assist in setting up an Estuary Management Forum • Stakeholder consultation report 	<ul style="list-style-type: none"> • Legislation review and application • Management strategies • Zonation plans • Stakeholder liaison
2016	Jeffares and Green Engineering and Environmental Consulting	Marine and Estuarine Ecological Impact Assessment of the Dredge Footprint, Infill Area and Offshore Disposal Site for the Proposed Container Terminal at Pier 1, Port of Durban	<ul style="list-style-type: none"> • To collect biological data to inform a marine and estuarine impact assessment 	<p>Contributions to:</p> <ul style="list-style-type: none"> • Field research • Impact assessment
2015-2016	Mossel Bay Municipality	Preparation of an estuary management plan for the Hartenbos Estuary	<ul style="list-style-type: none"> • Compile Situation Assessment Report • Compile Estuary Management Plan • Conduct public participation • Assist in setting up an Estuary Management Forum • Stakeholder consultation report 	<ul style="list-style-type: none"> • Legislation review and application • Management strategies • Zonation plans • Stakeholder liaison
2015	AquaTech	Risk assessment for in-water hull cleaning operations in the Port of Durban, South Africa	<ul style="list-style-type: none"> • Establish the environmental risks associated with the in-water diver operated vessel hull cleaning device (water quality and biological invasion) 	<ul style="list-style-type: none"> • Risk assessment • Compliance in terms of NEMBA
2015	Chevron	Prepare a marine specialist study for a Coastal Waters Discharge Permit Application	<ul style="list-style-type: none"> • Describe the marine environment • Assess impacts on marine environment 	<ul style="list-style-type: none"> • Compliance in terms of ICMA
2015	Department of Environmental Affairs	Development of an assessment framework for management of effluent discharged from land-based sources to the marine environment in South Africa	<ul style="list-style-type: none"> • Review of international legislation, guidelines and management practice • Design an assessment framework tailored to the South African context • Workshop with government 	<ul style="list-style-type: none"> • Review of international legislation • Research on effluent and contaminant types and their impacts on the environments • Research technical aspects of near-field and far-field modelling of effluent in the

Period	Client	Project	Tasks	Aspects
			departments and I&APs	receiving environment <ul style="list-style-type: none"> Implementation of the Integrated Coastal Management Act
2014	CEN Integrated Environmental Management Unit	Specialist Marine Impact Assessment for Discharge of Treated Sewage Effluent into the Sea at Cape Recife, Port Elisabeth	<ul style="list-style-type: none"> Describe the marine environment Assess impacts on marine environment 	<ul style="list-style-type: none"> Field research
2014	Molapong Aquaculture	Risk Assessment for culture of King and Coho salmon in South Africa	<ul style="list-style-type: none"> Prepare a risk assessment in terms of the NEMBA Alien and Invasive Species Regulations 	<ul style="list-style-type: none"> Alien invasive species research Ensure compliance with NEMBA
2014	AquaConcepts	Risk assessment for import of ornamental marine fish species into South Africa	<ul style="list-style-type: none"> Provide assistance in obtaining relevant licenses and rights and ensure that the business is in compliance with the MLRA and NEMBA. Complete a Risk Assessment for the facility. 	<ul style="list-style-type: none"> Ensure compliance with various environmental legislation
2014	SRK Consulting	Marine Ecology Screening Report for Proposed Abalone Aquaculture Farms at Doringbaai, West Coast, South Africa	<ul style="list-style-type: none"> Describe the marine environment Assess impacts on marine environment 	<ul style="list-style-type: none"> Contributions to the description of the environment Legal requirements in terms of the National Environmental Management Biodiversity Acts (NEMBA)
2014	CapeNature	Rezoning and realignment of borders for Betty's Bay, Goukamma and Robberg marine protected areas in South Africa	<ul style="list-style-type: none"> Manage the stakeholder participation process Produce a stakeholder consultation report 	<ul style="list-style-type: none"> Stakeholder liaison Implementation of environmental legislation
2013	iSimangaliso Wetland Park Authority	GEF Grant No. TF096152: Development, Empowerment and Conservation in the iSimangaliso Wetland Park and Surrounding Region	<ul style="list-style-type: none"> Component 1: Analysis of alternatives to determine the most feasible solution to the hydrological issues of the Lake St Lucia estuarine system – Baseline Socio-economic Assessment 	<ul style="list-style-type: none"> Data analysis
2013	Department of Environmental Affairs and Development Planning	Develop Norms and Standards for land-based abalone and trout aquaculture and implementation guidelines	<ul style="list-style-type: none"> Prepare Norms and Standards for both sectors Prepare implementation guidelines for both sectors 	<ul style="list-style-type: none"> Drafting of legislation Identify all environmental impacts associated with land-based abalone and trout aquaculture Develop norms and standards for the management of these sectors

PUBLICATION RECORD

Scientific papers

Milandri, SG, KJ Winter, SBM Chimphango, NP Armitage, DN Mbui, GE Jackson and V Liebau. 2012.
The performance of plant species in removing nutrients from stormwater in biofiltration systems in Cape Town. *Water SA*, 38(5): 655-652.

CURRICULUM VITAE OF SONGEZO MTSOKOBA

Academic qualification:

- BTech in Environmental Management (2017)
- National Diploma: Environmental Management (2014)

Employment:

- February 2018 – current, Anchor Environmental Consultants – Laboratory technician and field assistant
- March-September 2017, Anchor Environmental Consultants – Internship
- 01 May 2015 to 28 February 2017, Wastewater treatment works at Riebeeck West prison under department of Public works – Water care internship
- January 2014 to July 2014, Work Integrated Learning (in-service training).

Languages: Isixhosa and English

Contact details:

Phone: 021 701 3420

Email address: songezo@anchorenvironmental.co.za

Summary Profile

Songezo earned a National Diploma and Btech in environmental management from the Cape Peninsula University of Technology. His training equipped him to understand various aspects of the environment and to identify significant impacts on the environment and human health. Working at Anchor Environmental Consultants, he has gained experience in the field of environmental management. Furthermore, as a laboratory technician and field assistant, he gained specialised skills, which include sediment particle size distribution analysis using a Horiba Laser Particle Size Analyser. More recently he has been undergoing training in benthic macrofauna taxonomy. He regularly provides assistance in the field for marine, estuarine and coastal environmental baseline and monitoring projects required to ensure compliance with environmental laws and their associated regulations across varying economic sectors.

Work experience

Institution	Position	Experience
<p>Anchor Environmental Consultants – 1 February 2018 to current</p>	<p>Laboratory technician and field assistant</p>	<p><u>Specialised skills:</u> Operating Horiba Lazer Particle Size Analyser: Sediments analyses.</p> <p>Taxonomy: Identification and filing of invertebrate samples and specimens.</p> <p><u>Field surveys:</u> De Beers Marine Benthic sampling campaign: Grabbing benthic samples in mined and unmined areas (2018 survey)</p> <p><u>Basic Assessment process in terms of the National Environmental Management Act (Act No 108 of 1998):</u> Algoa Bay Sea-Based Aquaculture Development Zone public participation process.</p>
<p>Anchor Environmental Consultants – 1 March 2017 – September 2017</p>	<p>Internship</p>	<p><u>Laboratory technician</u> Sorting and preserving benthic macrofauna samples. Cataloguing benthic macrofauna specimens.</p> <p><u>Field assistant</u> In situ water quality analysis using a HACH water quality meter;</p> <ul style="list-style-type: none"> • Collect water quality samples for laboratory analysis; • Description of the affected watercourse; <p><u>Environmental management</u> Training in identification of potential environmental impacts for aquaculture farms.</p> <p>Basic Assessment procedure for Diamond Coast Aquaculture Development (Application for Environmental Authorization).</p>

<p>Wastewater treatment works at Riebeeck West prison under department of Public works.</p> <p>01 May 2015 to 28 February 2017 (2 years contract).</p>	<p>Water care intern</p>	<p>Monitoring and operation of wastewater treatment plant. Data collection, taking readings, PH testing and turbidity.</p>
<p>Cape Peninsula University of Technology January 2014 to July 2014.</p>	<p>Work Integrated Learning (in-service training).</p>	<p>Energy Efficiency project within Cape Town campus.</p>

