



**DRAFT**

**ENVIRONMENTAL  
MANAGEMENT PROGRAMME  
(EMPR)**



**OCEAS** |

ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

**KEI MOUTH ECO ESTATE,  
EASTERN CAPE PROVINCE**

DEA REF:

**DRAFT ENVIRONMENTAL MANAGEMENT  
PROGRAMME (EMPR)**

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# 1 INTRODUCTION

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## 1.1 OBJECTIVES OF AN EMPr

This EMPr has been compiled to provide recommendations and guidelines according to which compliance monitoring can be done during the construction and operation of the road upgrade and re-alignment. The objective of the EMPr is also to ensure that all relevant factors are considered to ensure environmentally responsible development (Figure 1). The purpose of the EMPr is to provide specifications for "good environmental practice" for application during these phases.

This EMPr informs all relevant parties, which are in this case, the Project Coordinator, the Contractor, the Environmental Control Officer (ECO) and all other staff employed by the Developer (Lutuli Ranches CC) at the site as to their duties in the fulfilment of the legal requirements for the construction and operation of the road upgrade with particular reference to the prevention and mitigation of anticipated potential environmental impacts.

All parties should note that obligations imposed by the EMPr are legally binding in terms of the environmental authorisation granted by the relevant environmental permitting authority.

The objectives of an EMPr are to:

- Ensure compliance with regulatory authority stipulations and guidelines which may be local, provincial, national and/or international;
- Ensure that there is sufficient allocation of resources on the project budget so that the scale of EMPr-related activities is consistent with the significance of project impacts;
- Verify environmental performance through information on impacts as they occur;
- Respond to unforeseen events;
- Provide feedback for continual improvement in environmental performance;
- Identify a range of mitigation measures which could reduce and mitigate the potential impacts to minimal or insignificant levels;
- Detail specific actions deemed necessary to assist in mitigating the environmental impact of the project;
- Identify measures that could optimize beneficial impacts;
- Create management structures that address the concerns and complaints of I&APs with regards to the development;
- Establish a method of monitoring and auditing environmental management practices during all phases of the activity;
- Ensure that safety recommendations are complied with; and
- Specify time periods within which the measures contemplated in the final environmental management programme must be implemented, where appropriate.



## 1.2 STRUCTURE AND FUNCTION OF AN EMPr

An EMPr is focused on sound environmental management practices, which will be undertaken to minimise adverse impacts on the environment through the lifetime of a development. In addition, an EMPr identifies what measures will be in place or will be actioned to manage any incidents and emergencies that may occur during operation of the project.

As such the EMPr provides specifications that must be adhered to in order to minimise adverse environmental impacts associated with the construction and operation of the road upgrade and bridge construction. The content of the EMPr is consistent with the requirements as set out in Appendix 4 of the EIA regulations stated below, for the construction and operation phases.

**According to APPENDIX 4 of GN R 326, an environmental management programme must include:**

- (a) Details of –
  - (i) The EAP who prepared the environmental management programme; and
  - (ii) The expertise of the EAP to prepare an environmental management programme, including a curriculum vitae;
- (b) A detailed description of the aspects of the activity that are covered by the draft environmental management programme as identified by the project description;
- (c) A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;
- (d) Information on any proposed management or mitigation measures that will be taken to address the environmental impacts that have been identified in a report contemplated by these Regulations, including environmental impacts or objectives in respect of –
  - (i) Planning and design;
  - (ii) Pre-construction;
  - (iii) construction activities;
  - (iv) Rehabilitation of the environment after construction and where applicable post closure; and
  - (v) where relevant, operation activities;
- (e) a description and identification of impact outcomes required for the aspects contemplated in (d).
- (f) a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable include actions to –
  - (i) Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;
  - (ii) Comply with any prescribed environmental management standards or practices;
  - (iii) Comply with any applicable provisions of the Act regarding closure, where applicable;
  - (iv) Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;
- (g) The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);



- (h) The frequency of monitoring the implementation of the impact management actions contemplated in (f);
- (i) An indication of the persons who will be responsible for the implementation of the impact management actions;
- (j) The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;
- (k) The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);
- (l) A program for reporting on compliance, taking into account the requirement as prescribed by the regulations;
- (m) An environmental awareness plan describing the manner in which –
  - (i) The applicant intends to inform his or her employees of any environmental risk which may result from their work; and
  - (ii) Risks must be dealt with in order to avoid pollution or the degradation of the environment; and
- (n) Any specific information that may be required by the competent authority.

### 1.3 LEGAL REQUIREMENTS

Construction must be according to the best industry practices, as identified in the project documents. This EMPr, which forms an integral part of the contract documents, informs the Contractor as to his/her duties in the fulfilment of the project objectives, with particular reference to the prevention and mitigation of environmental impacts caused by construction activities associated with the project. The Contractor should note that obligations imposed by the approved EMPr are legally binding in terms of environmental statutory legislation and in terms of the additional conditions to the general conditions of contract that pertain to this project. In the event that any rights and obligations contained in this document contradict those specified in the standard or project specifications then the latter must prevail.

The Contractor must identify and comply with all South African national and provincial environmental legislation, including associated regulations and all local by-laws relevant to the project. Key legislation currently applicable to the construction and operation phases of the project must be complied with. The list of applicable legislation provided below is intended to serve as a guideline only and is not exhaustive:

- Constitution Act (No. 108 of 1996);
- National Environment Management Act (No. 107 of 1998, as amended, NEMA);
- National Environmental Management: Biodiversity Act (No. 10 of 2004; NEMBA);
- Environmental Management: Protected Areas Act (Act No. 57 of 2003; NEMPAA);
- National Water Act (No. 36 of 1998; NWA);
- National Environmental Management: Waste Management Act (No. 59 of 2008; NEMWA);
- National Heritage Resources Act (No. 25 of 1999; NHRA);
- Informal Land Rights Act (No. 109 of 1996; ILRA); and
- National Forestry Act, 1998 (No. 84 of 1998; NFA)



Policy and plans

- Amathole District Municipality Integrated Development Plan (ADM IDP, 2018/2019);
- Great Kei Local Municipality IDP (GKLM IDP, 2018/2019);
- GKLM Spatial Development Framework (SDF) and Strategic Environmental Assessment (SEA, 2006);
- Eastern Cape Biodiversity Conservation Management Plan (ECBCMP, 2007)



## 2 DETAILS OF THE ENVIRONMENTAL ASSESSMENT TEAM

According to APPENDIX 4 of GN R 982, an environmental management programme must include:

- (a) Details of –
  - (i) The EAP who prepared the environmental management programme; and
  - (ii) The expertise of the EAP to prepare an environmental management programme, including a curriculum vitae;

### 2.1 ENVIRONMENTAL CONSULTING COMPANY:

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CES was established in 1990 as a specialist environmental consulting company and has considerable experience in terrestrial, marine and freshwater ecology, the Social Impact Assessment (SIA) process, State of Environment Reporting (SOER), Integrated Waste Management Plans (IWMP), EMPs, Spatial Development Frameworks (SDF), public participation, as well as the management and co-ordination of all aspects of the EIA and Strategic Environmental Assessment (SEA) processes.

### 2.2 PROJECT TEAM:

- Dr Alan Carter (EAP); and
- Ms Caryn Clarke.

#### 2.2.1 Dr Alan Carter

Alan is the executive of the CES East London Office. He holds a PhD in Marine Biology and is a certified Public Accountant, with extensive training and experience in both financial accounting and environmental science disciplines with international accounting firms in South Africa and the USA. He has 25 years' experience in environmental management and has specialist skills in sanitation, coastal environments and industrial waste. Dr Carter is registered as a Professional Natural Scientist under the South African Council for Natural Scientific Professions (SACNASP). He is also registered as an EAP by the Environmental Assessment Practitioners of South Africa (EAPSA).



### 2.2.2 Ms Caryn Clarke

Caryn holds a M.Sc. degree in Environmental Science from Rhodes University. Her Master's dissertation investigated climate change adaptation strategies of vulnerable rural households in Willowvale and Lesseyton, Eastern Cape. Her professional interests include climate change policy, renewable energy and various environmental impact assessments. Caryn has worked on numerous basic assessments projects including various linear developments such as roads and pipelines. She has extensive public participation and stakeholder engagement experience. Caryn is a registered Candidate Natural Scientist under the South African Council for Natural Scientific Professions (SACNASP; No: 500022/14).

Refer to Appendix E for curriculum vitae.



## 3 PROPOSED ACTIVITY

**According to APPENDIX 4 of GN R 326, an environmental management programme must include:**

- (b) A detailed description of the aspects of the activity that are covered by the draft environmental management programme as identified by the project description;
- (c) A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;

### 3.1 DESCRIPTION OF PROPOSED ACTIVITY

CES was been appointed by Mr Robin Wood (c/o of Luthuli Ranches CC) to apply for Environmental Authorization (EA), in terms of the National Environmental Management Act (Act No. 107 of 1998; NEMA, as amended), for the proposed construction of the Kei Mouth Eco Estate.

The proposed development is located 7km from the coastal village of Kei Mouth in the Eastern Cape Province. The proposed development falls under the overall jurisdiction of the Amathole District Municipality and the Great Kei Local Municipality (see Figure 1.1 below).

The proposed Kei Mouth Eco Estate development (which will consist of Farms 73, 76, 79 Komga of the farm Rocky Ridge) relates to the establishment of a low density 50 high-income residential erven, two lodge sites each with a capacity of 100 beds and a recreational/boathouse facility. Internal strip roadways will be constructed between all residential erven, lodges and the recreational facility. Two suitable dam sites have been identified which will be developed concurrently with the installation of the bulk water infrastructure.

The proposed development will have the following activities:

- The consolidation, subdivision and rezoning of the 3 farms totalling about 599.2 Ha;
- The subdivision of portions of the consolidated area into approximately 68 erven (based on 1 unit per 10 Ha as recommended by the Great Kei Spatial Development Framework) and the rezoning of the 68 erven to Resort and Special Zone: Rural Residential;
- Holiday housing (development footprint of 4.6 Ha);
- Lodge and chalets (development footprint of 0.52 Ha);
- Services and roads (development footprint of 2 Ha); and
- Remaining area (approximately 577.1 Ha) to remain as agriculture but managed as a game farm.

The associated proposed activities include:



- The construction of distributed on-site sewage treatment units (development footprint of 0.09 Ha) and underground sewage reticulation;
- The construction of a network of internal roads (development footprint of 1.7 Ha); and
- The installation of underground water and electricity reticulation infrastructure.

Ultimately 3.7% of the consolidated area will be occupied by residential erven, lodges and chalets, and associated infrastructure (development footprint of less than 20 Ha), while 96.3% of the area will be set aside for conservation purposes.

The proposed development will take place in a phased manner, with all service infrastructure to be constructed within Phase 1 of the proposed development.

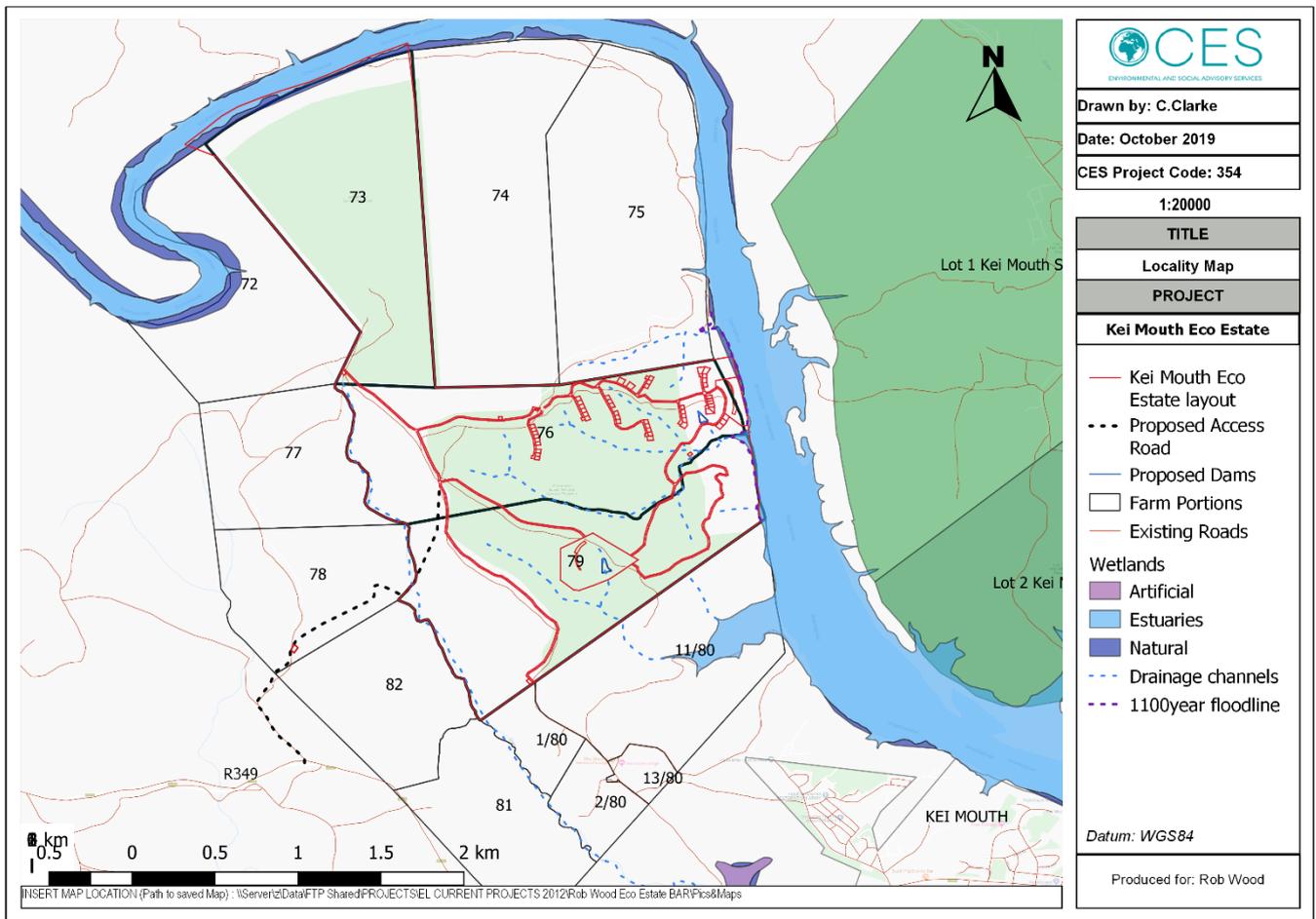


Figure 3-1: Locality Map



## 4 SCOPE OF THE EMPR

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In order to ensure a holistic approach to the management of environmental impacts during the construction and operation of the proposed road upgrade, this EMPr sets out the methods by which proper environmental controls are to be implemented by the Contractor and all other parties involved.

The EMPr is a dynamic document subject to influences and changes as are wrought by variations to the provisions of the project specification.

### 4.1 LAYOUT OF THE EMPR

The EMPr is divided into three phases of development. Each phase has specific issues unique to that period of the construction and operation. The impacts are identified and given a brief description. The phases of the development are identified as below:

#### 4.1.1 Planning and Design Phase

This section of the EMPr provides management principles for the planning and design phase of the project. Environmental actions, procedures and responsibilities as required from the Developer during the planning and design phase are specified. These specifications will form part of the contract documentation and therefore the Contractor will be required to comply with these specifications to the satisfaction of the Project Coordinator and ECO.

#### 4.1.2 Construction Phase

This section of the EMPr provides management principles for the construction phase of the project. Environmental actions, procedures and responsibilities as required during the construction phase are specified. These specifications will form part of the contract documentation and therefore the Contractor will be required to comply with these specifications to the satisfaction of the Project Coordinator and ECO.

#### 4.1.3 Operational and Maintenance Phase

This section of the EMPr provides management principles for the operation and maintenance phase of the project. Environmental actions, procedures and responsibilities as required from the Developer during the operation and maintenance phase are specified.



## 5 MITIGATION AND/OR MANAGEMENT MEASURES

According to APPENDIX 4 of GN R 326, an environmental management programme must include:

- (d) Information on any proposed management or mitigation measures that will be taken to address the environmental impacts that have been identified in a report contemplated by these Regulations, including environmental impacts or objectives in respect of –
  - (i) Planning and design;
  - (ii) Pre-construction;
  - (iii) construction activities;
  - (iv) Rehabilitation of the environment after construction and where applicable post closure; and
  - (v) where relevant, operation activities;
- (e) a description and identification of impact outcomes required for the aspects contemplated in (d).
- (f) a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable include actions to –
  - (i) Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;
  - (ii) Comply with any prescribed environmental management standards or practices;
  - (iii) Comply with any applicable provisions of the Act regarding closure, where applicable;
  - (iv) Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;



Table 5-1: Impacts and mitigation measures associated with the planning and design phase.

1 PLANNING AND DESIGN PHASE		
	ISSUE	MITIGATION MEASURES
1.1	<b>Relevant National Legislation and Policy</b>	<ul style="list-style-type: none"> <li>• The development must adhere to the relevant legislation and/or policy, e.g. ECBCP, Municipal By-laws, GKLM SEA &amp; SDFs, etc.</li> <li>• All legal matters pertaining to permitting must be completed prior to any construction activity.</li> <li>• All necessary Water Use Licenses must be in order for any construction activities within close proximity to a watercourse, as well as any additional water uses as per Section 21 of the National Water Act.</li> <li>• All relevant permits must be obtained from the competent authority in order to remove/relocate any protected plant species.</li> <li>• All necessary permits must be in place prior to the removal/destruction of any potential heritage or paleontological resources found on site, should it be required.</li> </ul>
1.2	<b>Scheduling of construction</b>	<ul style="list-style-type: none"> <li>• Sensitive riparian areas must be designated as No-Go areas.</li> <li>• Wherever possible, construction activities should be undertaken during the driest part of the year to minimize downstream sedimentation due to excavation, etc.</li> </ul>
1.3	<b>Stormwater and Erosion Management</b>	<ul style="list-style-type: none"> <li>• A Stormwater Management Plan must be developed by a qualified engineer and implemented during the construction and operation phase of the estate.</li> <li>• All necessary Water Use Licenses must be obtained prior to construction. The conditions contained within the Water Use license/s must be adhered to.</li> <li>• An Erosion Management Plan must be compiled during the planning and design phase, to be implemented during construction and operation of the proposed development</li> </ul>
1.4	<b>Waste Management</b>	<ul style="list-style-type: none"> <li>• A Waste Management Plan must be compiled during the planning and design phase, to be implemented during construction and operation of the proposed development</li> </ul>
1.5	<b>Sewage Package Plant Design &amp; Operation</b>	<ul style="list-style-type: none"> <li>• Ensure that the sewage package system is designed and implemented by a qualified engineer with input from geo-hydrologist, where required.</li> <li>• Sanitation systems should be located above 1:100-year flood line.</li> <li>• A water quality monitoring programme must be established to be implemented during the operation phase of the estate to ensure that the discharge treated effluent meets the required standards.</li> </ul>
1.6	<b>Rehabilitation &amp; Maintenance</b>	<ul style="list-style-type: none"> <li>• A Rehabilitation &amp; Maintenance Plan must be compiled during the planning and design phase, to be implemented during the construction and operational phase of the development.</li> <li>• The plan must detail measures that ensure the day-to-day operations of the development do not cause unnecessary degradation to the surrounding environment and to ensure on-going maintenance of all service infrastructure is undertaken at regular intervals to minimize risks to the surrounding environment.</li> </ul>
1.7	<b>Loss of natural and riparian vegetation</b>	<ul style="list-style-type: none"> <li>• The development footprint must be surveyed and demarcated prior to construction commencing to ensure that there is no unnecessary loss of natural vegetation outside the approved footprint.</li> <li>• The design and layout of the development and associated infrastructure must have as minimal impact on the natural vegetation as possible.</li> <li>• The placement of the estate buildings must be planned in such a way as to avoid intact thicket/bushland, as much as possible.</li> </ul>



1 PLANNING AND DESIGN PHASE		
	ISSUE	MITIGATION MEASURES
		<ul style="list-style-type: none"> <li>• Service infrastructure must follow the road reserve, as much as practically possible.</li> <li>• A Rehabilitation Plan must be developed during the pre-construction to include details on rehabilitating disturbed natural areas once construction has been completed.</li> <li>• An ECO must be appointed pre-construction to ensure that the pre-construction requirements area adhered to, i.e. walkthroughs conducted, and management plans are developed.</li> </ul>
1.8	<b>Loss of Species of Conservation Concern (SCC)</b>	<ul style="list-style-type: none"> <li>• A search and rescue walkthrough must be undertaken by a suitably qualified individual, pre-construction, to identify any potential plant SCC's located within the surveyed construction footprint. This must be undertaken with the ECO and Contractor/Developer present.</li> <li>• All relevant permits must be obtained from the competent authority prior to construction in order to remove/relocate any plant SCC's.</li> </ul>
1.9	<b>Inadequate protection of high conservation areas</b>	<ul style="list-style-type: none"> <li>• A Conservation Management Plan must be developed for the Eco Estate by a suitably qualified individual, which must include addressing issues such as: <ul style="list-style-type: none"> <li>• Identification of No-Go and sensitive areas, including the regulation of specific activities within such areas</li> <li>• Hunting</li> <li>• Inappropriate use of vehicles</li> <li>• Inappropriate stocking of game (e.g. overstocking and inappropriate species)</li> <li>• Introduction of dangerous animals</li> <li>• Types of vehicles that will be permitted in the conservation areas (i.e. of access roads)</li> <li>• Domestic pets</li> <li>• Vegetation and Alien species control and management</li> <li>• Fire control and veld burning</li> <li>• Fencing</li> <li>• Access control</li> </ul> </li> <li>• Having the remaining application area (particularly the portions towards the Great Kei River) proclaimed as a private nature reserve should be considered.</li> </ul>
1.10	<b>Control of alien invasive plant species</b>	<ul style="list-style-type: none"> <li>• During the planning and design phase, an Alien Vegetation Management Plan must be compiled to be implemented during construction and operation of the estate to reduce the establishment and spread of undesirable alien plant species.</li> </ul>
1.11	<b>Visual</b>	<ul style="list-style-type: none"> <li>• The development will largely be visible to rural developments on the former Transkei side of the Great Kei River and hidden from neighbouring farms. The design and construction of the development must therefore take into account the following: <ul style="list-style-type: none"> <li>• <b>Sighting and scale of structures:</b> <ul style="list-style-type: none"> <li>• Adopt appropriate environmentally and visually sensitive architectural and aesthetics code to limit visual intrusion of the built form.</li> <li>• Building heights for all clusters and lodges should preferably be restricted to single storey, and tucked into the landscape, to reduce the effect of ostentatious facades, given the visual exposure of the area. Exceptions may be necessary for focal buildings, or where space needs dictate.</li> <li>• The height of structures must be limited to a maximum of two stories where development will not intrude on the skyline.</li> <li>• Try and locate as many structures below the skyline.</li> </ul> </li> </ul> </li> </ul>



1	PLANNING AND DESIGN PHASE	
	ISSUE	MITIGATION MEASURES
		<ul style="list-style-type: none"> <li>• <b>Architectural guidelines must</b> be formulated as to blend buildings into the landscape through selection of specific materials and colours. Natural materials should be adopted if possible (e.g. stone, wood, etc.) and roof and wall colours must be natural (greens, browns and greys)</li> <li>• <b>Screening measures.</b> Appropriate indigenous tree species <b>must</b> be planted to create visual screen for dwellings and other structures.</li> <li>• <b>Articulated buildings</b> should preferably be used to create smaller scale structures, rather than large rectangular volumes, to accommodate the sloping terrain, and minimise visual impact.</li> <li>• <b>Building platforms</b> should avoid excessive cut and fill, or stilts on steep slopes, as they create visual eyesores. Narrow structures can more easily step down the slope. No structures should be permitted on slopes steeper than 1:4 gradient.</li> <li>• <b>Overhangs and verandahs</b> could be used to visually scale down the height of buildings. Large windows in particular should be shaded by roof overhangs or pergolas.</li> <li>• <b>Roof slopes</b> should follow the slope of the natural terrain, and have consistent angles within each group of dwellings, to avoid visually discordant roof forms.</li> <li>• <b>Sheltered internal courts</b> could be used for outdoor living. Meadows and forest should ideally come right up to the buildings.</li> <li>• <b>Fencing and walls</b> between houses or properties <b>must</b> be avoided as this will result in a suburban effect with major visual consequences. Planted hedges and tree clumps using indigenous species could be used instead to provide privacy and wind shelter.</li> <li>• <b>Clearing of indigenous vegetation must</b> be limited (or prohibited altogether) to the building footprint.</li> <li>• <b>Access roads</b> must be kept as narrow as feasible, in order to minimize visual impact, and to minimise grading and cut slopes on the hillsides. Adopt concretised tracks rather than complete road excavation.</li> <li>• <b>Road verges</b> could have grassed swales for stormwater runoff in order to retain the rural character of the area. Urban engineering details, such a concrete barrier kerbs and stormwater channels should be avoided.</li> <li>• <b>Roadway surfaces</b> for minor access roads and parking areas could include alternative materials, such as brick, gravel and reinforced grass.</li> <li>• <b>Hedgerows</b> should be planted along both sides of access roads to screen the residential developments, and to minimise the effect of headlights from cars at night.</li> <li>• <b>Large parking areas</b> must be avoided because of their visual impact.</li> <li>• <b>Lighting:</b> All exterior lighting must be shaded and directed downwards.</li> <li>• <b>Street lighting</b> should be avoided to retain the natural / rural character of the area. Low-level bollard lights could be used close to buildings, in parking areas and along paths. All lighting should be fitted with reflectors to avoid light spillage and minimise visual impact of lights at night.</li> <li>• <b>Signage</b> should generally be avoided on access routes and on buildings, to minimise visual clutter. No commercial signage should be permitted. Information signs should have a distinctive colour and standard symbols, similar to those used by SANParks. Signs should be located against a backdrop to avoid silhouette effects on the skyline. Low signs tend to be less obtrusive in the landscape.</li> <li>• <b>Utility lines</b> should be located underground to minimise visual intrusion in the exposed landscape. Utility structures, including power lines, pylons and masts should be carefully sited to avoid intrusion on the skyline.</li> </ul>



1 PLANNING AND DESIGN PHASE		
	ISSUE	MITIGATION MEASURES
		<ul style="list-style-type: none"> <li>• <b>Satellite dishes</b> and aerials must not protrude above the ridgeline of building roofs to minimise visual clutter in the landscape.</li> <li>• <b>Informal landscape</b> design should be used in preference to formal or geometric layouts.</li> <li>• <b>Formal gardens</b> or lawns should be avoided, and only locally occurring species should be used, given the context of the site adjacent to a national park.</li> <li>• <b>Landscaping guidelines</b> should be included in the Development Plan and Architectural Design Manual. A list of approved species should be included. Landscape plans are to be submitted with all building plans.</li> <li>• <b>Homeowners Association (HOA) Agreement:</b> The above mitigation measures must be included in the Homeowners Agreement and the controls provided must be complied with.</li> </ul>
1.12	Traffic	<ul style="list-style-type: none"> <li>• A Traffic Management Plan must be compiled during the planning and design phase detailing appropriate mitigation measures for construction related traffic impacts.</li> <li>• Appropriate signage and traffic calming measures must be implemented, to ensure road users are aware of the possibility of construction vehicles turning off/onto the Kei Mouth road.</li> </ul>
1.13	Heritage & Palaeontological Environment	<ul style="list-style-type: none"> <li>• Any comments and/or instructions received from the Eastern Cape Provincial Heritage Resources Authority (ECPHRA) and the South African Heritage Resource Agency (SAHRA) must be taken into consideration prior and during construction.</li> <li>• All necessary permits must be in place prior to the removal/destruction of any potential heritage or paleontological resources, if found on site during the site walkthrough by the ECO.</li> <li>• Prior to construction, the ECO and contractor must be made aware of potential new fossil findings. They must familiarise themselves with the sort of fossils they may be found in this area.</li> <li>• Should any graves be located prior to construction, the area must be demarcated and considered a No-Go area. The local heritage authority must be notified.</li> <li>• A full grave relocation process must be followed in accordance with the applicable regulations, should this be required.</li> </ul>

Table 5-2: Impacts and mitigation measures associated with the construction phase.

2. CONSTRUCTION PHASE		
	Issue	Mitigation
2.1	Relevant National Legislation and Policy	<ul style="list-style-type: none"> <li>• The developer must employ an independent Environmental Control Officer (ECO) for the construction phase to ensure that construction is implemented according to specifications in the EA and EMPr. Bi-weekly audits must be undertaken.</li> <li>• Copies of all applicable licenses, permits and managements plans (EA, EMPr, Water Use Licenses, Permits, etc.) must be available on-site at all times, and adhered to.</li> <li>• Environmental Awareness Training must be included in site meetings/talks with all workers, and all No-Go areas must be clearly communicated and demarcated.</li> </ul>



2.2	<b>Scheduling of construction</b>	<ul style="list-style-type: none"> <li>No construction must occur within 100m from the 1:100 year floodline of the Great Kei River.</li> <li>Wherever possible, construction activities should be undertaken during the driest part of the year to minimize downstream sedimentation due to excavation, etc.</li> <li>When not possible, sediment traps must be used to ensure the watercourses are not negatively impacted by construction activity.</li> </ul>
2.1	<b>Changes to fluvial geomorphology and hydrology</b>	<ul style="list-style-type: none"> <li>The construction within licensed watercourses should be done in a manner that is minimally invasive.</li> <li>Construction activities must adhere to the conditions of the Water Use License</li> <li>Roads which transverse watercourses must be installed with appropriately designed culvert structures.</li> <li>Sediment traps must be used to ensure the watercourses are not negatively impacted by construction activity.</li> </ul>
2.2	<b>Material Stockpiling</b>	<ul style="list-style-type: none"> <li>Topsoil which is excavated/removed during earthwork activities must be stockpiled on site for use during rehabilitation.</li> <li>No construction material is to be stored within 50 m of a watercourse or wetland system.</li> <li>Stockpiles must be monitored for erosion and mobilisation of materials towards watercourses.</li> <li>If this is noted by an ECO, suitable cut-off drains/berms/sediment traps must be placed between the stockpile area and the nearest watercourse.</li> </ul>
2.3	<b>Stormwater and Erosion Management</b>	<ul style="list-style-type: none"> <li>The conditions set out in the Storm Water Management Plan and Erosion Management Plan must be implemented and adhered to.</li> <li>The ECO must monitor for erosion and mobilization of sediment and recommend appropriate remedial action if required.</li> </ul>
2.4	<b>Waste Management</b>	<ul style="list-style-type: none"> <li>The conditions set out in the Waste Management Plan must be implemented and adhered to.</li> <li>Construction rubble must be disposed of in predetermined, demarcated spoil dumps.</li> <li>The ECO must monitor the Contractor campsite for litter and waste.</li> <li>All waste must be stored on site in closed bins and removed from the site and transported to the closest licensed landfill site.</li> </ul>
2.5	<b>Loss of Natural and Riparian Vegetation</b>	<ul style="list-style-type: none"> <li>All No-Go areas, such as riparian areas, 100m inland from the 1:100-year floodline of the Great Kei River and 50 m buffers applied to the iCwili River and smaller tributaries within the study area, must be avoided during construction.</li> <li>No development (other than authorised service infrastructure and the proposed dams) must occur within these no-go areas.</li> <li>Where unavoidable (i.e. service infrastructure, water-crossings), construction must be done in a manner that is minimally invasive, i.e. labour intensive rather than heavy machinery.</li> <li>The ECO must monitor construction activities undertaken within and near licensed water-crossings, and ensure that no unnecessary vegetation clearing takes place.</li> <li>Removal of the alien invasive vegetation must be prioritised.</li> <li>Vehicles and machinery must not encroach into areas outside the surveyed/demarcated development footprint.</li> <li>Areas within the construction footprint that have been cleared must be rehabilitated in terms of soil stabilisation and revegetation as soon as possible.</li> </ul>



2.6	<b>Loss of Species of Conservation Concern (SCC)</b>	<ul style="list-style-type: none"> <li>Should the ECO identify any SCC's within the development footprint, these must be demarcated and avoided until the necessary permits are in place and relocated outside of the footprint area by a suitably qualified individual/botanist.</li> <li>The contractor's staff must not poach or trap wild animals.</li> <li>The contractor's staff must not harvest any natural vegetation.</li> </ul>
2.7	<b>Inadequate protection of high conservation areas</b>	<ul style="list-style-type: none"> <li>The land-use management recommendations of the ECBCP and GKLM SDF must be applied as much as possible.</li> <li>No-Go areas, such as riparian zones, 100 m from the 1:100-year floodline of the Great Kei River and 50m from the smaller tributaries and intact thicket vegetation, must be kept free of direct and indirect impacts potentially resulting from the development.</li> </ul>
2.8	<b>Control alien invasive plant species</b>	<ul style="list-style-type: none"> <li>The conditions set out in the Alien Vegetation and Rehabilitation Plan must be implemented and adhered to.</li> <li>All temporarily cleared areas must be rehabilitated back to their original condition.</li> <li>Only topsoil from the immediate area must be used for rehabilitation.</li> </ul>
2.9	<b>Job creation</b>	<ul style="list-style-type: none"> <li>Where possible, individuals from the nearest local communities should be contracted for unskilled and semi-skilled employment.</li> </ul>
2.100	<b>Air pollution</b>	<ul style="list-style-type: none"> <li>Cleared surfaces must be dampened whenever possible, especially during dry and windy conditions, to avoid excessive dust generation.</li> <li>Any complaints or claims emanating from dust issues must be attended to immediately and noted in the complaints register.</li> </ul>
2.11	<b>Noise pollution</b>	<ul style="list-style-type: none"> <li>Construction activity close to residential settlements/BnBs, which includes the movement of construction vehicles, must be restricted to normal working hours (7:00am – 17:00pm).</li> <li>There must be a complaints register on site for nearby residents to make complaints, if required. These must be addressed and recorded.</li> </ul>
2.12	<b>Visual</b>	<ul style="list-style-type: none"> <li>Construction of the development must be done in accordance with the approved architectural design and aesthetics code.</li> <li>The site camp must be placed in an area that is not visually obtrusive to the neighbouring properties or local communities.</li> <li>The site camp and temporary structures must be decommissioned, and the area rehabilitated once construction has been completed.</li> <li>All waste, materials and equipment must be removed from site.</li> <li>The project area is to be kept tidy and free of litter, where possible.</li> </ul>
2.13	<b>Health and Safety</b>	<ul style="list-style-type: none"> <li>The contractor must ensure that operational firefighting equipment is present on site at all times as per Occupational Health and Safety Act.</li> <li>All construction foremen must be trained in fire hazard control and firefighting techniques.</li> <li>All flammable substances must be stored in dry areas which do not pose an ignition risk to the said substances.</li> <li>No open fires will be allowed on site unless in a demarcated area identified by the ECO.</li> <li>No smoking near flammable substances.</li> <li>All cooking must be done in demarcated areas considered safe in terms of runaway or uncontrolled fires.</li> <li>The contractor must ensure that workers adhere to all safety regulations as per Occupational Health and Safety Act.</li> <li>Appropriate PPE must be worn by workers at all time.</li> <li>Regular training/talks must be given to all workers on site regarding safe working procedures.</li> </ul>



		<ul style="list-style-type: none"> <li>• Appropriate warning signs must be in place to notify the public regarding construction activities and any areas of high risk, i.e. open excavations.</li> <li>• The construction site and camp must have access control and be demarcated, where possible.</li> <li>• Open excavations must be appropriately demarcated, where possible.</li> </ul>
2.14	<b>Management of hazardous substances</b>	<ul style="list-style-type: none"> <li>• Hazardous Chemical Substances Regulations promulgated in terms of the Occupational Health and Safety Act 85 of 1993 and the SABS Code of Practice must be adhered to. This applies to solvents and other chemicals possibly used during the construction process.</li> <li>• The individual(s) that will be handling hazardous materials must be trained to do so.</li> <li>• All hazardous chemicals must be stored properly in a secure, bunded and contained area.</li> <li>• Concrete must not be mixed directly on the ground, or during rainfall events when the potential for transport to the stormwater system is the greatest.</li> <li>• Concrete must only be mixed in the area demarcated for this purpose and on an impermeable surface, and not within 50m of any river/watercourse.</li> <li>• Oil trays must be placed under construction machinery to avoid soil contamination.</li> <li>• An oil absorbent materials/spill kit must be kept at the site camp in case of a spill.</li> <li>• Should a spill occur, the individual responsible for (or the individual who discovers the petrochemical spill) must report the incident to the Project Coordinator, ECO and/or Contractor as soon as reasonably possible. The immediate response must be to contain the spill.</li> <li>• The ECO must determine the precise method of treatment of polluted soil. This could involve the application of oil absorbent materials or oil-digestive</li> </ul>
2.15	<b>Sanitation and Water</b>	<ul style="list-style-type: none"> <li>• Adequate sanitary and ablutions facilities must be provided for construction workers.</li> <li>• No ablutions facilities are to be placed within 50m of a watercourse/tributary.</li> <li>• The facilities must be serviced regularly to reduce the risk of surface or groundwater pollution.</li> <li>• All wastewater from general activities in the camp must be collected and removed from the site for appropriate disposal at a licensed facility.</li> </ul>
2.16	<b>Traffic</b>	<ul style="list-style-type: none"> <li>• The conditions of the Traffic Management Plan must be implemented and adhered to.</li> <li>• Appropriate warning signs must be in place to notify the public regarding construction activities.</li> <li>• Construction vehicles are to adhere to traffic regulations.</li> <li>• Appropriate traffic safety measures, such as flagmen and speedbumps, must be used where deemed necessary.</li> </ul>
2.17	<b>Heritage &amp; Palaeontological Environment</b>	<ul style="list-style-type: none"> <li>• Should any human graves be discovered during construction, these areas must be demarcated and considered no-go areas.</li> <li>• Should the graves have been discovered during excavation works, the relevant heritage authority and specialist must be notified, and their recommendations adhered to.</li> <li>• Provisions must be made for a Fossil Chance Find Protocol to be implemented during the construction phase should fossils be encountered.</li> </ul>

Table 5-3: Impacts and mitigation measures associated with the operational phase.



3.	OPERATIONAL PHASE	
	Impact Description	Mitigation
3.1	<b>Stormwater and Erosion Management</b>	<ul style="list-style-type: none"> <li>• The conditions of the Storm Water Management Plan must be implemented and adhered to throughout the operational phase of the development.</li> <li>• Stormwater infrastructure must be monitored and maintained post construction to ensure that the receiving environment, particularly sensitive riparian areas are not negatively affected.</li> </ul>
3.2	<b>Waste Management</b>	<ul style="list-style-type: none"> <li>• The conditions of the Waste Management Plan must be implemented and adhered to throughout the operation of the development.</li> <li>• The Home Owners Association must ensure that waste is handled and disposed of in environmentally acceptable manners.</li> <li>• No waste must be disposed of on site.</li> <li>• Waste must be removed from site regularly and disposed of at the nearest licensed waste facility.</li> <li>• Where possible, provisions for waste recycling should be made available.</li> </ul>
3.3	<b>Sewage Package Plant Design &amp; Operation</b>	<ul style="list-style-type: none"> <li>• The Waste Management Plan must include: <ul style="list-style-type: none"> <li>○ A maintenance plan, undertaken by a suitably qualified individual, to ensure the treatment facility is running well.</li> <li>○ An appropriate water quality monitoring programme for the sewage package plant in accordance with the conditions of the water use license.</li> <li>○ Include regular monitoring and inspection of sanitation systems including: <ul style="list-style-type: none"> <li>▪ Fat traps</li> <li>▪ Evidence of system over flows</li> <li>▪ Inappropriate odours</li> <li>▪ Leaching around dispersal fields</li> </ul> </li> <li>○ Educational materials should be disseminated to households on how to properly maintain sanitation systems.</li> </ul> </li> </ul>
3.4	<b>Rehabilitation &amp; Maintenance</b>	<ul style="list-style-type: none"> <li>• The conditions of the Rehabilitation and Maintenance Plan must be implemented and adhered to throughout the operational phase of the project.</li> <li>• In particular, the sewage reticulation and associated infrastructure must undergo regular monitoring and serviced when required to minimize the risk of site contamination.</li> </ul>
3.5	<b>Inadequate protection of high conservation areas</b>	<ul style="list-style-type: none"> <li>• The land-use guidelines and principles of the ECBCP and GKLM SDF must be included in the Home Owners Agreement.</li> <li>• All applicable management plans must be implemented and included in Home Owners Agreement, ie.: <ul style="list-style-type: none"> <li>○ Operational Environmental Management Programme (EMPr)</li> <li>○ Stormwater Management Plan;</li> <li>○ Erosion Management Plan;</li> <li>○ Waste management Plan;</li> <li>○ Traffic Management Plan;</li> <li>○ Conservation Management Plan;</li> <li>○ Environmental Monitoring Programme (water quality);</li> <li>○ Alien Species Management Plan; and</li> <li>○ Rehabilitation and Maintenance Plan</li> </ul> </li> </ul>



3.	OPERATIONAL PHASE	
	Impact Description	Mitigation
3.6	<b>Control of alien invasive plant species</b>	<ul style="list-style-type: none"> <li>The Alien Vegetation Management Plan must be included as part of the developments on-going maintenance plan to reduce the establishment and spread of undesirable alien plant species throughout the operational phase.</li> <li>Indigenous species must be prioritized for use within the estate</li> </ul>
3.7	<b>Job creation</b>	<ul style="list-style-type: none"> <li>Where possible, individuals from the nearest local communities should be contracted for unskilled and semi-skilled employment.</li> </ul>
3.8	<b>Management of hazardous substances</b>	<ul style="list-style-type: none"> <li>Hazardous Chemical Substances Regulations promulgated in terms of the Occupational Health and Safety Act 85 of 1993 and the SABS Code of Practice must be adhered to. This applies to solvents and other chemicals possibly used during the operation of the development.</li> <li>All hazardous chemicals must be stored properly in a secure, bunded and contained area.</li> <li>The Home Owners Association must have appropriate emergency response procedures in place to deal with possible spills.</li> <li>The Home Owners Agreement must clearly detail all activities/hazardous substances which area prohibited.</li> </ul>
3.9	<b>Traffic</b>	<ul style="list-style-type: none"> <li>The Home Owners Association should ensure all occupants are considerate of neighbouring properties when using the local access roads.</li> <li>Provisions for a grievance procedure should be incorporated into the Home Owners Agreement.</li> <li>Road infrastructure must be maintained, when required.</li> </ul>
3.10	<b>Tourism</b>	<ul style="list-style-type: none"> <li>No mitigation proposed</li> </ul>



## 6 ENVIRONMENTAL MONITORING

According to APPENDIX 4 of GN R 326, an environmental management programme must include:

- (g) The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);
- (h) The frequency of monitoring the implementation of the impact management actions contemplated in (f);

A monitoring programme must be implemented for the duration of the construction and operation of the Kei Mouth Eco Estate. This programme should include:

- Establishing a baseline of pre-construction site conditions validated with photographic evidence.
- Monthly audits will be conducted by an independent ECO for the construction phase to ensure compliance with the conditions stipulated in this EMPr and, where necessary, make recommendations for corrective action. These audits can be conducted randomly and do not require prior arrangement with the Project Coordinator.
- Compilation of an audit report with a rating of compliance with the EMPr. The ECO must keep a photographic record of the demarcated site and construction area. The Contractor must be held liable for all unnecessary damage to the environment. A register must be kept of all complaints from the community. All complaints / claims must be handled immediately to ensure timeous rectification / payment by the responsible party.



## 7 ROLES AND RESPONSIBILITIES

**According to APPENDIX 4 of GN R 326, an environmental management programme must include:**

- (i) An indication of the persons who will be responsible for the implementation of the impact management actions;

### 7.1 PROJECT COORDINATOR

The Project Coordinator is responsible for overall management of the project and the implementation of the EMPr. The following tasks fall within his / her responsibilities:

- Be familiar with the recommendations and mitigation measures of this EMPr, and implement these measures;
- Monitor site activities on a daily basis for compliance;
- Conduct internal audits of the construction site against the EMPr;
- Confine the construction site to the demarcated areas; and
- Rectify transgressions through the implementation of corrective action.

### 7.2 CONTRACTOR

The Contractor is responsible for the overall execution of the activities envisioned in the construction phase, including the implementation and compliance with recommendations and conditions of the EMPr. The Contractor must therefore ensure compliance with the EMPr at all times during construction activities and maintain an environmental register which keeps a record of all environmental incidents that occur on the site during construction and rehabilitation of the R56. These incidents may include:

- Public involvement / complaints;
- Health and safety incidents;
- Incidents involving Hazardous materials stored on site; and
- Non-compliance incidents.

The Contractor is also responsible for the implementation of corrective actions issued by the ECO and Project Coordinator within a reasonable or agreed upon period of time.

### 7.3 ENVIRONMENTAL CONTROL OFFICER

For the purposes of implementing the conditions contained herein, the Developer must appoint an ECO for the contract. The ECO must be the responsible person for ensuring that the provisions of the EMPr and that



any necessary environmental authorisations are complied with during the construction period. The ECO's duties in this regard will include, *but are not limited to*, the following:

- Conduct regular site visits to be able to report on and respond to any environmental issues;
- Report compliance and non-compliance issues to the competent authority;
- Advise the Contractor on environmental issues within the defined work areas;
- Review access and incident records that may pertain to the environment and reconcile the entries with the observations made during site inspection, monitoring and auditing;
- Recommend corrective action when required for aspects of non-compliance within the EMPr;
- Take immediate action on site where clearly defined and agreed upon "no-go" areas are violated or in danger of being violated, inform the Developer of the occurrence immediately and take action; and
- Be contactable by the public regarding matters of environmental concern as they relate to the operation of the works.



## 8 COMPLIANCE WITH THE EMPr

According to APPENDIX 4 of GN R 326, an environmental management programme must include:

- (j) The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;
- (k) The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);

A copy of the EMPr must be kept on site at all times during the construction period. The EMPr will be binding on all contractors operating on the site and must be included within the Contractual Clauses.

It should be noted that in terms of Section 28 of the National Environmental Management Act (No. 107 of 1998): those responsible for environmental damage must pay the repair costs both to the environment, human health and the preventative measures to reduce or prevent further pollution and/or environmental damage (The 'polluter pays' principle).

### 8.1 NON-COMPLIANCE

The contractors must act immediately when notice of non-compliance is received and take corrective action. Complaints received regarding activities on the construction site pertaining to the environment must be recorded in a dedicated register and the response(s) noted with the date and action taken. The ECO should be made aware of any complaints.

Any non-compliance with the agreed procedures of the EMPr is a transgression of the various statutes and laws that define the manner by which the environment is managed. Failure to redress the cause must be reported to the competent authority for them to deal with the transgression, as it deems fit.

The Contractor is deemed not to have complied with the EMPr if, *inter alia*:

- There is evidence of contravention of the EMPr specifications within the boundaries of the construction site and site extensions;
- There is contravention of the EMPr specifications which relate to activities outside the boundaries of the construction site;
- Environmental damage ensues due to negligence;
- Construction activities take place outside the defined boundaries of the site; and/or
- The Contractor fails to comply with corrective or other instructions issued within a specific time period.



It is recommended that the Contractors institute penalties for the following less serious violations and any others determined during the course of work, as detailed below:

- Littering on site.
- Lighting of illegal fires on site.
- Persistent or unrepaired fuel and oil leaks.
- Any persons, vehicles or equipment related to the Contractor's operations found within the designated "no-go" areas.
- Excess dust or excess noise emanating from site.
- Possession or use of intoxicating substances on site.
- Any vehicles being driven in excess of designated speed limits.
- Removal and/or damage to fauna, flora, cultural or heritage objects on site.
- Urination and defecation anywhere except at designated facilities.

## 8.2 EMERGENCY PREPAREDNESS

The Contractor must compile and maintain environmental emergency procedures to ensure that there will be appropriate responses to unexpected or accidental actions or incidents that will cause environmental impacts, throughout the construction period. Such activities may include, *inter alia*:

- Accidental waste water discharges to water and land.
- Accidental fires.
- Accidental spillage of hazardous substances.
- Specific environmental and ecosystem effects from accidental releases or incidents.

These plans should include:

- Emergency organisation (manpower) and responsibilities, accountability and liability.
- A list of key personnel and contact details.
- Details of emergency services available (e.g. the fire department, spill clean-up services, etc.).
- Internal and external communication plans, including prescribed reporting procedures where required by legislation.
- Actions to be taken in the event of different types of emergencies.
- Incident recording, progress reporting and remediation measures required to be implemented.
- Information on hazardous materials, including the potential impact associated with each, and measures to be taken in the event of accidental release.
- Training plans, testing exercises and schedules for effectiveness.

The Contractor must comply with the emergency preparedness and incident- and accident-reporting requirements, as required by the Occupational Health and Safety Act (No. 85 of 1993), the NEMA (No. 107 of 1998) and the National Water Act (No. 36 of 1998) as amended and/or any other relevant legislation.



## 8.3 INCIDENT REPORTING AND REMEDY

If a leakage or spillage of hazardous substances occurs on site, the local emergency services must be immediately notified of the incident. The following information must be provided:

- the location;
- the nature of the load;
- the extent of the impact; and
- the status at the site of the accident itself (i.e. whether further leakage is still taking place, whether the vehicle or the load is on fire).

Written records must be kept on the corrective and remedial measures decided upon and the progress achieved therewith over time. Such progress reporting is important for monitoring and auditing purposes. The written reports may be used for training purposes in an effort to prevent similar future occurrences.

## 8.4 PENALTIES

Where environmental damage is caused or a pollution incident, and/or failure to comply with any of the environmental specifications contained in the EMPr, the Developer and/or the Contractor will be liable.

The following violations, and any others determined during the course of work, should be penalised:

- Hazardous chemical/oil spill and/or dumping in non-approved sites.
- Damage to sensitive environments.
- Damage to cultural and historical sites.
- Unauthorised removal/damage to indigenous trees and other vegetation, particularly in identified sensitive areas.
- Uncontrolled/unmanaged erosion.
- Unauthorised blasting activities (*if applicable*).
- Pollution of water sources.
- Unnecessary removal or damage to trees.

The following steps will be followed by the ECO, on behalf of the Developer, when observing a transgression:

- 1 **Transgression observed:** Give a warning to the Contractor, with time to remedy the situation. Report transgression and agreed remedial action to the Developer.
- 2 **Transgression not remedied:** Report the Contractor directly to the Developer and issue a financial penalty to the Contractor with an agreed time period to remedy the situation with the assistance of the Developer (*if necessary*).
- 3 **Failure to remediate:** Depending on the severity and impact significance of the transgression, which must be assessed and discussed with the Developer prior to reporting to the competent authority, the ECO may report directly to DEA (Compliance) recommending that for:



- HIGH impact: DEA to issue a notice to cease construction;
- MEDIUM impact: DEA to issue a notice instructing the Developer to implement recommended remedial action; and/or
- LOW impact: ECO to notify, but up to discretion of DEA to apply sanction.

In all cases, however, non-compliance must be reported to DEA in the monthly audit reports. However, the ECO will also report on corrective actions proposed and implemented.

The following schedule of fines for environmental damage or EMPr transgressions have been adapted from the City of Cape Town: Standard Environmental Specifications.

**Table 8-1: List of fines for transgressions or resultant environmental damage**

<b>TRANSGRESSION OR RESULTANT ENVIRONMENTAL DAMAGE</b>	<b>Min. fine</b>	<b>Max. fine</b>
Failure to comply with prescriptions regarding ECO appointment and monitoring of EMPr	R1 000	R2 000
Failure to comply with prescriptions regarding environmental awareness training	R2000	R10 000
Failure to comply with prescriptions regarding method statements	R2 000	R10 000
Failure to report environmental damage or EMPr transgressions to the ECO	R1 000	R2 000
Failure to carry out instructions of the DEO/ECO regarding the environment of the EMPr	R1 000	R2 000
Failure to comply with prescriptions posting of emergency numbers	R2 000	R10 000
Failure to comply with prescriptions regarding information boards	R1 000	R2 000
Failure to comply with prescriptions regarding a complaints register	R1 000	R2 000
Failure to comply with prescriptions regarding site demarcation and enforcement of "no go" areas	R2 000	R10 000
Failure to comply with prescriptions regarding site clearing	R2 000	R10 000
Failure to comply with prescriptions for the storage of imported materials within a designated Contractors yard	R1 000	R2 000
Failure to comply with prescribed administration, storage or handling of hazardous substances	R1 000	R2 000
Failure to comply with prescriptions regarding equipment maintenance and storage	R1 000	R2 000
Failure to comply with fuel storage, refuelling, or clean-up prescriptions	R1 000	R2 000
Failure to comply with prescriptions regarding procedures for emergencies (spillages and fires)	R2 000	R10 000
Failure to comply with prescriptions regarding construction camp	R2 000	R10 000



Failure to comply with prescriptions for the use of ablution facilities	R1 000	R2 000
Failure to comply with prescriptions regarding water provision	R1 000	R2 000
Failure to comply with prescriptions for the use of designated eating areas, heating source for cooking or presence of fire extinguishers	R1 000	R2 000
Failure to comply with prescriptions regarding fire control	R2 000	R10 000
Failure to comply with prescriptions for solid waste management	R2 000	R10 000
Failure to comply with prescriptions to prevent water pollution and sedimentation	R2 000	R10 000
Failure to comply with prescriptions to the protection of natural features, flora, fauna and archaeology	R2 000	R10 000
Failure to comply with prescriptions regarding speed limits	R1 000	R2 000
Failure to comply with prescriptions regarding noise levels of construction activity	R2 000	R10 000
Failure to comply with prescriptions regarding working hours	R2 000	R10 000
Failure to comply with prescriptions regarding aesthetics	R1 000	R2 000
Failure to comply with prescriptions regarding dust control	R1 000	R2 000
Failure to comply with prescriptions regarding security and access onto private property	R1 000	R2 000
Failure to comply with prescriptions regarding cement and concrete batching	R2 000	R10 000



## 9 REPORTING

**According to APPENDIX 4 of GN R 326, an environmental management programme must include:**

- (l) A program for reporting on compliance, taking into account the requirement as prescribed by the regulations.

### 9.1 ADMINISTRATION

Before the construction activities commence, the Contractor must provide the ECO and the Developer with a written method statement setting out the following:

- Details of the construction activities;
- Location where the activity will take place;
- Identification of impacts that might result from the activity;
- Identification of activities that may cause impacts;
- Methodology and/or specifications for impact prevention for each activity or aspect;
- Methodology and/or specifications for impact containment for each activity or aspect;
- Emergency/disaster incident and reaction procedures; and the
- Treatment and continued maintenance of the impacted environment.

The Contractor should provide such information in advance of any or all construction activities provided that new submissions are given to the ECO whenever there is a change or variation to the original.

The ECO should provide comment on the methodology and procedures proposed by the Contractor but he/she will not be responsible for the Contractor's chosen measures of impact mitigation and emergency/disaster management systems.

### 9.2 GOOD HOUSEKEEPING

The Contractor must undertake "good housekeeping" practices during construction. This will help avoid disputes on responsibility and allow for the smooth running of the contract as a whole. Good housekeeping extends beyond the wise practice of construction methods to include the care for and preservation of the environment within which the construction is situated.

### 9.3 RECORD KEEPING

The ECO must continuously monitor the Contractor's adherence to the approved impact prevention procedures and the ECO must issue the Contractor with a notice of non-compliance whenever transgressions are observed. The ECO should document the nature and magnitude of the non-compliance in a designated



register, the action taken to discontinue the non-compliance, the action taken to mitigate its effects and the results of the actions. The non-compliance should be documented and reported to the Developer in the monthly report. These reports must be made available to DEA when requested.

## 9.4 DOCUMENT CONTROL

The Contractor is responsible for establishing a procedure for electronic document control. The document control procedure should comply with the following requirements:

- Documents must be identifiable by organisation, division, function, activity and contact person.
- Every document should identify the personnel and their position(s), who drafted and compiled the document(s), who reviewed and recommended approval, and who finally approved the document for distribution.
- All documents should be dated, provided with a revision number and reference number, filed systematically, and retained for a five year period.

The Contractor must ensure that documents are periodically reviewed and revised, *where necessary*, and that current versions are available at all locations where operations essential to the functioning of the EMPR are performed. All documents must be made available to the ECO and other independent external auditors.



## 10 ENVIRONMENTAL AWARENESS

**According to APPENDIX 4 of GN R 326, an environmental management programme must include:**

- (m) An environmental awareness plan describing the manner in which –
  - (i) The applicant intends to inform his or her employees of any environmental risk which may result from their work; and
  - (ii) Risks must be dealt with in order to avoid pollution or the degradation of the environment.

The Contractors must ensure that their employees and any third party, who carries out all or part of the Contractors' obligations, are adequately trained with regard to the implementation of the EMPr and the general environmental legal requirements and obligations. Training should be conducted by the ECO where necessary.

Environment and health awareness training programmes should be targeted at three distinct levels of employment, i.e. the executive, middle management and labour. Environmental awareness training programmes should contain the following information:

- The names, positions and responsibilities of personnel to be trained;
- The framework for appropriate training plans;
- The summarised content of each training course; and
- A schedule for the presentation of the training courses.

The ECO must ensure that records of all training interventions are kept in accordance with the record keeping and documentation control requirements as set out in this EMPr. The training records must verify each of the targeted personnel's training experience.

The Developer must ensure that adequate environmental training takes place. All employees must be given an induction presentation on environmental awareness and the content of the EMPr. The presentation needs to be conducted in the language of the employees to ensure it is understood. The environmental training must, as a minimum, include the following:

- The importance of conformance with all environmental policies;
- The environmental impacts, actual or potential, of their work activities;
- The environmental benefits of improved personal performance;
- Their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirement of the Agency's environmental management systems, including emergency preparedness and response requirements;
- The potential consequences of departure from specified operating procedures;



- The mitigation measures required to be implemented when carrying out their work activities;
- Environmental legal requirements and obligations;
- Details regarding floral/faunal species of special concern and protected species, and the procedures to be followed should these be encountered during the construction of approach roads or construction camps;
- The importance of not littering;
- The importance of using supplied ablution facilities;
- The need to use water sparingly;
- Details of and encouragement to minimise the production of waste and re-use, recover and recycle waste where possible; and the
- Details regarding archaeological and/or historical sites which may be unearthed during construction and the procedures to be followed should these be encountered.

***Recommended Environmental Education Material is provided in Appendix A.***

## 10.1 MONITORING OF ENVIRONMENTAL TRAINING

The Contractor must monitor the performance of construction workers to ensure that the points relayed during their introduction have been properly understood and are being followed. If necessary, the ECO and / or a translator should be called to the site to further explain aspects of environmental or social behaviour that are unclear. Toolbox talks are recommended



# 11 CLOSURE PLANNING

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Final site cleaning - the contractor must clear and clean the site and ensure that all equipment and residual materials not forming part of the permanent works is removed from site before issuing the completion certificate or as otherwise agreed.

Rehabilitation - the contractor (landscape architect/horticulturist) must be responsible for rehabilitating and re-vegetation of all areas disturbed/areas earmarked for conservation during construction to the satisfaction of the engineer and ECO.

## 11.1 POST-CONSTRUCTION AUDIT

A post-construction audit must be carried out and submitted to DEA at the expense of the Developer. Objectives should be to audit compliances with the key components of the EMPr, to identify main areas requiring attention and recommend priority actions. The audit should be undertaken annually and should cover a cross section of issues, including implementation of environmental controls, environmental management and environmental monitoring.

Results of the audits should inform changes required to the specifications of the EMPr or additional specifications to deal with any environmental issues which arise on site and have not been dealt with in the current document.

## 11.2 GENERAL REVIEW OF EMPR

The EMPr will be reviewed by the ECO on an on-going basis. Based on observations during site inspections and issues raised at site meetings, the ECO will determine whether any procedures require modification to improve the efficiency and applicability of the EMPr on site.

Any such changes or updates will be registered in the ECO's record, as well as being included as an annexure to this document. Annexures of this nature must be distributed to all relevant parties.



## 12 CONCLUSIONS

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All foreseeable actions and potential mitigations and/or management actions are contained in this document; the EMPr should be seen as a day-to-day management document. The EMPr thus sets out the environmental and social standards, which would be required to minimise the negative impacts and maximise the positive benefits of the construction activities. The EMPr could thus change daily, and if managed correctly lead to a successful construction and operation phases.

All attempts should be made to have this EMPr available, as part of any tender documentation, so that the Contractors are made aware of the potential cost and timing implications needed to fulfil the implementation of the EMPr, thus adequately costing for these.



## 13 APPENDIX A

### PROPOSED ENVIRONMENTAL EDUCATION COURSE

# WHAT IS THE ENVIRONMENT?

- Soil
- Water
- Plants
- People
- Animals
- Air we breathe
- Buildings, cars and houses



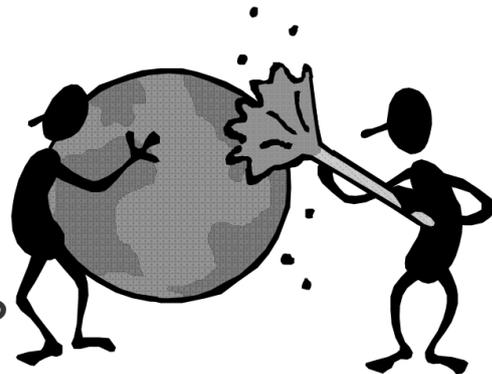


# WHY MUST WE LOOK AFTER THE ENVIRONMENT?

- It affects us all as well as future generations
- We have a right to a healthy environment
- A contract has been signed
- Disciplinary action (e.g. construction could stop or fines issued)

# HOW DO WE LOOK AFTER THE ENVIRONMENT?

- Report problems to your supervisor/ foreman
- Team work
- Follow the rules in the EMP





## WORKING AREAS

Workers & equipment must stay inside the site boundaries at all times



## RIVERS & STREAMS

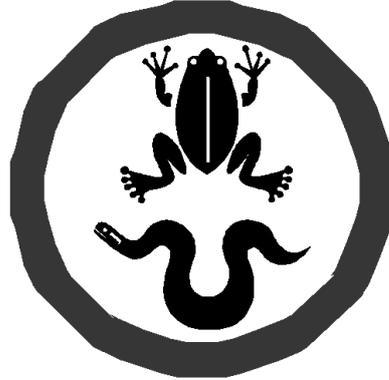
- Do not swim in or drink from streams
- Do not throw oil, petrol, diesel, concrete or rubbish in the stream
- Do not work in the stream without direct instruction
- Do not damage the banks or vegetation of the stream





## ANIMALS

- Do not injure or kill any animals on the site
- Ask your supervisor or Contract's Manager to remove animals found on site



## TREES AND FLOWERS

- Do not damage or cut down any trees or plants without permission
- Do not pick flowers





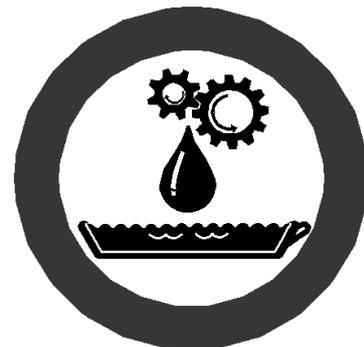
## SMOKING AND FIRE

- Put cigarette butts in a rubbish bin
- Do not smoke near gas, paints or petrol
- Do not light any fires without permission
- Know the positions of fire fighting equipment
- Report all fires
- Do not burn rubbish or vegetation without permission



## PETROL, OIL AND DIESEL

- Work with petrol, oil & diesel in marked areas
- Report any petrol, oil & diesel leaks or spills to your supervisor
- Use a drip tray under vehicles & machinery
- Empty drip trays after rain & throw away where instructed





# DUST

Try to avoid producing dust -  
Use water to make ground &  
soil wet



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# NOISE

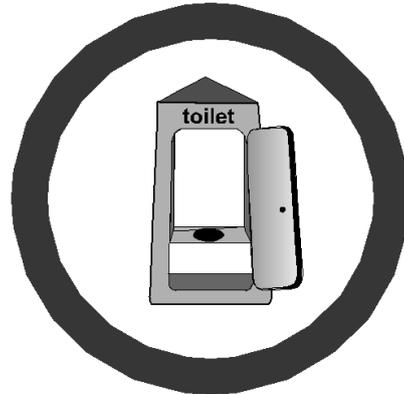
- Do not make loud noises around the site, especially near schools and homes
- Report or repair noisy vehicles





# TOILETS

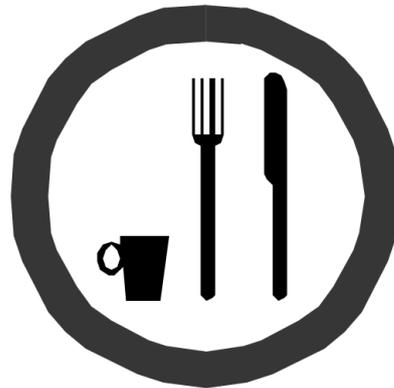
- Use the toilets provided
- Report full or leaking toilets



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# EATING

- Only eat in demarcated eating areas
- Never eat near a river or stream
- Put packaging & leftover food into rubbish bins





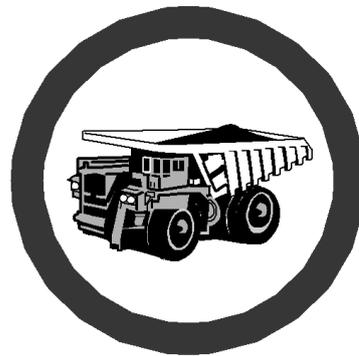
## RUBBISH

- Do not litter - put all rubbish (especially cement bags) into the bins provided
- Report full bins to your supervisor
- The responsible person should empty bins regularly



## TRUCKS AND DRIVING

- Always keep to the speed limit
- Drivers - check & report leaks and vehicles that belch smoke
- Ensure loads are secure & do not spill





# EMERGENCY PHONE NUMBERS

Know all the emergency phone numbers:

- Local Municipality:
- Ambulance:
- Fire:
- Police:

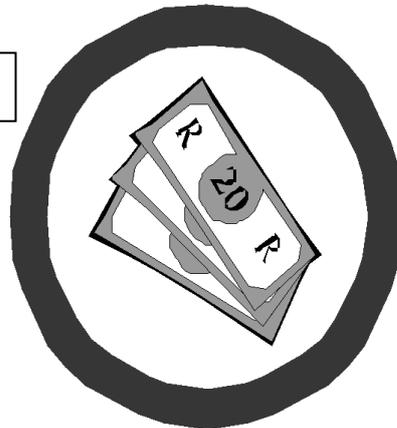


# FINES AND PENALTIES

- Spot fines of between

*To be confirmed by the Engineer*

- Your company may be fined
- Removal from site
- Construction may be stopped





# PROBLEMS - WHAT TO DO!

- Report any breaks, floods, fires, leaks and injuries to your supervisor
- Ask questions!





# APPENDIX B

## ENVIRONMENTAL AUTHORISATION



# APPENDIX C

## PRO-FORMA: PROTECTION OF THE ENVIRONMENT

Employer \_\_\_\_\_  
 Contract No \_\_\_\_\_  
 Contract title \_\_\_\_\_

The Contractor will not be given right of access to the site until this form has been signed.

I/ we \_\_\_\_\_ (Contractor) record as follows:

1. I/ we, the undersigned, do hereby declare that I/ we am/ are aware of the increasing requirement by society that construction activities must be carried out with due regard to their impact on the environment.

2. In view of this requirement of society and a corresponding requirement by the Employer with regard to this Contract, I/ we will, in addition to complying with the letter of the terms of the Contract dealing with protection of the environment, also take into consideration the spirit of such requirements and will, in selecting appropriate employees, plant, materials and methods of construction, in so far as I/ we have the choice, include in the analysis not only the technical and economic (both financial and with regard to time) aspects but also the impact on the environment of the options. In this regard, I/ we recognise and accept the need to abide by the "precautionary principle" which aims to ensure the protection of the environment by the adoption of the most environmentally sensitive construction approach in the face of uncertainty with regard to the environmental implications of construction.

3. I/ we acknowledge and accept the right of \_\_\_\_\_ to deduct, should they so wish, from any amounts due to me/us, such amounts (hereinafter referred to as fines) as the Resident Engineer and Environmental Site Officer must certify as being warranted in view of my/ our failure to comply with the terms of the Contract dealing with protection of the environment, subject to the following:

3.1 The Resident Engineer and Environmental Officer, in determining the amount of such fine, must take into account *inter alia*, the nature of the offence, the seriousness of its impact on the environment, the degree of prior compliance/non-compliance, the extent of the Contractor's overall compliance with environmental protection requirements and, in particular, the extent to which he considers it necessary to impose a sanction in order to eliminate/reduce future occurrences.

3.2 The Resident Engineer and Environmental Officer must, with respect to any fine imposed, provide me/ us with a written statement giving details of the offence, the facts on which the Resident Engineer and Environmental Officer has based his assessment and the terms of the Contract (by reference to the specific clause) which has been contravened.

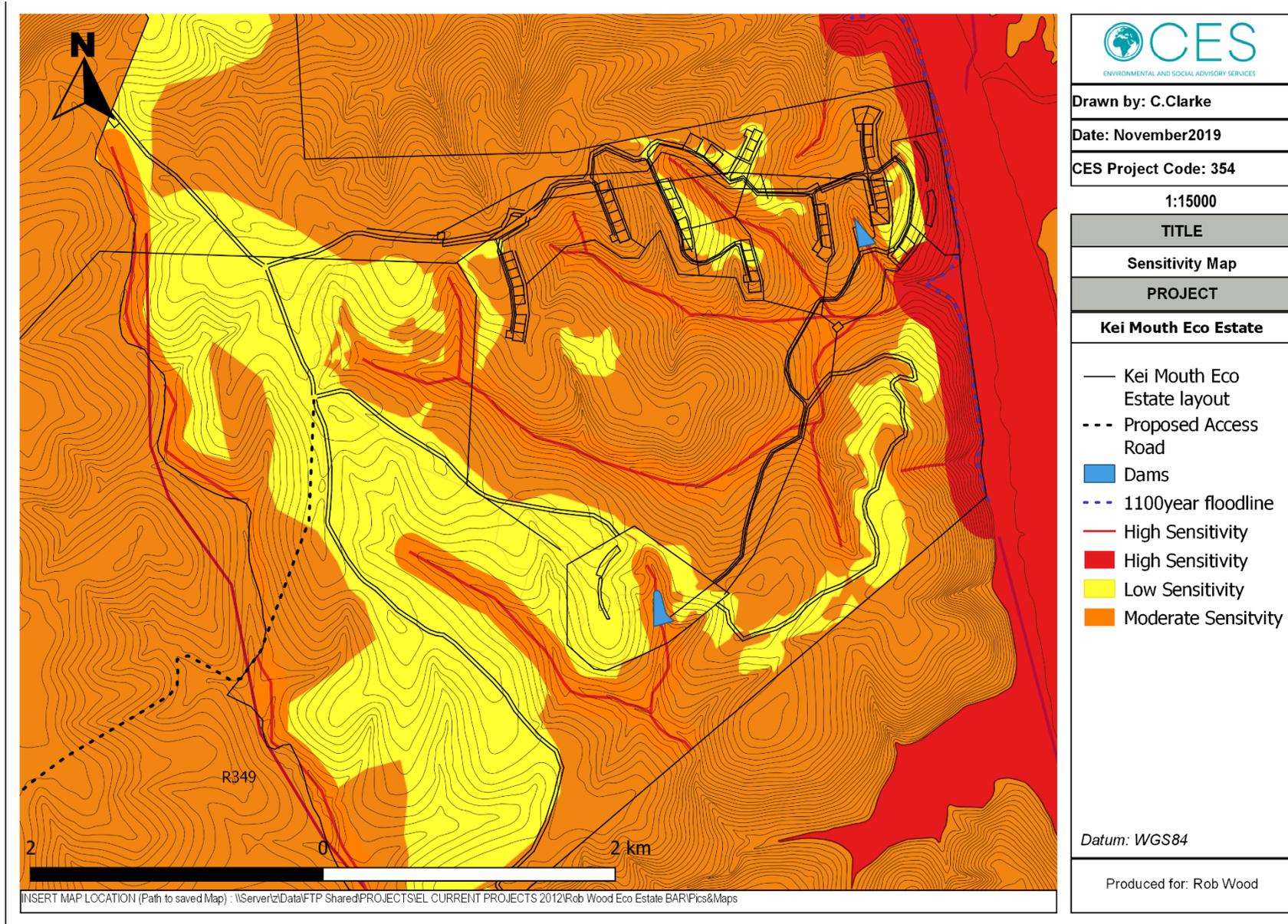
Signed \_\_\_\_\_  
CONTRACTOR

Date \_\_\_\_\_



## APPENDIX D: SENSITIVITY MAP

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## APPENDIX E: C.V's

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## CONTACT DETAILS

<b>Name of Company</b>	<b>CES – Environmental and Social Advisory Services</b>
<b>Designation</b>	East London Branch
<b>Profession</b>	Executive
<b>Years with firm</b>	17 (Seventeen) Years
<b>E-mail</b>	a.carter@cesnet.co.za
<b>Office number</b>	+27 (0)43 7267809 / 8313
<b>Nationality</b>	South African
<b>Professional Body</b>	SACNASP: South African Council for Natural Scientific Profession EAPSA: Environmental Assessment Practitioners Southern Africa IWMSA: Institute Waste Management Southern Africa TSBPA: Texas State Board of Public Accountancy (USA)
<b>Key areas of expertise</b>	<ul style="list-style-type: none"><li>➤ Marine Ecology</li><li>➤ Environmental and coastal management</li><li>➤ Waste management</li><li>➤ Financial accounting and project feasibility studies</li><li>➤ Environmental management systems, auditing and due-diligence</li></ul>

## PROFILE

Alan has extensive training and experience in both financial accounting and environmental science disciplines with international accounting firms in South Africa and the USA. He is a member of the American Institute of Certified Public Accountants (licensed in Texas) and holds a PhD in Plant Sciences. He is also a certified ISO14001 EMS auditor with the American National Standards Institute. Alan has been responsible for leading and managing numerous and varied consulting projects over the past 25 years.

**EMPLOYMENT  
EXPERIENCE**

- October 2013 – Present: Executive (EOH Coastal & Environmental Services, East London, South Africa)
- January 2002 – September 2013: Director (Coastal & Environmental Services, East London, South Africa)
- January 1999 – December 2001: Manager (Arthur Andersen LLP, Public Accounting Firm, Chicago, Illinois USA)
- December 1996 – December 1998: Senior Accountant/Auditor (Ernst & Young LLP, Public Accounting Firm, Austin, Texas, USA.)
- January 1994 – December 1996: Senior Accountant/Auditor (Ernst & Young, Charteris & Barnes, Chartered Accountants, East London, South Africa)
- July 1991 – December 1994: Associate Consultant (Coastal & Environmental Services, East London, South Africa)
- March 1989 – June 1990: Data Investigator (London Stock Exchange, London, England, United Kingdom)

**ACADEMIC  
QUALIFICATIONS**

- Ph.D. Plant Science (Marine) Rhodes University 1987
- B. Compt. Hons. Accounting Science University of South Africa 1997
- B. Com. Financial Accounting Rhodes University 1995
- B.Sc. Hons. Plant Science Rhodes University 1983
- B.Sc. Plant Science & Zoology Rhodes University 1982

**COURSES**

- *Environmental Management Systems Lead Auditor Training Course - American National Standards Institute and British Standards Institute (2000)*
- *ISO 14001:2015 Implementing Changes - British Standards Institute (2015)*
- *Numerous other workshops and training courses*

**CONSULTING  
EXPERIENCE**

**Environmental Impact Assessment, Feasibility and Pre-feasibility Assessments**

- Managed numerous projects and prepared environmental impact assessment (EIA) reports in terms of relevant EIA legislation and regulations for development proposals including: Infrastructure projects: bulk water and waste water, roads, electrical, mining, ports, aquaculture, renewable energy (solar and wind), industrial processes, housing developments, golf estates and resorts, etc. (2002 – present).
- Projects have also included preparation of applications in terms of other statutory requirements, such as water-use and mining licence /permit applications.
- Managed projects to develop pre-feasibility and feasibility assessments for various projects, including various tourism developments, infrastructure projects, etc.
- Managed project for the East London Industrial Development Zone (ELIDZ) to develop a Conceptual Framework for a Mariculture Zone within the ELIDZ (2009).
- Managed pre-feasibility study to establish a Mariculture Zone within the Coega Industrial Development Zone (2014).
- Assisted City of Johannesburg in the process to proclaim four nature reserves in terms of relevant legislation (2015-2016).

- Acted as Environmental Control Officer (ECO) for numerous projects including solar and wind farms, roads, industrial processes, etc.

**Strategic Environmental Assessment**

- Managed Strategic Environmental Assessment (SEA) project toward the development of a Biofuel Industry in the Eastern Cape Province of South Africa (2014-2016)
- Managed Strategic Environmental Assessment (SEA) projects for two South African ports (2006 – 2007).
- Managed Strategic Environmental Assessment (SEA) projects for five (5) local municipalities in the Eastern Cape as part of the municipal Spatial Development Framework plans (2004 – 2005).
- Involved in the financial assessment of various land-use options and carbon credit potential as part of a larger Strategic Environmental Assessment (SEA) for assessing forestry potential in Water Catchment Area 12 in the Eastern Cape of South Africa (2006).

**Climate change, emissions trading and renewable energy**

- Provided specialist peer review services for National Department of Environmental Affairs relating to climate change impact assessments for large infrastructure projects (2017-2018).
- Conducted climate change impact assessment for a proposed coal-fired power station in Africa (2017-2018).
- Participated in the development of a web-based Monitoring & Evaluation (M&E) system for climate change Mitigation and Adaptation in South Africa for National Department of Environmental Affairs (DEA) (2015-2016).
- Managed project to develop a Climate Change Strategy for Buffalo City Metro Municipality (2013).
- Managed projects to develop climate change strategies for two district municipalities in the Eastern Cape Province (2011).
- Conducted specialist carbon stock and greenhouse gas emissions impact and life cycle assessment as part of the Environmental, Social and Health Impact Assessment for a proposed sugarcane to ethanol project in Sierra Leone (2009 - 2010) and a proposed Jatropha bio-diesel project in Mozambique (2009 - 2010).
- Managed project to develop the Eastern Cape Province Climate Change Strategy (2010).
- Managed project to develop a Transnet National Ports Authority Climate Change Risk Strategy (2009)
- Participated in a project to develop a Renewable Energy roadmap for the East London Industrial Development Zone (ELIDZ) (2013).
- Participated in a project for the East London Industrial Development Zone (ELIDZ) and Eastern Cape Government to prepare a Renewable Energy Strategy (2009).
- Contributed to the development of Arthur Andersen LLP's International Climate Change and Emissions Trading Services (2001).
- Conducted carbon credit (Clean Development Mechanism - CDM) feasibility assessment for a variety of renewable energy projects ranging from biogas to solar PV.
- Participated in the preparation of CDM applications for two solar PV projects

in the Eastern Cape.

**Waste Management**

- Managed project to develop Integrated Waste Management Plans for six local municipalities on behalf of the Sarah Baartman District Municipality in the Eastern Cape Province (2016).
- Managed project to develop Integrated Waste Management Plans for four local municipalities on behalf of Alfred Nzo District Municipality in the Eastern Cape Province (2015).
- Managed project to develop Integrated Waste Management Plans for eight local municipalities on behalf of Chris Hani District Municipality in the Eastern Cape Province (2011).
- Managed a project to develop a zero-waste strategy for a community development in the Eastern Cape Province (2010).
- Managed waste management status quo analysis for a District Municipality in the Eastern Cape Province (2003).
- For three consecutive years, managed elements of the evaluation of the environmental financial reserves of the three largest solid waste companies (Waste Management, Inc., Republic Services, Inc., Allied Waste, Inc.) and number of smaller waste companies in the USA as part of the annual financial audit process for SEC reporting purposes. Ensured compliance with RCRA and CERCLA environmental regulations.
- Managed elements of the evaluation of the environmental financial reserves of the largest hazardous waste company in the USA (Safety-Kleen, Inc.), as part of the audit process for SEC reporting purposes. Ensured compliance with RCRA and CERCLA environmental regulations.

**Environmental Due Diligence and Business Risk**

- Conducted environmental due diligence projects on behalf of the German Development Bank for a forestry pulp and paper operation in Swaziland (2010) and for a large diversified South African agricultural/agro-processing company (2011)
- Managed project for the Transnet National Ports Authority to identify the environmental risks and liabilities associated with the operations of the Port of Durban as part of a broader National initiative to assess business and financial risks relating to environmental management (2006).
- Managed project to determine the financial feasibility of various proposed tourism developments for the Kouga Development Agency in the Eastern Cape Province (2006)
- Contributed significantly to a study to determine the financial and environmental feasibility of three proposed tourism development projects at Coffee Bay on the Wild Coast (2004).
- Conducted sustainability and cost/benefit analysis of various waste water treatment options (including a marine pipeline at Hood Point) for the West Bank of East London (2004).
- Conducted analysis of permit fees and application processing costs for off-road vehicle use on the South African coastline for the Department of Environmental Affairs and Tourism, Marine & Coastal Management (2003).
- Involved in the determination of the historical cost element of environmental remediation insurance claims for a number of multinational

- companies, including Dow Chemicals, Inc. and International Paper, Inc.
- Evaluated the environmental budgeting process of the US Army and provided best practice guidance for improving the process.

#### **Policy and Guidelines**

- Development of Administration / Application Fee Structure for the Reclamation of Land, Coastal Use Permits, Coastal Waters
- Discharge Permits, Dumping Of Waste at Sea, Off-Road Vehicle Regulations Promulgated in Terms of the National Environmental Management Act: Integrated Coastal Management Act (Act No. 24 Of 2008) (2017).
- Managed project to develop an Estuarine Management Plan for the Buffalo River Estuary for the National Department of Environmental Affairs (2017).
- Managed project to develop a Coastal Management Programme for Amathole District Municipality, Eastern Cape (2015 – 2016).
- Managed project to develop a sustainability diagnostic report as part of the development of the Eastern Cape Development Plan and Vision 2030 (2013).
- Managed project for the Department of Environmental Affairs and Tourism, Marine & Coastal Management to determine the cost implications associated with the implementation of the Integrated Coastal Management Act (2007).
- Managed project to develop a Conservation Plan and Municipal Open Space System (MOSS) for Buffalo City Municipality (2007)
- Managed project to develop a Sanitation Policy and Strategy for Buffalo City Municipality, Eastern Cape (2004 – 2006).
- Managed project to develop an Integrated Environmental Management Plan and Integrated Coastal Zone Management Plan for Buffalo City Municipality, Eastern Cape (2004 – 2005).
- Managed projects to develop and implement an Environmental Management System (EMS) for the Chris Hani and Joe Gqabi (formerly Ukhahlamba) District Municipalities in the Eastern Cape generally in line with ISO14001 EMS standards (2004 – 2005).
- Managed project to develop a State of the Environment Report and Environmental Implementation Plans for Amathole, Chris Hani, OR Tambo and Joe Gqabi District Municipalities in the Eastern Cape Province (2005 – 20010).
- Conducted analysis of permit fees and application processing costs for off-road vehicle use on the South African coastline for the Department of Environmental Affairs and Tourism, Marine & Coastal Management (2003).

#### **Environmental auditing and compliance**

- Conducted environmental legal compliance audit for various large Transnet Freight Rail facilities (2018).
- Managed projects to develop Environmental & Social Management Systems (ESMS) in line with IFC Performance Standards for three (3) wind farms in South Africa (2015-2018).
- Managed project to develop an Environmental & Social Management System (ESMS) in line with IFC Performance Standards for a telecoms company in Zimbabwe on behalf of the German Development Bank (2013)
- Participated in numerous ISO14001 Environmental Management System (EMS) audits for large South African corporations including SAPPI, BHP

Billiton, SAB Miller, Western Platinum Refinery, Dorbyl Group and others (2002 – present).

- Reviewed the SHE data reporting system of International Paper, Inc. (IP) for three successive years as part of the verification of the IP SHE Annual Report, which included environmental assessments of 12 IP pulp and paper mills located throughout the USA.
- Conducted Environmental Management System (EMS) reviews for a number of large US corporations, including Gulfstream Aerospace Corporation

**Public financial accounting**

- While with Ernst & Young LLP, (USA), functioned as lead financial auditor for various public and private companies, mostly in the technology business segment of up to \$200 million in annual sales. Client experience included assistance in a \$100 million debt offering, a \$100 million IPO and SEC annual and quarterly reporting requirements.
- Completed three years of articles (training contract) in fulfilment of the certification requirements of the South African Institute of Chartered Accountants which included auditing, accounting and preparation of tax returns for many small to medium sized commercial entities.

**PUBLICATIONS**

**Refereed Publications**

- Carter, A.R. 1985. Reproductive morphology and phenology, and culture studies of *Gelidium pristoides* (Rhodophyta) from Port Alfred in South Africa. *Botanica Marina* 28: 303-311.
- Carter, A.R. 1993. Chromosome observations relating to bispore production in *Gelidium pristoides* (Gelidiales, Rhodophyta). *Botanica Marina* 36: 253-256.
- Carter, A.R. and R.J. Anderson. 1985. Regrowth after experimental harvesting of the agarophyte *Gelidium pristoides* (Gelidiales: Rhodophyta) in the eastern Cape Province. *South African Journal of Marine Science* 3: 111-118.
- Carter, A.R. and R.J. Anderson. 1986. Seasonal growth and agar contents in *Gelidium pristoides* (Gelidiales, Rhodophyta) from Port Alfred, South Africa. *Botanica Marina* 29: 117-123.
- Carter, A.R. and R.H. Simons. 1987. Regrowth and production capacity of *Gelidium pristoides* (Gelidiales, Rhodophyta) under various harvesting regimes at Port Alfred, South Africa. *Botanica Marina* 30: 227-231.
- Carter, A.R. and R.J. Anderson. 1991. Biological and physical factors controlling the spatial distribution of the intertidal alga *Gelidium pristoides* in the eastern Cape Province, South Africa. *Journal of the Marine Biological Association of the United Kingdom* 71: 555-568.

**Published reports**

- Water Research Commission. 2006. Profiling Estuary Management in Integrated Development Planning in South Africa with Particular Reference to the Eastern Cape. Project No. K5/1485.
- Turpie J., N. Sihlophe, A. Carter, T. Maswime and S. Hosking. 2006. 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. Un-published  
Water Research Commission Report No. K5/1485

**Conference Proceedings**

- Carter, A.R. 2002. Climate change and emission inventories in South Africa. Invited plenary paper at the 5th International System Auditors Convention, Pretoria. Held under the auspices of the South African Auditor & Training Certification Association Conference (SAATCA).
- Carter, A.R. 2003. Accounting for environmental closure costs and remediation liabilities in the South African mining industry. Proceedings of the Mining and Sustainable Development Conference. Chamber of Mines of South Africa, Vol. 2: 6B1-5
- Carter, A.R. and S. Fergus. 2004. Sustainability analysis of wastewater treatment options on the West Bank of East London, Buffalo City. Proceedings of the Annual National Conference of the International Association for Impact Assessment, South African Affiliate: Pages 295-301.
- Carter, A., L. Greyling, M. Parramon and K. Whittington-Jones. 2007. A methodology for assessing the risk of incurring environmental costs associated with port activities. Proceedings of the 1st Global Conference of the Environmental Management Accounting Network.
- Hawley, GL, McMaster AR and Carter AR. 2009, Carbon, carbon stock and life-cycle assessment in assessing cumulative climate change impacts in the environmental impact process. Proceedings of the Annual National Conference of the International Association for Impact Assessment, South African Affiliate.
- Hawley, GL, McMaster AR and Carter AR. 2010. The Environmental and Social Impact Assessment and associated issues and challenges. African, Caribbean and Pacific Group of States (ACP), Science and Technology Programme, Sustainable Crop Biofuels in Africa.
- Carter, A.R. 2011. A case study in the use of Life Cycle Assessment (LCA) in the assessment of greenhouse gas impacts and emissions in biofuel projects. 2nd Environmental Management Accounting Network- Africa Conference on Sustainability Accounting for Emerging Economies. Abstracts: Pages 69-70.

**CERTIFICATION**

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

**ALAN ROBERT CARTER**

Date: January 2019



**herewith certifies that**

**Alan Robert Carter**

Registration Number: 400332/04

**is registered as a**

**Professional Natural Scientist**

in terms of section 20(3) of the Natural Scientific Professions Act, 2003  
(Act 27 of 2003)  
in the following field(s) of practice (Schedule 1 of the Act)

Environmental Science

Effective **31 August 2004**

Expires **31 March 2020**



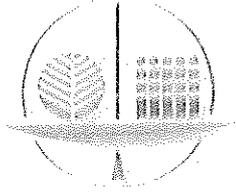
A handwritten signature in black ink, appearing to read 'Botha', written over a horizontal line.

Chairperson

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Chief Executive Officer





The Interim Certification Board  
for  
Environmental Assessment Practitioners  
of  
South Africa

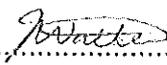
Alan Robert Carter

was certified as an

**ENVIRONMENTAL ASSESSMENT  
PRACTITIONER**

on this 1st day of March 2012

  
.....  
Chairperson

  
.....  
Secretary

## CONTACT DETAILS

<b>Name of Company</b>	<b>CES – Environmental and Social Advisory Services</b>
<b>Designation</b>	East London Branch
<b>Profession</b>	Senior Environmental Consultant
<b>Years with firm</b>	1 (One) Year
<b>E-mail</b>	c.clarke@cesnet.co.za
<b>Office number</b>	+27 (0)43 7267809 / 8313
<b>Nationality</b>	South African
<b>Professional Body</b>	South African Council for Scientific Natural Professionals (SACNASP): Candidate Natural Scientist (500022/14)
<b>Key areas of expertise</b>	<ul style="list-style-type: none"><li>➤ Climate Change</li><li>➤ Environmental Authorisations (including MPRDA applications)</li><li>➤ Environmental Management Plans</li><li>➤ Environmental Compliance Monitoring</li><li>➤ Geographic Information Systems</li><li>➤ Licensing and Permit Applications</li><li>➤ Feasibility Assessments</li><li>➤ Public Participation Process</li></ul>

## PROFILE

Caryn holds a M.Sc. Environmental Science (2012), B.Sc. Hon. Environmental Science (2010), and a B.Sc. Environmental Science and Economics (2009) from Rhodes University. Her M.Sc. thesis was titled “Responses to the linked stressors of Climate Change and HIV/AIDS amongst vulnerable rural households in the Eastern Cape, South Africa”. Her B.Sc. Hon. thesis investigated climate change perceptions, drought responses and views on carbon farming amongst commercial livestock and game farmers within the Great Fish River Valley, Eastern Cape, from which a paper was published in the African Journal of Range and Forage Science 2012, 29(1):13-23. Caryn has further completed a Carbon Footprint Analysis Course (2013).

Caryn’s expertise includes project management, environmental impact assessments including public participation, MPRDA applications, environmental compliance monitoring, various licensing and permit applications, feasibility assessments and GIS mapping. Caryn is a registered Candidate Natural Scientist under the South African Council for Natural Scientific Professions.

**EMPLOYMENT  
EXPERIENCE**

- Environmental Consultant, Coastal and Environmental Services  
August 2018 – current
- Environmental Consultant, Environmental Impact Management Services (EIMS)  
March 2013 – September 2015

**ACADEMIC  
QUALIFICATIONS**

- Rhodes University, 2012: M.Sc. (Environmental Science) with distinction
- Rhodes University, 2010: B.Sc. Hon. (Environmental Science) with distinction
- Rhodes University, 2009: B.Sc. (Environmental Science and Economics) with distinctions

**COURSES**

- *Terra Firma Academy, Johannesburg:*  
*“Carbon Footprint Analysis Course” (2013)*

**CONSULTING  
EXPERIENCE**

- Water Use Licensing for the Olivewood Gold Estate, Eastern Cape.
- Water Use Licensing for the Northern Cape Economic Development, Trade and Investment Promotion Agency (NCEDA) SEZ, Upington, Northern Cape.
- Environmental Sensitivity Assessment for the Lesotho Electricity Company 132 kV Mahlasela - Letseng Powerline, Lesotho.
- EIA, Water Use Licensing, and Coastal Discharge Permit for the Wild Coast Abalone Expansion, Eastern Cape.
- Conservation Management Plan for the CDC Wild Coast Mthatha SEZ, Eastern Cape.
- Basic Assessment and Mining License for the SANRAL Heidelberg to Lizmore road upgrade, Western Cape.
- Feasibility Assessment for the DAFF Multispecies Hatchery Development within the Eastern Cape.
- EIA for the proposed WildCoast SEZ Upper Ncise Aquaponics development, Mthatha Dam.
- Market Analysis for the DAFF Richards Bay Marine Cage Culture Aquaculture Feasibility Assessment.
- Basic Assessment for the proposed Eskom Lesokwana substation and associated powerlines, Gauteng.
- Basic Assessment and Water Use Licensing for the proposed SANRAL V3 Ndabakazi and R409 Interchange upgrade;
- Basic Assessment and Water Use Licensing for the proposed Kei Mouth Eco Estate.
- Public Participation for the Silver Wave Energy Exploration Rights;
- Integrated Water Use Licensing for Leiden Coal Mine;
- Integrated Water and Waste Management Plan for Vlakvarkfontein Coal Mine Consolidation;
- Environmental Impact Assessment for AOE Oil Production Right, Nanaga;
- Environmental Management Plan and compliance monitoring for the Noblesfontein Wind Energy Facility;
- Section 24G for the Tankatara Level Crossing to Coega Station service road

upgrade;

- Environmental Impact Assessment for BCMM Sunny South Housing Development;
- Environmental Impact Assessment for the AES Photovoltaic Solar Energy Facility near Aggeneys, Northern Cape;
- Vincent-Berea Local Spatial Development Framework (LSDF);
- Participatory Planning for Informal Settlements: National Upgrading Support Programme (NUSP);
- Basic Assessment for the formalisation of Mdantsane informal settlements;
- Water use License Applications for the formalisation of Mdantsane informal settlements;
- Basic Assessments for the Sidwadeni and Mngazi River Bridge and Access Road;
- Environmental Compliance Monitoring (ECO work) for Lusikisiki Waste Water Treatment Works;
- Environmental Compliance Monitoring for the East London Industrial Development Zone (ELIDZ) 1B West Infrastructure Services
- Environmental Compliance Monitoring for the reconstruction of Fleet Street, East London.
- Environmental Compliance Monitoring for the Sunny South Housing Development, East London.
- Numerous proposals, for example: Nelson Mandela Bay Metro Municipality's request for Environmental Consultant Services, Camdeboo Local Municipality's Integrated Waste Management Plan, Port St John's Environmental Management Plan, and the ELIDZ upgrade of Kemba electrical substation, Berlin, Eastern Cape; ELIDZ request for information; Transnet S24G Rectification process; Nyandeni Local Municipality's request for an Environmental Impact Assessment for the Ndayini Access Road.

## **CERTIFICATION**

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

**CARYN CLARKE**

Date: January 2019



**herewith certifies that**

**Caryn Lee Clarke**

Registration Number: 500022/14

**is registered as a**

**Candidate Natural Scientist**

in terms of section 20(3) of the Natural Scientific Professions Act, 2003  
(Act 27 of 2003)  
in the following field(s) of practice (Schedule 1 of the Act)

Environmental Science

Effective 23 July 2014

Expires 31 March 2020



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Chairperson

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Chief Executive Officer

