ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

for

THE PROOSED OLIPHANT ESTATE TOWNSHIP DEVELOMENT IN KIMBERLEY, NORTHERN CAPE PROVINCE

(Submitted as part of the Environmental Impact Assessment Report)

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DEFINITIONS AND TERMINOLOGY

Alternatives: Alternatives are different means of meeting the general purpose and need of a proposed activity. Alternatives may include location or site alternatives, activity alternatives, design alternatives, temporal alternatives or the 'do nothing' alternative.

Cumulative impacts: Impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities (e.g. discharges of nutrients and heated water to a river that combine to cause algal bloom and subsequent loss of dissolved oxygen that is greater than the additive impacts of each pollutant). Cumulative impacts can occur from the collective impacts of individual minor actions over a period and can include both direct and indirect impacts.

Direct impacts: Impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity (e.g. noise generated by blasting operations on the site of the activity). These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.

Drainage line: A drainage line is a lower category or order of watercourse that does not have a clearly defined bed or bank. It carries water only during or immediately after periods of heavy rainfall i.e. non-perennial and riparian vegetation may or may not be present

'Do nothing' alternative: The 'do nothing' alternative is the option of not undertaking the proposed activity or any of its alternatives. The 'do nothing' alternative also provides the baseline against which the impacts of other alternatives should be compared.

Ecosystem: A dynamic system of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.

Environment: the surroundings within which humans exist and that are made up of:

i. The land, water and atmosphere of the earth;
ii. Micro-organisms, plant and animal life;
iii. Any part or combination of (i) and (ii) and the interrelationships among and between them; and
iv. The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental impact: An action or series of actions that have an effect on the environment.

Environmental impact assessment: Environmental Impact Assessment (EIA), as defined in the NEMA EIA Regulations and in relation to an application to which scoping must be applied, means the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of that application.

Environmental management: Ensuring that environmental concerns are included in all stages of development, so that development is sustainable and does not exceed the carrying capacity of the environment.

Environmental management programme: A plan that organises and co-ordinates mitigation, rehabilitation and monitoring measures in order to guide the implementation of a proposal and its ongoing maintenance after implementation.

Expansion: means the modification, extension, alteration or upgrading of a facility, structure or infrastructure at which an activity takes place in such a manner that the capacity of the facility or the footprint of the activity is increased.

General waste: Waste which does not pose an immediate hazard or threat to health or to the environment' and includes the following waste flows: domestic waste, construction and demolition waste, business waste, insert waste.

Habitat: The place in which a species or ecological community occurs naturally.

Hazardous waste: Waste that has the potential to cause a negative threat/impact to humans and/or the environment. It includes, but is not limited to, batteries, neon lights, fluorescent lights, printer cartridges, oil, paint, paint containers, oil filters, IT equipment etc.

Indirect impacts: Indirect or induced changes that may occur as a result of the activity (e.g. the reduction of water in a stream that supply water to a reservoir that supply water to the activity). These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.

Interested and affected party: Individuals or groups concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, consumers, environmental interest groups, and the public.

Maintenance: means actions performed to keep a structure or system functioning or in service on the same location, capacity and footprint.

Pollution: A change in the environment caused by substances (radio-active or other waves, noise, odours, dust or heat emitted from any activity, including the storage or treatment or waste or substances.

Significant impact: An impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.

Waste: As per National Environmental Management: Waste Act means-

a) any substance, material or object, that is unwanted, rejected, abandoned, discarded or
b) disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to this Act; or
c) any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the Gazette, but any waste or portion of waste, referred to in paragraphs (a) and (b), ceases to be a waste.

Wetland: land which is transitional between terrestrial and aquatic systems were where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstance support vegetation typically adapted to life in saturated soil.

Watercourse: as per the National Water Act means -

(a) a river or spring;
(b) a natural channel in which water flows regularly or intermittently;
(c) a wetland, lake or dam into which, or from which, water flows; and
(d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks.

Waste: means any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to of the National Environmental Management: Waste Amendment Act 2014.

1. PROJECT DETAILS

1.1 Background

Oliphants Housing Estate (Pty) Ltd is proposing the construction of a mixed use residential development on the Remainder of Portion 18 of the Farm Roode Pan 70 in Kimberley in the Sol Plaatjie Local Municipality, Northern Cape Province. The property lies approximately 10km to the north of Kimberley between the Kamfers Dam and the Midlands Road, the total study area proposed for development is approximately 150 hectares. (**Figure 1**).

The Oliphant Estate Township Development entails the construction of 96 mixed use units, the proposed development is primarily comprised of mixed uses, with a mix of various typologies, including 12 High density residential erven (8 erven, developed at 80 du/ha); and 4 erven, to be developed at 60 dwelling units per hectare); 81 single residential erven, with a minimum of erf size of 260m2; Business purposes; a taxi ranks; and 1 erf as a Public Open Space (this is explored in more details in Chapter 2). Based on a pre-feasibility analysis, site identification, environmental screening process and market research studies undertaken, a favourable site has been identified for consideration and evaluation through an Environmental Impact Assessment (EIA) process.

The overarching objective for the Oliphant Estate Township Development is to drive economic growth within the northern section of Kimberley while minimising social and environmental impacts. The current housing backlog in the Sol Plaatjie Local Municipality is estimated at 4 000 units. In order to meet these objectives, local level environmental and planning issues will be assessed through the EIA through site-specific studies in order to delineate areas of sensitivity within the broader site; this will serve to inform the “developable area” of the site.

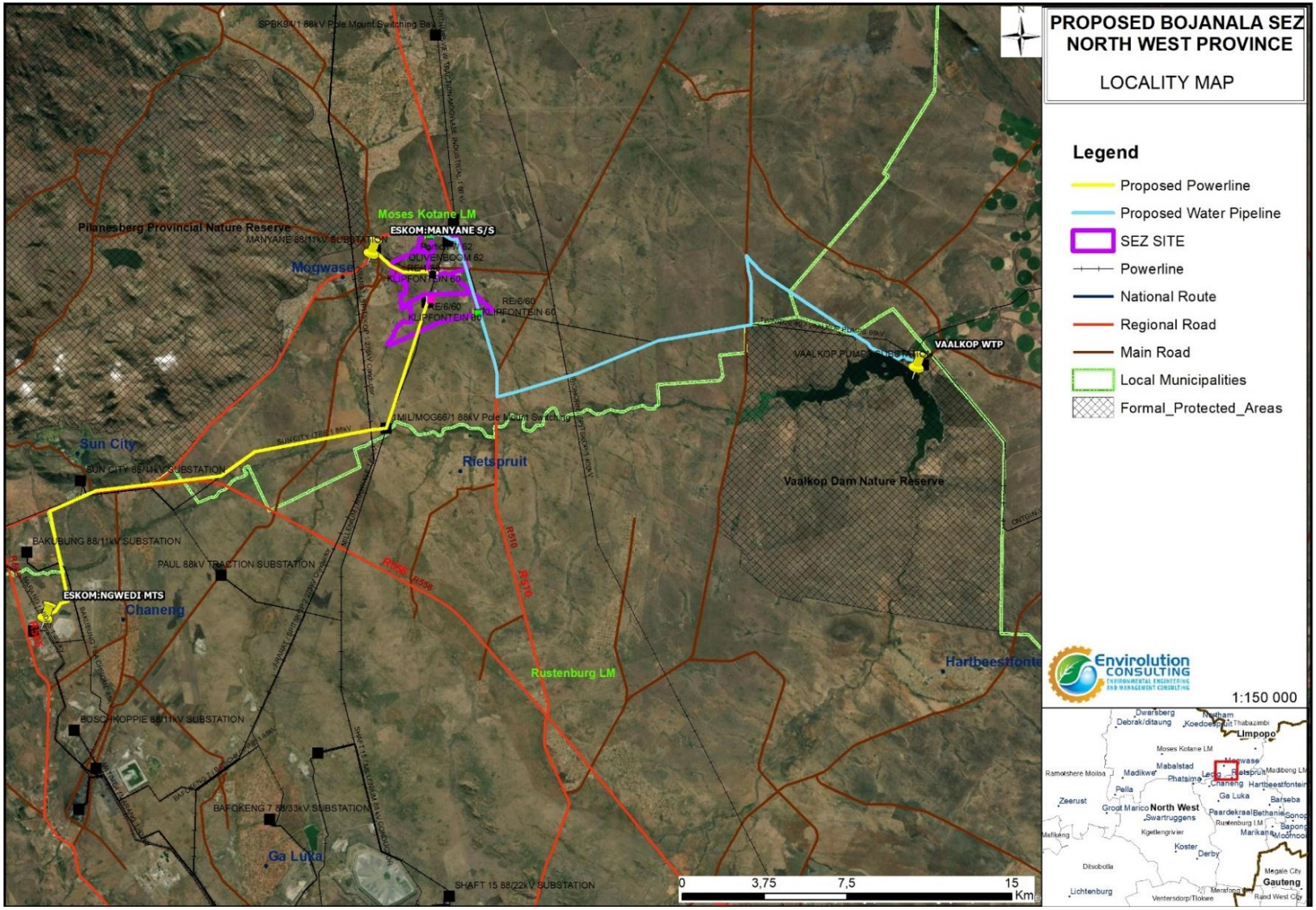

Figure 1: Locality of the proposed SEZ and associated infrastructures.

1.2 Project details

Property Description

The land on which the township is to be established is known as the Remainder of Portion 18 of the farm Roodepan No.70, District of Kimberley. The land is currently largely vacant, with Kamfers Dam situated to the eastern edge of the property. The property is known as the remainder of Portion 18 (Spare Camp) of the farm Roode Pan No. 70 and is situated in the District of Kimberley, Northern Cape and is approx. 150 hectares in extent with a centre coordinate: 28°41'11.72"S; 24°44'15.34"E (**Figure 1**).

Surrounding properties are also largely vacant, with Jacksonville and Roodepan townships situated to the north-west of the property. The property falls within the urban development boundary and is covered by the Sol Plaatjie Land Use Scheme. The current zoning of the property is Agricultural.

Table 1: Property description/Physical address

Province	Northern Cape
Municipality	Frances Baard DM, Sol Plaatjie LM (Ward 30)
Farm details	Portion 18 of Roode Pan No.70
SD 21 Digit Code	C03700000000070000018
Size	approx. 150 hectares
Physical Address	Direct access to Midlands Road
Site Coordinates	North-west:28°40'54.54"S; 24°43'53.73"E North east: 28°40'34.27"S; 24°44'23.25"E South-east: 28°41'16.12"S; 24°44'50.37"E South west: 28°41'29.92"S; 24°44'1.88"E

Description of Proposed Activity

The proposed development is primarily comprised of mixed uses, with a mix of various typologies, as summarised below:

- 12 High density residential erven (8 erven, developed at 80 du/ha); and 4 erven, to be developed at 60 dwelling units per hectare).
- 81 single residential erven, with a minimum of erf size of 260m2
- Business purposes
- A taxi ranks
- 1 erf as a Public Open Space

The entire development is envisaged to consist of 96 mixed use units, as outlined in the layout plan (**Figure 2**).

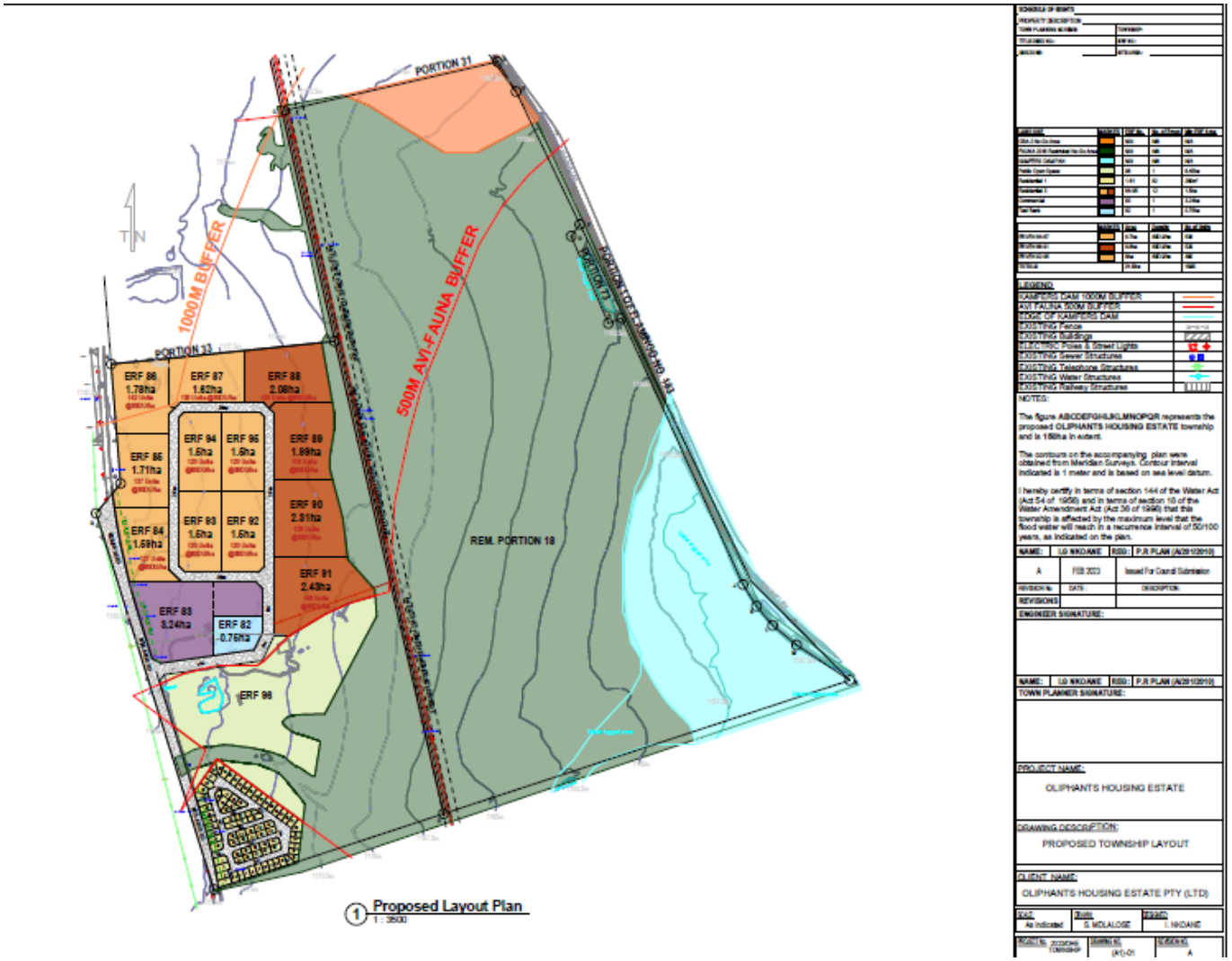

Figure 2: Proposed Layout

1.3 Site specific sensitivities/ attributes

From the conclusions of the detailed studies undertaken, sensitive areas within the development 500m corridor were identified and flagged for consideration and avoidance (where possible) by the Preferred Layout Plan. The following **highly sensitive areas/environmental features** as shown in **Figure 3** have been identified on the site:

- **No-go area**: Sensitive features present within this area include the waterbodies and their associated wetland areas;
- **Pan:** The Kamfersdam is a significant water bird habitat within the greater arid region. Many significant congregatory species and water birds utilise the dam. Furthermore, the Kamfersdam is the only breeding site for the Lesser Flamingo (Phoenicopterus minor) in South Africa and one of four regular sites in sub-Saharan Africa. The Maccoa Duck (*Oxyura maccoa*) may also be a potential breeder in the dam;
- **Critical Biodiversity Areas (CBAs):** The development plan as depicted in the 2018 report (Appendix E1) is still considered relevant and valid and has been incorporated as a No-Go zone. In addition, it is proposed to exclude the northern-most CBA2 area as part of the No-Go zone. A second CBA2 (yellow shaded area, which was not excluded from the 2018 development zone, occupies an area with secondary grassland and a highly transformed habitat in the savanna bushveld setting and high-density development should be avoided
- **500m buffer zone**: From an avifauna point of view, the 500m buffer zone must be retained as a no-go zone and the feasible development areas
- **1000m buffer zone**: The remaining area between the 500m and 1000m buffer zone should preferably be low density development.

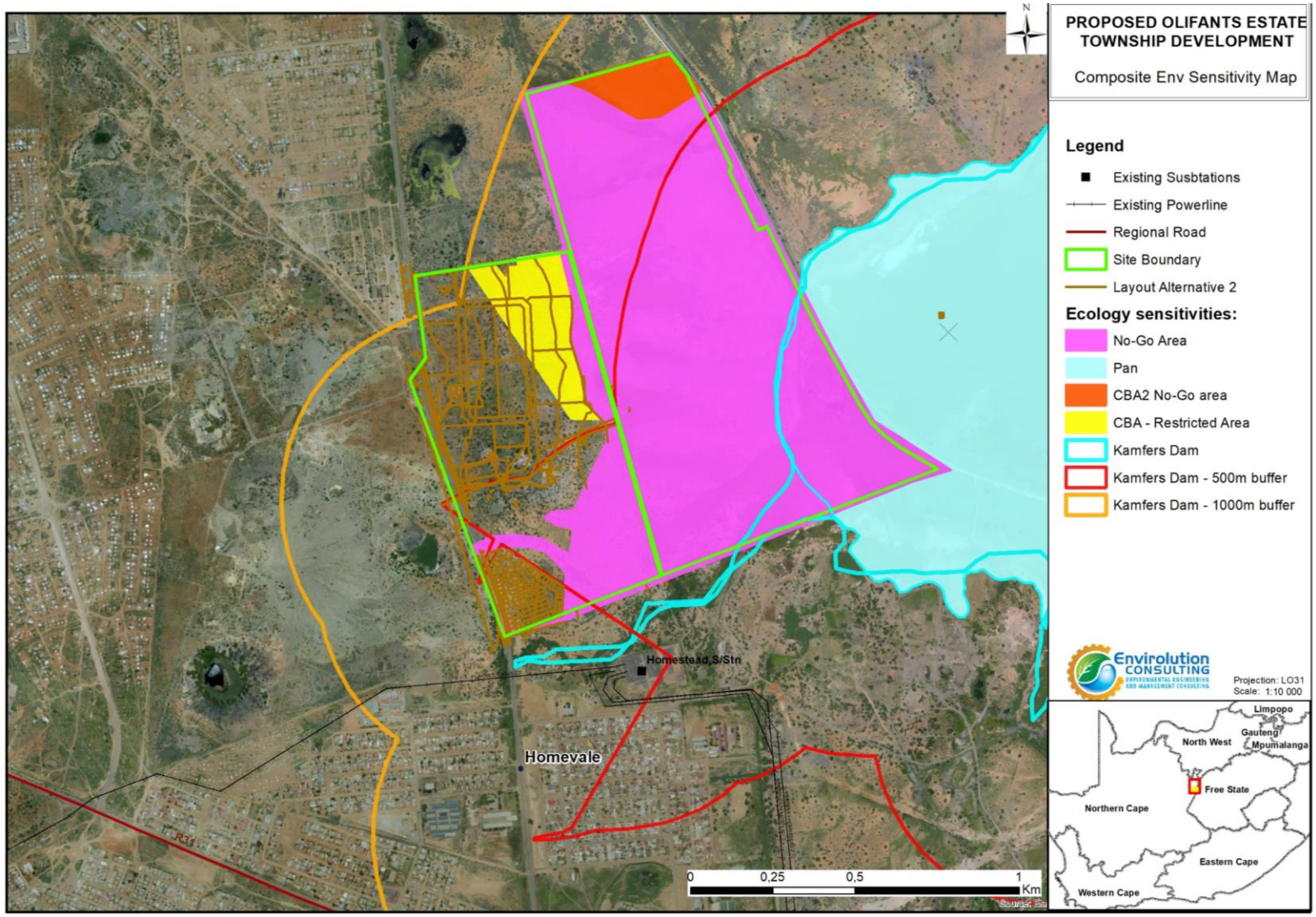

Figure 3: Composite Environmental Sensitivity Map showing areas of high sensitivity on the preferred Layout Plan

2. AIMS AND OBJECTIVES THE EMPr

An Environmental Management Programme (EMPr) is defined as "an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts associated with the planning, construction, operation and decommissioning of a project are avoided or mitigated, and that the positive benefits of the projects are enhanced." The objective of this EMPr is to provide consistent information and guidance for implementing the management and monitoring measures established in the permitting process and help achieve environmental policy goals. The purpose of an EMPr is to ensure continuous improvement of environmental performance, reducing negative impacts and enhancing positive effects during the construction and operation of the facility. An effective EMPr is concerned with both the immediate outcome as well as the long-term impacts of the project.

The EMPr provides specific environmental guidance for the construction and operation phases of a project, and is intended to manage and mitigate construction and operation activities so that unnecessary or preventable environmental impacts do not result. These impacts range from those incurred during start up (i.e. site clearing and site establishment), during the construction activities themselves (i.e. erosion, noise, dust, and visual impacts), during site rehabilitation (i.e. soil stabilisation, re-vegetation), during operation and during decommissioning (i.e. similar to construction phase activities).

This Environmental Management Programme has been compiled for the design, construction and operation of this facility and is applicable to all employees and contractors working on the pre-construction, construction, and operation and maintenance phases of the project. The document will be adhered to, updated as relevant throughout the project life cycle.

This EMPr has been compiled in accordance with Section 33 of the EIA Regulations and will be further developed in terms of specific requirements listed in any authorisations issued for the proposed project. The EMPr has been developed as a set of environmental specifications (i.e. principles of environmental management), which are appropriately contextualised to provide clear guidance in terms of the on-site implementation of these specifications (i.e. on-site contextualisation is provided through the inclusion of various monitoring and implementation tools).

This EMPr has the following objectives:

- Outline mitigation measures and environmental specifications which are required to be implemented for the planning, construction and rehabilitation, operation, and decommissioning phases of the project in order to manage and minimise the extent of potential environmental impacts associated with the facility.
- Ensure that all the phases of the project do not result in undue or reasonably avoidable adverse environmental impacts, and ensure that any potential environmental benefits are enhanced.
- Identify entities responsible for the implementation of the measures and outline functions and responsibilities.
- Propose mechanisms and frequency for monitoring compliance, and preventing long-term or permanent environmental degradation.
- Facilitate appropriate and proactive responses to unforeseen events or changes in project implementation that was not considered in the EIA process.

The management and mitigation measures identified within the Environmental Impact Assessment (EIA) process are systematically addressed in this EMPr, and ensure the minimisation of adverse environmental impacts to an acceptable level.

The developer must ensure that the implementation of the project complies with the requirements of all environmental authorisations, permits, and obligations emanating from relevant environmental legislation. This obligation is partly met through the development and the implementation of this EMPr and through its integration into the contract documentation. Since this EMPr is part of the EIA process for this facility, it is important that this document be read in conjunction with the final Scoping and EIA Reports compiled for this project. This will contextualise the EMPr and enable a thorough understanding of its role and purpose in the integrated environmental management process. Should there be a conflict of interpretation between this EMPr and the environmental authorisation, the stipulations in the environmental authorisation shall prevail over that of the EMPr, unless otherwise agreed by the authorities in writing. Similarly, any provisions in legislation overrule any provisions or interpretations within this EMPr.

This EMPr shall be binding on all the parties involved in the construction and operational phases of the project, and shall be enforceable at all levels of contract and operational management within the project. The document will be adhered to, and updated as relevant throughout the project life cycle.
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3. PROJECT TEAM

This draft Environmental Management Programme was compiled by:

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Expertise of Environmental Practitioner that prepared the EMPr

Envirolution Consulting (Pty) Ltd was contracted by Alley Roads Mega Projects (on behalf of Oliphants Housing Estate (Pty) Ltd) as the independent environmental consultants to undertake the Environmental Impact Assessment (EIA) Process for the proposed project. Envirolution is not a subsidiary or affiliated with neither Alley Roads Mega Projects nor Oliphants Housing Estate (Pty) Ltd. Furthermore, Envirolution Consulting does not have any interests in secondary developments that may arise out of the authorisation of the proposed project. Envirolution Consulting is a specialist environmental consulting company providing holistic environmental management services, including environmental impact assessments and planning to ensure compliance with environmental legislation and evaluate the risk of development; and the development and implementation of environmental management tools. Envirolution Consulting benefits from the pooled resources, diverse skills and experience in environmental field held by its team. We offer solutions to environmental issues that are key during our clients' planning and decision-making processes. The Envirolution Consulting team have considerable experience in environmental impact assessments and environmental management, and have been actively involved in undertaking environmental studies, for a wide variety of projects in South Africa, including those associated with linear developments.

As required by NEMA, the qualifications and experience of the key independent Environmental Assessment Practitioners (EAPs) undertaking the EIA is detailed below and Curriculum Vitae provided in **Appendix 2**.

Expertise of the EAP to carry out the EIA procedures

- **Project manager**: Sheila Bolingo, the principle author of this EIA Assessment holds an Msc degree in Environmental Management with 10 years of experience in the consulting field. Her key focus areas are on strategic environmental assessment and advice on environmental impact assessments; public participation; environmental management programmes, and mapping through ArcGIS for variety of environmental projects. She is currently involved in several diverse projects across the country.
- **Project Reviewer**: Gesan Govender is a registered Professional Natural Scientist and holds an Honours degree in Botany. He has over 17 years of experience within the field of environmental management. His key focus is on strategic environmental assessment and advice; management and co-ordination of environmental projects, which includes integration of environmental studies and environmental processes into larger engineering-based projects and ensuring compliance to legislation and guidelines; compliance reporting; the identification of environmental management

solutions and mitigation/risk minimising measures; and strategy and guideline development. He is currently responsible for the project management of EIA's for several diverse projects across the country.

Both authors of the report are EAPASA registered, the Curricula vitae for the consultants are included in **Appendix G1.**

Other team members include (External Specialists):
In order to adequately identify and assess potential environmental impacts associated with the proposed project, Envirolution Consulting has appointed the following specialists to conduct specialist impact assessments:

- **Avifauna Assessment –** Megan Diamond of Feathers Environmental Services
- **Aquatic and wetland Impact Assessment –** Antoinette Bootsman of Limosella Consulting
- **Terrestrial Ecological Assessment –** Antoinette Eyssell of Dimella EcoConsulting
- **Fauna Assessment -** Barbara Kasl
- **Heritage and Cultural Assessment -** Johan van Schalkwyk of Johan Heritage Consultant
- **Palaeontology -** Heidi Fourie
- **Air Quality Assessment-** Gertrude Mafusire of Rayten Engineering Solutions (Pty) Ltd
- **Noise Impact Assessment-** Steve Kalule of USK Consulting
- **Health Risk Assessment-** Elizabeth Masekoameng of ZABCOR Pty Ltd
- **Hydrology Assessment & Stormwater Management Plan-** Sivan Dhaver of SD Hydrological Services (Pty) Ltd

4. APPLICABLE LEGISLATION

Several laws and regulations apply to the protection of the environment and contain environmental principles and standards that need to be applied and permits and licences that need to be obtained. This EMPr will be subject to regulatory control under a range of State, Provincial and Local regulations. Such legislation largely embraces pollution prevention, resource use and conservation, and socio cultural (heritage) protection. This chapter reviews legislation pertaining to the proposed development.

According to Section 2 (1, 2 & 3) of the National Environmental Management Act No. 107 of 1998 (NEMA), all organs of state have to apply certain principles set out in NEMA when taking decisions that may significantly affect the environment. The key principles of this Act include that all "actions" that they approve must be economically, socially and environmentally sustainable. It further states that "people and their needs" must be at the forefront of "its concern" and their interests must be served equitably. The intent of this EMPr is to ensure that the developer conducts all its activities related to the operation and maintenance of this parking in accordance with the provisions of the NEMA, and has taken into account the provisions of the Constitution and the principles of Integrated Environmental Management. Key environmental legislations that are applicable to the project are outlined in Table 2.

Table 2: technical details for the proposed facility

LEGISLATION	APPLICABLE REQUIREMENTS	RELEVANT AUTHORITY
National Legislation		
National Environmental Management Act (Act No 107 of 1998)	The EIA Regulations have been promulgated in terms of Chapter 5 of the Act. Listed activities which may not commence without an environmental authorisation are identified within these Regulations. In terms of S24(1) of NEMA, the potential impact on the environment associated with these listed activities must be assessed and reported on to the competent authority charged by NEMA with granting of the relevant environmental authorisation. In terms of the EIA Regulations of 2014 (GNR 326) and the 3 Listing Notices (GNR 324, 325 & 327). a Basic Assessment Process is required to be undertaken for the proposed project. ***In terms of sections 24(2) and 24D of the National Environmental Management Act (Act No. 107 of 1998), as read with the Environmental Impact Assessment (EIA) Regulations of GN R982, as amended by GN R326) Oliphants Housing Estate (Pty) Ltd requires an Environmental Authorization for the project.***	Northern Cape Department: Agriculture, Environmental Affairs, Rural Development and Land Reform – competent authority
National Environmental Management Act (Act No 107 of 1998)	In terms of the Duty of Care Provision in S28(1) the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to ensure that any pollution or degradation of the environment associated with this project is avoided, stopped or minimised. In terms of NEMA, it has become the legal duty of a project proponent to consider a project holistically, and to consider the cumulative effect of a variety of impacts.	Northern Cape Department: Agriculture, Environmental Affairs, Rural Development and Land Reform

LEGISLATION	APPLICABLE REQUIREMENTS	RELEVANT AUTHORITY
	While no permitting requirements arise from this section of the Act, this will be applicable during construction in order to ensure minimization of impacts on the environment.	
National Water Act (Act No 36 of 1998)	Water uses under S21 of the Act must be licensed, unless such water use falls into one of the categories listed in S22 of the Act or falls under the general authorisation (and then registration of the water use is required). Consumptive water uses may include the taking of water from a water resource and storage - Sections 21a and b. Non-consumptive water uses may include impeding or diverting of flow in a water course - Section 21c; and altering of bed, banks or characteristics of a watercourse - Section 21i. In terms of Section 19, the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to prevent and remedy the effects of pollution to water resources from occurring, continuing or recurring. ***A Water Use License is required for the development as per the following specific water uses:*** ▪ ***Section 21(c): Impeding or diverting the flow of water in a watercourse; and*** ▪ ***Section 21(i): Altering the bed, banks, course or characteristics of a watercourse.*** ***This is a legislative process governed by Department of Water and Sanitation (DWS) for the authorisation of all water used defined in Section 21.***	Department of Water and Sanitation (DWS)
National Environmental Management: Air Quality Act (Act No 39 of 2004)	S18, S19, and S20 of the Act allow certain areas to be declared and managed as "priority areas." Declaration of controlled emitters (Part 3 of Act) and controlled fuels (Part 4 of Act) with relevant emission standards. GN R 827 – National Dust Control Regulations prescribes general measures for the control of dust in all areas ***While no permitting or licensing requirements arise from this legislation, this Act will find application during the construction phase of the project. Dust control regulations promulgated in November 2013 may require the implementation of a dust management plan during the construction phase of the project for dust management***	Local Municipality
National Heritage Resources Act (Act No 25 of 1999)	» S38 states that Heritage Impact Assessments (HIAs) are required for certain kinds of development including » The construction of a road, power line, pipeline, canal or other similar linear development or barrier exceeding 300 m in length; » Any development or other activity which will change the character of a site exceeding 5 000 m^2 in extent	South African Heritage Resources Agency (SAHRA) Provincial Heritage Resources Authority

LEGISLATION	APPLICABLE REQUIREMENTS	RELEVANT AUTHORITY
	» The relevant Heritage Authority must be notified of developments such as linear developments (i.e. roads and power lines), bridges exceeding 50 m, or any development or other activity which will change the character of a site exceeding 5 000 m^2; or the re-zoning of a site exceeding 10 000 m^2 in extent. This notification must be provided in the early stages of initiating that development, and details regarding the location, nature and extent of the proposed development must be provided. » Stand-alone HIAs are not required where an EIA is carried out as long as the EIA contains an adequate HIA component that fulfils the provisions of S38. In such cases only those components not addressed by the EIA should be covered by the heritage component. ***In accordance to Section 38 a Heritage Impact Assessments (HIAs) will be undertaken for the following associated developments: (a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length; (b) the construction of a bridge or similar structure exceeding 50 m in length; (c) any development or other activity which will change the character of a site (i) exceeding 5000m in extent***	
National Environmental Management: Biodiversity Act (Act No 10 of 2004)	Chapter 4, Part 2 of the National Environmental Management: Biodiversity Act (No. 10 of 2004), (NEMBA) provides for listing of plant and animal species as threatened or protected. If a species is listed as threatened, it must be further classified as Critically Endangered, Endangered or Vulnerable. These species are commonly referred to as TOS listed. The Act defines these classes as follows: o Critically endangered species: any indigenous species facing an extremely high risk of extinction in the wild in the immediate future. o Endangered species: any indigenous species facing a high risk of extinction in the wild in the near future, although it is not a critically endangered species. o Vulnerable species: any indigenous species facing an extremely high risk of extinction in the wild in the medium-term future; although it is not a critically endangered species or an endangered species. o Protected species: any species which is of such high conservation value or national importance that it requires national protection. Species listed in this category will include, among others, species listed in terms of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).	Northern Cape Department: Agriculture, Environmental Affairs, Rural Development and Land Reform

LEGISLATION	APPLICABLE REQUIREMENTS	RELEVANT AUTHORITY
	Certain activities, known as 'Restricted Activities', are regulated on listed species using permits by a special set of regulations published under the Act. Restricted activities regulated under the act are keeping, moving, having in possession, importing and exporting, and selling. The first list of threatened and protected species published under NEMBA was published in the government gazette on the 23rd of February 2007 along with the Regulations on Threatened or Protected Species. **The 2018 assessment recorded three (3) provincially protected plant species on the site, namely large populations of the geophyte *Ammocharis coranica*, the succulent *Aloe grandidentata* and a few individuals of the succulent *Orbea lutea*.** **At the time of this assessment, only *Ammocharis carinica* and *Aloe grandidentata* were recorded. It is likely that a denser grass layer obscured the small *Orbea lutea* and it is highly likely to still be present on the larger Secondary Project areas of influence (PAOI). All three these plant species can easily be transplanted and relocated to suitable habitat outside the development footprint on the site.**	
National Forests Act (Act No. 84 of 1998)	In terms of S5(1) no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, except under a license granted by the Minister to an (applicant and subject to such period and conditions as may be stipulated" GN 908 provides a list of protected tree species. ***Of these trees, Vachellia erioloba (camel thorn), occurs abundantly in the Kimberly area. However, this tree was not noted on the site and no other protected trees were expected to be present. Some tree stumps were recorded, and it is assumed that trees are harvested for firewood. This tree makes excellent firewood and could have been harvested if it was historically present. The likelihood of being present on Portion 18 is low.***	Northern Cape Department: Agriculture, Environmental Affairs, Rural Development and Land Reform
National Veld and Forest Fire Act (Act 101 of 1998)	In terms of S13 the landowner would be required to burn firebreaks to ensure that should a veldfire occur on the property, that it does not spread to adjoining land. In terms of S13 the landowner must ensure that the firebreak is wide and long enough to have a reasonable chance of preventing the fire from spreading, not causing erosion, and is reasonably free of inflammable material. In terms of S17, the applicant must have such equipment, protective clothing, and trained personnel for extinguishing fires. ***While no permitting or licensing requirements arise from this legislation, and this Act will find application during the construction and operational phase of the project.***	Department of Agriculture, Forestry and Fisheries
Hazardous Substances Act (Act	This Act regulates the control of substances that may cause injury, or ill health, or death due to their toxic, corrosive, irritant, strongly	Department of Health

LEGISLATION	APPLICABLE REQUIREMENTS	RELEVANT AUTHORITY
No 15 of 1973)	sensitising or inflammable nature or the generation of pressure thereby in certain instances and for the control of certain electronic products. To provide for the rating of such substances or products in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, modification, disposal or dumping of such substances and products. » Group I and II: Any substance or mixture of a substance that might by reason of its toxic, corrosive etc, nature or because it generates pressure through decomposition, heat or other means, cause extreme risk of injury etc., can be declared as Group I or Group II substance » Group IV: any electronic product; and » Group V: any radioactive material. The use, conveyance, or storage of any hazardous substance (such as distillate fuel) is prohibited without an appropriate license being in force. ***While no permitting or licensing requirements arise from this legislation, and this Act will find application during the construction and operational phase of the project.***	
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)	The Minister may by notice in the *Gazette* publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment. The Minister may amend the list by – » Adding other waste management activities to the list. » Removing waste management activities from the list. » Making other changes to the particulars on the list. In terms of the Regulations published in terms of this Act (GN 921), A Basic Assessment or Environmental Impact Assessment is required to be undertaken for identified listed activities (Category A and B) while Category C Activities (such as storage of waste) must be undertaken in accordance with the necessary norms and standards. Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that: » The containers in which any waste is stored, are intact and not corroded or in » any other way rendered unlit for the safe storage of waste. » Adequate measures are taken to prevent accidental spillage or leaking.	Chemicals and Waste Management “Department” - General waste

LEGISLATION	APPLICABLE REQUIREMENTS	RELEVANT AUTHORITY
	» The waste cannot be blown away. » Nuisances such as odour, visual impacts and breeding of vectors do not arise; and » Pollution of the environment and harm to health are prevented. ***In terms of GNR921, no waste license is required for the project. No waste license activities are applicable to this project. The developer will however be required to store and manage waste in accordance with the requirements of this Act and associated Standards.***	
National Road Traffic Act (Act No 93 of 1996)	» The technical recommendations for highways (TRH 11): "Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads" outline the rules and conditions which apply to the transport of abnormal loads and vehicles on public roads and the detailed procedures to be followed in applying for exemption permits are described and discussed. » Legal axle load limits and the restrictions imposed on abnormally heavy loads are discussed in relation to the damaging effect on road pavements, bridges, and culverts. » The general conditions, limitations, and escort requirements for abnormally dimensioned loads and vehicles are also discussed and reference is made to speed restrictions, power/mass ratio, mass distribution, and general operating conditions for abnormal loads and vehicles. Provision is also made for the granting of permits for all other exemptions from the requirements of the National Road Traffic Act and the relevant Regulations. ***An abnormal load/vehicle permit may be required to transport the various components to site for construction. These include: Route clearances and permits will be required for vehicles carrying abnormally heavy or abnormally dimensioned loads. Transport vehicles exceeding the dimensional limitations (length) of 22m.***	South African National Roads Agency Limited (SANRAL) (national roads) Provincial Department of Transport
Conservation of Agricultural Resources Act (Act No 43 of 1983)	Regulation 15 of GNR1048 provides for the declaration of weeds and invader plants, and these are set out in Table 3 of GNR1048. Declared Weeds and Invaders in South Africa are categorised according to one of the following categories: Category 1 plants: are prohibited and must be controlled. Category 2 plants: (commercially used plants) may be grown in demarcated areas providing that there is a permit and that steps are taken to prevent their spread. Category 3 plants: (ornamentally used plants) may no longer be planted; existing plants may remain, as long as all reasonable steps are taken to prevent the spreading thereof, except within the floodline of watercourses and wetlands. These regulations provide that Category 1, 2 and 3 plants must not	DAFF

LEGISLATION	APPLICABLE REQUIREMENTS	RELEVANT AUTHORITY
	occur on land and that such plants must be controlled by the methods set out in Regulation 15E. ***While no permitting or licensing requirements arise from this legislation, this Act will find application during the EIA process and will continue to apply throughout the life cycle of the project. In this regard, soil erosion prevention and soil conservation strategies must be developed and implemented.***	
Subdivision of Agricultural Land Act (Act No 70 of 1970)	Details the subdivision of agricultural land and provisions under which the act is triggered. It also provides for the approval of such division by the Minister of Agriculture. Applies for subdivision of all agricultural land and long-term leasing of portions of agricultural land. ***Long-term leases on portions or subdivision of the site properties will require an approval of the Minister of Agriculture. An application to DAFF will need to be submitted detailing the areas to be subdivided or leased for the purposes of the proposed development. An application in terms of SALA will need to be undertaken and submitted following the issuing of an environmental authorisation for the proposed project.***	. Local Municipality – competent authority Provincial Departments of Agriculture and Environment (DAFF)- commenting authority
Spatial Planning and Land Use Management Act 16 OF 2013	**This Act** has the main objectives to: • provide for a uniform, effective and comprehensive system of spatial planning and land use management for the Republic; • ensure that the system of spatial planning and land use management promotes social and economic inclusion; • provide for development principles and norms and standards; • provide for the sustainable and efficient use of land; • provide for cooperative government and intergovernmental relations amongst the national, Regulations under the SPLUMA not in force yet. ***Legislation that regulates Land Use Planning has led to "spatial planning tools" that are contained in Municipal and District Strategic Management Frameworks (SMFs), Strategic Development Initiatives (SDIs) and Municipal By-laws***	Local Municipality
Provincial Legislation		
Northern Cape Nature Conservation Act, Act No. 9 of 2009	This Act provides for the sustainable utilisation of wild animals, aquatic biota and plants; provides for the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora; provides for offences and penalties for contravention of the Act; provides for the appointment of nature conservators to implement the provisions of the Act; and provides for the issuing of permits and other authorisations. Amongst other regulations, the following may apply to the current project: • Boundary fences may not be altered in such a way as to prevent wild animals from freely moving onto or off of a property; • Aquatic habitats may not be destroyed or damaged; • The owner of land upon which an invasive species is found	Northern Cape Department: Agriculture, Environmental Affairs, Rural Development and Land Reform – competent authority

LEGISLATION	APPLICABLE REQUIREMENTS	RELEVANT AUTHORITY
	(plant or animal) must take the necessary steps to eradicate or destroy such species. • The Act provides lists of protected plant and animal species for the Province. • A permit is required to be obtained to impact on any species listed in terms of this Act or associated Regulations.	

5. ROLES AND RESPONSIBILITIES

The effective implementation of this generic EMPr is dependent on established and clear roles, responsibilities and reporting lines within an institutional framework. This section of the EMPr gives guidance to the various environmental roles and reporting lines, however, project specific requirements will ultimately determine the need for the appointment of specific person(s) to undertake specific roles and or responsibilities. As such, it must be noted that in the event that no specific person, for example, an environmental control officer (ECO) is appointed, the holder of the EA remains responsible for ensuring that the duties indicated in this document for action by the ECO are undertaken. The stakeholders are discussed below.

5.1 Developer Project Manager (DPM)

The Project Developer is accountable for ensuring compliance with the EMPr and any conditions of approval from the competent authority (CA). Where required, an environmental control officer (ECO) must be contracted by the Project Developer to objectively monitor the implementation of the EMPr according to relevant environmental legislation, and the conditions of the environmental authorisation (EA). The Project Developer is further responsible for providing and giving mandate to enable the ECO to perform responsibilities, and he must ensure that the ECO is integrated as part of the project team while remaining independent.

Responsibilities

- Be fully conversant with the conditions of the EA;
- Ensure that all stipulations within the EMPr are communicated and adhered to by the Developer and its Contractor(s);
- Issuing of site instructions to the Contractor for corrective actions required;
- Monitor the implementation of the EMPr throughout the project by means of site inspections and meetings. Overall management of the project and EMPr implementation; and
- Ensure that periodic environmental performance audits are undertaken on the project implementation.

5.2 Developer Site Supervisor (DSS)

The DSS reports directly to the DPM, oversees site works, liaises with the contractor(s) and the ECO. The DSS is responsible for the day to day implementation of the EMPr and for ensuring the compliance of all contractors with the conditions and requirements stipulated in the EMPr.

Responsibilities

- Ensure that all contractors identify a contractor's Environmental Officer (EO);
- Must be fully conversant with the conditions of the EA. Oversees site works, liaison with Contractor, DPM and ECO;
- Must ensure that all landowners have the relevant contact details of the site staff, ECO and EO;
- Issuing of site instructions to the Contractor for corrective actions required;
- Will issue all non-compliances to contractors; and
- Ratify the Monthly Environmental Report.

5.3 The Environmental Control Officer (ECO)

The Environmental Control Officer (ECO) is appointed by the developer as an independent monitor of the implementation of the EMPr. He/she must form part of the project team and be involved in all

aspects of project planning that can influence environmental conditions on the site. The ECO must attend relevant project meetings, conduct inspections to assess compliance with the EMPr and be responsible for providing feedback on potential environmental problems associated with the development. In addition, the ECO is responsible for:

- Assisting in ensuring that the necessary environmental authorisations and permits have been obtained prior to construction commencing.
- Reviewing the Contractor's construction Method Statements.
- Monthly site inspections of all construction areas with regard to compliance with the EMPr.
- Monitoring and verifying adherence to the EMPr, the EA and approved Method Statements at all times.
- Monitoring and verifying that environmental impacts are kept to a minimum.
- Taking appropriate action if the specifications are not followed.
- Monitoring the undertaking by the Contractor of environmental awareness training for all new personnel coming onto site.
- Advising on the removal of person(s) and/or equipment not complying with the specifications.
- Auditing the implementation of the EMPr and compliance with the EA on a monthly basis.
- Compiling a final audit report regarding the EMPr and its implementation during the construction period after completion of the contract and submitting this report to the Employer and the authorising authority.

The ECO has the right to enter the site and do monitoring and auditing at any time, subject to compliance with health and safety requirements applicable to the site (e.g. wearing of safety boots and protective head gear).

Liaison with Authorities

The ECO will be responsible for liaising with the competent authority. The ECO must submit monthly environmental audit reports to the authorities. These audit reports must contain information on the contractor and developer's levels of compliance with the EMPr. The audit report must also include a description of the general state of the site, with specific reference to sensitive areas and areas of non-conformance. The ECO must indicate suggested corrective action measures to eliminate the cause of the non-conformance incidents. In order to keep a record of any impacts, an Environmental Log Sheet (refer to **Appendix 1**) is to be kept on a continual basis.

Liaison with Contractors

The ECO is responsible for informing the contractors of any decisions that are taken concerning environmental management during the construction phase. This would also include informing the contractors of the necessary corrective actions to be taken.

5.4 Developer Environmental Officer (dEO)

The dEOs will report to the Project Manager and are responsible for implementation of the EMPr, environmental monitoring and reporting, providing environmental input to the Project Manager and Contractor's Manager, liaising with contractors and the landowners as well as a range of environmental coordination responsibilities.

Responsibilities

- Be fully conversant with the EMPr;

- Be familiar with the recommendations and mitigation measures of this EMPr, and implement these measures;
- Ensure that all stipulations within the EMPr are communicated and adhered to by the Employees, Contractor(s);
- Confine the development site to the demarcated area;
- Conduct environmental internal audits with regards to EMPr and authorisation compliance (on cEO);
- Assist the contractors in addressing environmental challenges on site;
- Assist in incident management:
- Reporting environmental incidents to developer and ensuring that corrective action is taken, and lessons learnt shared;
- Assist the contractor in investigating environmental incidents and compile investigation reports;
- Follow-up on pre-warnings, defects, non-conformance reports;
- Measure and communicate environmental performance to the Contractor;
- Conduct environmental awareness training on site together with ECO and cEO;
- Ensure that the necessary legal permits and / or licenses are in place and up to date;
- Acting as Developer's Environmental Representative on site and work together with the ECO and contractor;

5.5 Contractor and Service Providers:

The Contractor appoints the Service Providers and has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract are in line with the EMPr and that Method Statements are implemented as described. External contractors must ensure compliance with this EMPr while performing the onsite activities as per their contract with the Project Developer. The contractors are required, where specified, to provide Method Statements setting out in detail how the impact management actions contained in the EMPr will be implemented during the development or expansion for overhead electricity transmission and distribution infrastructure activities.

Responsibilities

- project delivery and quality control for the development services as per appointment;
- employ a suitably qualified person to monitor and report to the Project Developer's appointed person on the daily activities on-site during the construction period;
- ensure that safe, environmentally acceptable working methods and practices are implemented and that equipment is properly operated and maintained, to facilitate proper access and enable any operation to be carried out safely;
- attend on site meeting(s) prior to the commencement of activities to confirm the procedure and designated activity zones;
- ensure that contractors' staff repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in EMPr, to the satisfaction of the ECO.

5.6 Contractor Environmental Officer (cEO)

Each Contractor affected by the EMPr should appoint a cEO, who is responsible for the on-site implementation of the EMPr (or relevant sections of the EMPr). The Contractor's representative can be the site agent; site engineer; a dedicated environmental officer; or an independent consultant. The Contractor must ensure that the Contractor's Representative is suitably qualified to perform the necessary tasks and is appointed at a level such that she/he can interact effectively with other site Contractors, labourers, the Environmental Control Officer and the public. As a minimum the cEO shall meet the following criteria:

- Be on site throughout the duration of the project and be dedicated to the project;
- Ensure all their staff are aware of the environmental requirements, conditions and constraints with respect to all of their activities on site;
- Implementing the environmental conditions, guidelines and requirements as stipulated within the EA, EMPr and Method Statements;
- Attend the Environmental Site Meeting;
- Undertaking corrective actions where non-compliances are registered within the stipulated timeframes;
- Report back formally on the completion of corrective actions;
- Assist the ECO in maintaining all the site documentation;
- Prepare the site inspection reports and corrective action reports for submission to the ECO;
- Assist the ECO with the preparing of the monthly report; and
- Where more than one Contractor is undertaking work on site, each company appointed as a Contractor will appoint a cEO representing that company.

6. ENVIRONMENTAL DOCUMENTATION REPORTING AND COMPLIANCE

OBJECTIVE: To ensure accountable and demonstrated implementation of the EMPr, a number of reporting systems, documentation controls and compliance mechanisms must be in place for all overhead electricity transmission and distribution infrastructure projects as a minimum requirement.

6.1 Document control/Filing system

The holder of the EA is solely responsible for the upkeep and management of the EMPr file. At a minimum, all documentation detailed below will be stored in the EMPr file. A hard copy of all documentation shall be filed, while an electronic copy may be kept where relevant. A duplicate file will be maintained in the office of the DSS (where applicable). This duplicate file must remain current and up-to-date. The filing system must be updated and relevant documents added as required. The EMPr file must be made available at all times on request by the CA or other relevant authorities. The EMPr file will form part of any environmental audits undertaken as prescribed in the EIA Regulations.

6.2 Documentation to be available

At the outset of the project the following preliminary list of documents shall be placed in the filing system and be accessible at all times:

- Full copy of the signed EA from the CA in terms of NEMA, granting approval for the development or expansion;
- Copy of the generic and site specific EMPr as well as any amendments thereof;
- Copy of declaration of implementing generic EMPr and subsequent approval of site specific EMPr and amendments thereof;
- All method statements;
- Completed environmental checklists;
- Minutes and attendance register of environmental site meetings;
- An up-to-date environmental incident log;
- A copy of all instructions or directives issued;
- A copy of all corrective actions signed off. The corrective actions must be filed in such a way that a clear reference is made to the non-compliance record;
- Complaints register.

6.3 Weekly Environmental Checklist

The ECOs are required to complete a Weekly Environmental Checklist, the format of which is to be agreed prior to commencement of the activity. The ECOs are required to sign and date the checklist, retain a copy in the EMPr file and submit a copy of the completed checklist to the DSS on a weekly basis.

The checklists will form the basis for the Monthly Environmental Reports. Copies of all completed checklists will be attached as Annexures to the Environmental Audit Report as required in terms of the EIA Regulations.

6.4 Environmental site meetings

Minutes of the environmental site meetings shall be kept. The minutes must include an attendance register and will be attached to the Monthly Report that is distributed to attendees. Each set of minutes must clearly record “Matters for Attention” that will be reviewed at the next meeting.

6.5 Required Method Statements

The method statement will be done in such detail that the ECOs are enabled to assess whether the contractor's proposal is in accordance with the EMPr.

The method statement must cover applicable details with regard to:

- development procedures;
- materials and equipment to be used;
- getting the equipment to and from site;
- how the equipment/ material will be moved while on site;
- how and where material will be stored;
- the containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- timing and location of activities;
- compliance/ non-compliance with the EMPr; and
- any other information deemed necessary by the ECOs.

The ECOs shall monitor and ensure that the contractors perform in accordance with these method statements.

6.6 Environmental Incident Log (Diary)

The ECOs are required to maintain an up-to-date and current Environmental Incident Log (environmental diary). The Environmental Incident Log is a means to record all environmental incidents and/or all non-compliance notice would not be issued. An environmental incident is defined as:

- Any deviation from the listed impact management actions (listed in this EMPr) that may be addressed immediately by the ECOs. (For example, a contractor's staff member littering or a drip tray that has not been emptied);
- Any environmental impact resulting from an action or activity by a contractor in contravention of the environmental stipulations and guidelines listed in the EMPr which as a single event would have a minor impact but which if cumulative and continuous would have a significant effect (for example no toilet paper available in the ablutions for an afternoon); and
- General environmental information such as road kills or injured wildlife.

The ECOs are to record all environmental incidents in the Environmental Incident Log. All incidents regardless of severity must be reported to the Developer. The Log is to be kept in the EMPr file and at a minimum the following will be recorded for each environmental incident:

- The date and time of the incident;
- Description of the incident;
- The name of the Contractor responsible;
- The incident must be listed as significant or minor;
- If the incident is listed as significant, a non-compliance notice must be issued, and recorded in the log;
- Remedial or corrective action taken to mitigate the incident; and
- Record of repeat minor offences by the same contractor or staff member.

*See **Appendix 1** for an example of an Environmental Incident Log.*

6.7 Non-compliance

A non-compliance notice will be issued to the responsible contractor by the ECOs via the DSS or Project Manager. The non-compliance notice will be issued in writing; a copy filed in the EMPr file and will at a minimum include the following:

- Time and date of the non-compliance;
- Name of the contractor responsible;

- Nature and description of the non-compliance;
- Recommended / required corrective action; and
- Date by which the corrective action to be completed.
- The contractors shall act immediately when a notice of non-compliance is received and correct whatever is the cause for the issuing of the notice. Complaints received regarding activities on the development site pertaining to the environment shall be recorded in a dedicated register and the response 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 shall be reported to the relevant CA 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 a deviation from the environmental conditions, impact management outcomes and impact management actions , as approved in generic and site specific EMPr as relevant as set out in the EMPr, which deviation has, or may cause, an environmental impact.

6.8 Corrective action records

For each non-compliance notice issued, a documented corrective action must be recorded. On receiving a non-compliance notice from the DSS, the contractor's cEO will ensure that the corrective actions required take place within the stipulated timeframe. On completion of the corrective action the cEO is to issue a Corrective Action Report in writing to the ECOs. If satisfied that the corrective action has been completed, the ECOs are to sign-off on the Corrective Action Report, and attach the report to the non-compliance notice in the EMPr file. A corrective action is considered complete once the report has signed off by the ECOs.

6.9 Photographic record

A digital photographic record will be kept. The photographic record will be used to show before, during and post rehabilitation evidence of the project as well used in cases of damages claims if they arise. Each image must be dated and a brief description note attached.

The Contractor shall:

1. Allow the ECOs access to take photographs of all areas, activities and actions.

The ECOs shall keep an electronic database of photographic records which will include:

1. Pictures of all areas designated as work areas, camp areas, development sites and storage areas taken before these areas are set up;
2. All bunding and fencing;
3. Road conditions and road verges;
4. Condition of all farm fences;
5. Topsoil storage areas;
6. All areas to be cordoned off during construction;
7. Waste management sites;
8. Ablution facilities (inside and out);
9. Any non-conformances deemed to be "significant";
10. All completed corrective actions for non-compliances;
11. All required signage;
12. Photographic recordings of incidents;
13. All areas before, during and post rehabilitation; and
14. Include relevant photographs in the Final Environmental Audit Report.

6.10 Complaints register

The ECOs shall keep a current and up-to-date complaints register. The complaints register is to be a record of all complaints received from communities, stakeholders and individuals. The Complaints Record shall:

1. Record the name and contact details of the complainant;
2. Record the time and date of the complaint;
3. Contain a detailed description of the complaint;
4. Where relevant and appropriate, contain photographic evidence of the complaint or damage (ECOs to take relevant photographs); and
5. Contain a copy of the ECOs written response to each complaint received and keep a record of any further correspondence with the complainant. The ECO's written response will include a description of any corrective action to be taken and must be signed by the Contractor, ECO and affected party. Where a damage claim is issued by the complainant, the ECOs shall respond as described in (section 5.3).

6.11 Claims for damages

In the event that a Claim for Damages is submitted by a community, landowner or individual, the ECOs shall:

1. Record the full detail of the complaint as described in (section 5.10) above;
2. The DPM will evaluate the claim and associated damage and submit the evaluation to the Senior Site Representative for approval;
3. Following consideration by the DPM, the claim is to be resolved and settled immediately, or the reason for not accepting the claim communicated in writing to the claimant. Should the claimant not accept this, the ECO shall, in writing report the incident to the Developer's negotiator and legal department; and
4. A formal record of the response by the ECOs to the claimant as well as the rectification of the method of making payments not amount will be recorded in the EMPr file.

6.12 Interactions with affected parties

Open, transparent and good relations with affected landowners, communities and regional staff are an essential aspect to the successful management and mitigation of environmental impacts.

The ECOs shall:

1. Ensure that all queries, complaints and claims are dealt within an agreed timeframe;
2. Ensure that any or all agreements are documented, signed by all parties and a record of the agreement kept in the EMPr file;
3. Ensure that a complaints telephone numbers are made available to all landowners and affected parties; and
4. Ensure that contact with affected parties is courteous at all times;

6.13 Environmental audits

Internal environmental audits of the activity and implementation of the EMPr must be undertaken. The findings and outcomes must be included in the EMPr file and be submitted to the CA at intervals as indicated in the EA.

An Environmental Audit Report must be prepared monthly. The report will be tabled as the key point on the agenda of the Environmental Site Meeting. The Report is submitted for acceptance at the meeting and the final report will be circulated to the Project Manager and filed in the EMPr file. At a frequency determined by the EA, the ECOs shall submit the monthly reports to the CA. At a minimum the monthly report is to cover the following:

- Weekly Environmental Checklists;

- Deviations and non-compliances with the checklists;
- Non-compliances issued;
- Completed and reported corrective actions;
- Environmental Monitoring;
- General environmental findings and actions; and
- Minutes of the Bi-monthly Environmental Site Meetings.

6.14 Final environmental audits

On final completion of the rehabilitation and/or requirements of the EA a final EIA Report is to be prepared and submitted to the CA. The EAR must comply with Appendix 7 of the EIA Regulations.

7. PHASES OF THE PROJECT

The point of departure for this EMPr is to take a pro-active route by addressing potential problems before they occur. This should limit corrective measures needed during the construction and operational phases of the development. Additional mitigation will be included throughout the project's various phases, as required and if necessary.

The EMPr deals with the following phases as detailed below:

7.1 The Planning and Design Phase (P)

Overall Goal for Planning and Design: Undertake the planning and design phase of the development in a way that:

- Ensures that the design of the plant responds to the identified environmental constraints and opportunities.
- Ensures that the best environmental options are selected for all components of the project.

The EMPr offers an ideal opportunity to incorporate pro-active environmental management measures with the goal of attaining sustainable development.

Pro-active environmental measures minimize the chance of impacts taking place during the construction and operational phase. There is still the chance of accidental impacts taking place; however, through the incorporation of contingency plans (e.g. this EMPr) during the planning phase, the necessary corrective action can be taken to further limit potential impacts. In order to meet this goal, actions plan for the planning and design phase have been identified together with monitoring requirements.

7.2 The Construction Phase (C)

The bulk of the impacts during this phase will have immediate effect (e.g. noise-, dust- and wetland pollution). If the site is monitored on a continual basis during the construction phase, it is possible to identify these impacts as they occur. These impacts will then be mitigated through the contingency plans identified in the planning phase, together with a commitment to sound environmental management from the developer.

7.3 Rehabilitation Phase (R)

Rehabilitation in this document refers to the reinstatement of the temporarily disturbed areas affected by the construction or due to construction related activities, to a state that resemble the conditions prior to the disturbances. It therefore does not address the rehabilitation of the wetlands at the proposed watercourse crossing from example a management category C to a B (Kleynhans, 1996 & Kleynhans, 1999). In order to improve the management category, the current impacts due to urbanisation and increased stormwater energy, erosion and pollution should be address and these fall outside the scope of this document.

This phase will involve restoring the land impacted during the construction phase back to its original state. This process will mainly on rectifying the negative impacts that have been caused during construction by the removing pollution or contaminants and other dangerous substances, removal of contaminating waste material, removal of alien plant species and improvement of the soil.

7.4 The Operational Phase (O)

By taking pro-active measures during the planning and construction phases, potential environmental impacts emanating during the operational phase will be minimised. This, in turn, will minimise the risk and reduce the monitoring effort, but it does not make monitoring obsolete.

8. ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

The following table forms the core of this EMPr for the construction and operational phases of the development. This table should be used as a checklist on site, especially during the construction phase. Compliance with this EMPr must be audited monthly during the construction phase and once immediately following completion of construction. This must be followed up with annual audits for a period of two years during the operational phase.

8.1 Table 3: **Planning and Design Phase**: Environmental Management Programme for the proposed project

Description of Management Aspect	Objective	Actions to be undertaken to Mitigate Environmental Impact Commitment / Actions Required / Key Controls	Monitoring Parameters	Frequency	Responsibility
P1: Planning	Notify all registered Interested and Affected Parties of Environmental Authorisation (EA)	Notify all registered I&APs and key stakeholders of the opportunity to appeal against the Authorisation	Proof of communication	To be checked through an Internal Audit once construction commences	Developer's Project Manager
	Ensure compliance with legal and other permitting requirements	• Several plants are provincially protected by the Northern Cape Nature Conservation Act No.9 of 2009. The removal or pruning of **these plants will require a permit** from the Northern Cape Department of Environment and Nature Conservation. At the time of this assessment, only *Ammocharis carinica* and *Aloe grandidentata* were recorded. It is likely that a denser grass layer obscured the small *Orbea lutea* and it is highly likely to still be present on the larger Secondary PAOI. All three these plant species can easily be transplanted and relocated to suitable habitat outside the development footprint on the site. • A **Water Use License** is required from the Department of Water and Sanitation (DWS)for the development as per the following specific water uses i.e. Section 21 C & I	Relevant documentation to be kept on record	To be checked through an Internal Audit once construction commences	Developer, PMC and Botanist
P3: Layout Design	Ensure the facility design responds to identified environmental constraints and opportunities	• Adherence to the 500m buffer as a minimum • A comprehensive **stormwater management plan** must be compiled that details how storm-water will be managed to reduce velocities and volumes of water that could lead to erosion of surfaces. Development of an integrated management plan for storm water and sewage management with key stakeholders • The **construction of a fence to secure Kamfers Dam** and its	Approved site plan	Prior to start of the works	Developer's Project Manager

Description of Management Aspect	Objective	Actions to be undertaken to Mitigate Environmental Impact Commitment / Actions Required / Key Controls	Monitoring Parameters	Monitoring Frequency	Monitoring Responsibility
		resident species from hunting, poaching and egg removal; • Submit **a final layout to competent authority prior to the commencement** of construction. This layout should provide information on all components of the project.			
P4: Site Establishment development	Impacts on the environment are minimised during site establishment and the development footprint are kept to demarcated development area.	• A **method statement** must be provided by the contractor prior to any onsite activity that includes the layout of the construction camp in the form of a plan showing the location of key infrastructure and services (where applicable), including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous materials storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management; • Location of camps must be within approved area to ensure that the site does not impact on sensitive areas identified in the environmental assessment or site walk through; • Sites must be located where possible on previously disturbed areas; • The camp must be fenced • The use of existing accommodation for contractor staff, where possible, is encouraged.	Method Statements in Environmental File Photographs	Once off for Continuous	ECO, dEO, cEO
	Minimise the destruction of natural vegetation on **the development site**	• Ensure that the ROD makes provision for the removal of provincially protected plants. • Ideally these plants, where removed, must be housed in a nursery facility, and used to rehabilitate disturbed areas. A local nurseryman / botanist should advise. • No development should take place within natural wetlands and	Unfocalized alteration of soil surface characteristics and loss of flora No fragmentation	Once off for Continuous	ECO, dEO, cEO

Description of Management Aspect	Objective	Actions to be undertaken to Mitigate Environmental Impact Commitment / Actions Required / Key Controls	Monitoring Parameters	Monitoring Frequency	Monitoring Responsibility
		wetland buffers.	of remaining vegetation		
	Limit Impact on Avifauna	• It is recommended that development within the 1000m buffer subject to the establishment of a partnership between the applicant and the custodians of Kamfers Dam and its primary stakeholders and the drafting of an integrated management plan to ensure the appropriate management of the residential estate and the greater PAOI in terms of: o the establishment and ongoing maintenance of appropriate and effective sewage, storm water and waste management strategies, o the construction of a fence to secure Kamfers Dam and its resident species from hunting, poaching and egg removal o policies to address and mitigate noise and light pollution and the keeping of pets; • Conduct a pre-construction inspection (avifaunal walk-through) of the final residential development layout, to identify any species that may be breeding on the authorised development site or within the immediate surrounds to ensure that any impacts likely to affect breeding species (if any) are adequately managed.	Reduce bird mortality	Once off for Continuous	ECO, dEO, cEO

Description of Management Aspect	Objective	Actions to be undertaken to Mitigate Environmental Impact Commitment / Actions Required / Key Controls	Monitoring Parameters	Monitoring Frequency	Monitoring Responsibility
	• Access to restricted areas prevented. • Minimise impact to the environment through the planned and restricted movement of vehicles on site.	• Identification of access restricted areas is to be informed by the environmental assessment, site walk through and any additional areas identified during development; • Erect, demarcate and maintain a temporary barrier with clear signage around the perimeter of any access restricted area, colour coding could be used if appropriate; and • Unauthorised access and development related activity inside access restricted areas is prohibited.	No-go signage Photographs	Once off for Continuous	ECO, dEO, cEO
P5: Environmental awareness training	All onsite staff are aware and understands the individual responsibilities in terms of this EMPr.	• All staff must receive environmental awareness training prior to commencement of the activities; • The Contractor must allow for sufficient sessions to train all personnel with no more than 20 personnel attending each course; • Refresher environmental awareness training is available as and when required; • All staff are aware of the conditions and controls linked to the EA and within the EMPr and made aware of their individual roles and responsibilities in achieving compliance with the EA and EMPr; • The Contractor must erect and maintain information posters at key locations on site, and the posters must include the following information as a minimum: a) Safety notifications; and b) No littering. • Environmental awareness training must include as a minimum the following: a) Description of significant environmental impacts, actual or potential, related to their work activities; b) Mitigation measures to be implemented when carrying out specific activities;	• Copy of signed EMPr to be available on site • Photographs • Attendance registers • Environmental File	Prior to construction and continuously	Contractor, ECO, dEO, cEO

Description of Management Aspect	Objective	Actions to be undertaken to Mitigate Environmental Impact Commitment / Actions Required / Key Controls	Monitoring Parameters	Monitoring Frequency	Monitoring Responsibility
		c) Emergency preparedness and response procedures; d) Emergency procedures; e) Procedures to be followed when working near or within sensitive areas; f) Wastewater management procedures; g) Water usage and conservation; h) Solid waste management procedures; i) Sanitation procedures; j) Fire prevention; and k) Disease prevention. • A record of all environmental awareness training courses undertaken as part of the EMPr must be available; • Educate workers on the dangers of open and/or unattended fires; • A staff attendance registers of all staff to have received environmental awareness training must be available. • Course material must be available and presented in appropriate languages that all staff can understand.			
P6: Grievances	To ensure effective communication mechanisms with landowners and other interested and affected parties	• Develop grievance mechanisms for the recording and management of complaints and grievances specifically including (but not limited to) grievances from those living in the area. • Liaison with landowner is to be undertaken prior to the commencement of construction in order to provide sufficient time for him to plan agricultural activities.	Effective communication procedures in place.	Pre-construction (construction procedure) Pre-operation (operation procedure)	Developer's Project Manager

8.2 Table 4: Construction Phase: Environmental Management Programme for the proposed project

Description of Management Aspect	Objective	Actions to be undertaken to Mitigate Environmental Impact	Monitoring		
		Commitment / Actions Required / Key Controls	Parameters	Frequency	Responsibility
C1: Fencing and Gate installation	Minimise health and safety risks to onsite personnel and the public.	• Use existing gates provided to gain access to all parts of the area authorised for development, where possible; • All gates must be fitted with locks and be kept locked at all times during the development phase, unless otherwise agreed with the landowner; • Fencing must be erected around the camp, batching plants, hazardous storage areas, and all designated access restricted areas, where appropriate and would not cause harm to the sensitive flora; • Any temporary fencing to restrict the movement of life-stock must only be erected with the permission of the land owner. • All fencing must be developed of high-quality material bearing the SABS mark; • The use of razor wire as fencing must be avoided; • Fenced areas with gate access must remain locked after hours, during weekends and on holidays if staff is away from site. Site security will be required at all times;	Controlled access points Photographs	Once-off	Contractor, ECO, dEO, cEO
C2: Vegetation Clearing	Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.	• An independent Ecological Control Officer (ECO) should be appointed to oversee construction. • Category 1b invasive species should be removed from the site prior to earthworks. This will limit the spread of such species downstream and into disturbed soils. • Keep the development footprint, including site camps, as small as possible • A temporary fence or demarcation must be erected around the construction area (include the actual footprint, as well as areas where material is stored and needed for e.g. trenching) to prevent access to adjacent vegetation. • Prohibit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the construction area. • No open fires are permitted within naturally vegetated areas. • Formalise access roads and make use of existing roads and tracks where feasible, rather than creating new routes through naturally vegetated areas. • Introduce adequate sedimentation control measures at watercourse crossings and when excavation or disturbance within moist grasslands takes place.	• No-go demarcations • Alien Invasive Management Plan	Throughout construction phase	Contractor, ECO, dEO, cEO

Description of Management Aspect	Objective	Actions to be undertaken to Mitigate Environmental Impact Commitment / Actions Required / Key Controls	Monitoring Parameters	Frequency	Responsibility
		• Limit clearing of indigenous vegetation to only the development footprint. • Where topsoils need to be removed, store such in a separate area where such soils can be protected until they can be re-used for post-construction rehabilitation • Never mix topsoils with subsoils or other spoil materials • Maintain site demarcations in position until the cessation of construction work. • An Eco should take note off all bulbous and succulent species unearthed and consult with the specialist / botanist for identification. Such species should be collected and used in the landscaping / rehabilitation of open spaces.			
C3: Alien and invasive vegetation management	Preventing the spread of alien invasive	• Alien invasive species, in particular category 1b species that were identified within the study area, should be removed from the development footprint and immediate surrounds, prior to construction or soil disturbances. By removing these species, the spread of seeds will be prevented into disturbed soils which could thus have a positive impact on the surrounding natural vegetation. • All alien seedlings and saplings must be removed as they become evident for the duration of construction. • All construction vehicles and equipment, as well as construction material should be free of plant material. Therefore, all equipment and vehicles should be thoroughly cleaned prior to access on to the construction areas. This should be verified by the ECO. • If filling material is to be used, this should be sourced from areas free of invasive species	• Less re-infestation or introduction of additional weeds during construction	Throughout construction phase	Contractor, ECO, dEO, cEO
C4: Protection of terrestrial fauna and Avifauna	Minimise disturbance to terrestrial fauna and Avifauna	• Adherence to the 500m buffer as a minimum • No development within Area 4 • Construction activity should be restricted to the immediate footprint of the infrastructure. Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species • All temporary disturbed areas should be rehabilitated according to the site's rehabilitation plan, following construction. • Construction of appropriate sewage and storm water management infrastructure	• No-go demarcations • Monitor list of faunal species identified on site	Throughout construction phase	Contractor, ECO, dEO, cEO

Description of Management Aspect	Objective	Actions to be undertaken to Mitigate Environmental Impact Commitment / Actions Required / Key Controls	Monitoring Parameters	Frequency	Responsibility
		• Disturbance by residents of birds breeding and foraging in the area must be minimized and controlled. • Any bird nests that are found during the construction period must be reported to the Environmental Control Officer (ECO). • Construction activities should occur outside of the Lesser Flamingos breeding season.			
C5: Protection water of resources	Ensuring that pollution and contamination of the watercourse environment are prevented.	• Ensure that no unnecessary vegetation is removed during the construction phase, • Avoid unnecessary aquatic ecosystem crossing - limit work within the stream, river or wetland. The use of single access points for crossings. • Other than approved and authorized structure, no other development or maintenance infrastructure is allowed within the delineated watercourse or its associated buffer zones. • Mark all areas which don't form part of the proposed development within the watercourse as no-go areas. • Weed control in aquatic ecosystem and buffer zone. • Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance of the proposed infrastructure and take immediate corrective action where invasive species are observed to establish.	Spill record list No-go demarcations	Throughout construction phase	Contractor, ECO, dEO, cEO
C6: Storm and waste water management	Impacts to the environment caused by storm water and wastewater discharges during construction are avoided.	• Stormwater attenuation on site should accommodate more than 50% of storm event to protect the Kamfers dam from further inundation. • Predictions of stormwater flows should take into consideration expected climate change related catchment changes. • Effective control of stormwater from access roads should be undertaken • Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas. •	Run off monitoring records Spill record list	Throughout Construction	Contractor, ECO, dEO, cEO
C7: Protection of heritage resources	• Limit the destruction on heritage resources • Minimise impact to heritage resources.	• Should any archaeological artefacts be exposed during excavation, work on the area where the artefacts were found, shall cease immediately and the ECO shall be notified as soon as possible.	No-go demarcations Monitor site and	Throughout construction phase	Contractor, ECO, dEO, cEO

Description of Management Aspect	Objective	Actions to be undertaken to Mitigate Environmental Impact Commitment / Actions Required / Key Controls	Monitoring Parameters	Frequency	Responsibility
		• Upon receipt of such notification, the ECO will arrange for the excavation to be examined by an Archaeologist as soon as possible • Under no circumstances shall archaeological artefacts be removed, destroyed or interfered • Any archaeological sites exposed during construction activities may not be disturbed prior to authorisation by the South African Heritage Resources Agency.	excavations – photographs		
C8: Solid and hazardous waste management	• Minimize the generation of solid and liquid waste, including hazardous waste, which may contaminate the receiving environment (soil, groundwater, sensitive habitats) and adjacent properties. • Limit the potential for site pollution and the accumulation of refuse materials on site.	• Litter generated by construction workers must be collected in containers that are clearly labelled, and disposed of weekly at registered waste disposal sites. • Sufficient weather- and vermin- proof bins should be placed on site for the disposal of solid waste. Littering on site should be strictly prohibited. The burning of waste on site should also be prohibited. • All waste generated from construction activities (building rubble, solid and liquid waste etc.), should be disposed of as frequently at an appropriately licensed refuse facility. • Minimize waste generation, e.g. by providing re-usable items and refillable containers (e.g. for drinking water) and adopt a 'cradle to grave' responsibility for wastes. • Comply with legal requirements for waste management and pollution control and employ "good housekeeping" and monitoring practices.	Waste disposal manifest documentation from waste removal contractor. Visual inspection.	Throughout construction phase	Contractor, ECO, dEO, cEO
C9: Aesthetic / visual impacts	Minimise changing view over the site and sense of place	• Avoid constructing a new tower by co-locating the telecommunication radio infrastructure on an existing tower thereby significantly reducing the risk sources and associated impacts. • Minimise the disturbance footprint by clearly marking the working area and thereby limiting construction activities within a dedicated area. • Locate the lay-down area and construction camp in an area that is already disturbed, for example in the forested areas on the foot slopes of the mountain. • Erect a 2-3m high, temporary screen around the construction site with a material that simulates the vegetation's colour and texture, for example camouflage netting, to restrict visibility. • Keep the construction site neat and clean. Dispose all waste material in suitably closed containers and remove off site at	Visual inspection	Throughout construction phase	Contractor, ECO, dEO, cEO

Description of Management Aspect	Objective	Actions to be undertaken to Mitigate Environmental Impact Commitment / Actions Required / Key Controls	Monitoring Parameters	Frequency	Responsibility
		regular intervals. • Rehabilitate the disturbed area as soon as possible to minimise the impact of exposed soil and re-establish a vegetation cover.			
C10: Workshop, equipment maintenance and storage	Soil, surface water and groundwater contamination is minimised.	• Where possible and practical all maintenance of vehicles and equipment must take place in the workshop area; • During servicing of vehicles or equipment, especially where emergency repairs are affected outside the workshop area, a suitable drip tray must be used to prevent spills onto the soil. The relevant local authority must be made aware of a fire as soon as it starts; • Leaking equipment must be repaired immediately or be removed from site to facilitate repair; • Workshop areas must be monitored for oil and fuel spills; • Appropriately sized spill kit kept onsite relevant to the scale of the activity taking place must be available; • The workshop area must have a bunded concrete slab that is sloped to facilitate runoff into a collection sump or suitable oil / water separator where maintenance work on vehicles and equipment can be performed; • Water drainage from the workshop must be contained and managed in accordance to the Section on storm and waste water management.	Demarcated area Spill kits and drip trays	Throughout construction phase	Contractor, ECO, dEO, cEO
C11: Batching plants	Minimise spillages and contamination of soil, surface water and groundwater.	• Concrete mixing must be carried out on an impermeable surface; • Batching plants areas must be fitted with a containment facility for the collection of cement laden water. • Dirty water from the batching plant must be contained to prevent soil and groundwater contamination Bagged cement must be stored in an appropriate facility and at least 10 m away from any water courses, gullies and drains; • A washout facility must be provided for washing of concrete	Demarcated area Spill kits and drip trays Separate bin for cement bags Fencing	Throughout construction phase	Contractor, ECO, dEO, cEO

Description of Management Aspect	Objective	Actions to be undertaken to Mitigate Environmental Impact Commitment / Actions Required / Key Controls	Monitoring Parameters	Frequency	Responsibility
		associated equipment. Water used for washing must be restricted; • Hardened concrete from the washout facility or concrete mixer can either be reused or disposed of at an appropriate licenced disposal facility; • Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site; • Sand and aggregates containing cement must be kept damp to prevent the generation of dust (Refer to Section 5.20: Dust emissions) • Any excess sand, stone and cement must be removed or reused from site on completion of construction period and disposed at a registered disposal facility; • Temporary fencing must be erected around batching plants in accordance with the Section in Fencing and gate installation.			
C12: Dust emissions	Dust prevention measures are applied to minimise the generation of dust.	• Take all reasonable measures to minimise the generation of dust as a result of project development activities to the satisfaction of the ECO; • Removal of vegetation must be avoided until such time as soil stripping is required and similarly exposed surfaces must be re-vegetated or stabilised as soon as is practically possible; • Excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present; • During high wind conditions, the ECO must evaluate the situation and make recommendations as to whether dust-damping measures are adequate, or whether working will cease altogether until the wind speed drops to an acceptable level; • Where possible, soil stockpiles must be located in sheltered areas where they are not exposed to the erosive effects of the wind; • Where erosion of stockpiles becomes a problem, erosion control measures must be implemented at the discretion of the ECO; • Vehicle speeds must not exceed 40 km/h along dust roads or 20 km/h when traversing unconsolidated and non-vegetated areas; • Straw stabilisation must be applied at a rate of one bale/10 m² and harrowed into the top 100 mm of top material, for all	Damp areas – photographs	Throughout construction phase	Contractor, ECO, dEO, cEO

Description of Management Aspect	Objective	Actions to be undertaken to Mitigate Environmental Impact Commitment / Actions Required / Key Controls	Monitoring Parameters	Frequency	Responsibility
		completed earthworks; • For significant areas of excavation or exposed ground, dust suppression measures must be used to minimise the spread of dust.			
C13: Noise / light Pollution	Manage any potential noise impacts and Minimize visual impacts associated with construction activities.	• Any blasting activity must be conducted by a suitably licensed blasting contractor; and • Notification of surrounding landowners, emergency services site personnel of blasting activity 24 hours prior to such activity taking place on Site. • The Contractor must keep noise level within acceptable limits, Restrict the use of sound amplification equipment for communication and emergency only; • All vehicles and machinery must be fitted with appropriate silencing technology and must be properly maintained; • Any complaints received by the Contractor regarding noise must be recorded and communicated. Where possible or applicable, provide transport to and from the site on a daily basis for construction workers; • Develop a Code of Conduct for the construction phase in terms of behaviour of construction staff. Operating hours as determined by the environmental authorisation are adhered to during the development phase. Where not defined, it must be ensured that development activities must still meet the impact management outcome related to noise management. • The phasing programme will be arranged to control the amount of disturbance in noise and vibration sensitive areas at times that are considered of greatest sensitivity. • During excavation or when other high noise generating works are in progress on a site at the same time as other works of construction that themselves may generate significant noise and vibration, the working programme will be phased to prevent unacceptable disturbance at any time.	Construction occurring during working hours	On-going	Contractor, ECO, dEO, cEO
C14: Stockpiling and stockpile areas	Limit Erosion as a result of stockpiling are reduced.	• All material that is excavated during the project development phase (either during piling (if required) or earthworks) must be stored appropriately on site in order to minimise impacts to watercourses, watercourses and water bodies; • All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular	Damp stockpiles Stockpiles must be barriered photographs	On-going	Contractor, ECO, dEO, cEO

Description of Management Aspect	Objective	Actions to be undertaken to Mitigate Environmental Impact Commitment / Actions Required / Key Controls	Monitoring Parameters	Frequency	Responsibility
		weeding and control methods; • Topsoil stockpiles must not exceed 2 m in height; • During periods of strong winds and heavy rain, the stockpiles must be covered with appropriate material (e.g. cloth, tarpaulin etc.); • Where possible, sandbags (or similar) must be placed at the bases of the stockpiled material in order to prevent erosion of the material.			
C15: Traffic Impacts	Monitor and Manage any potential traffic congestion.	• Arrange for deliveries to be made during off peak hours. • Have strict adherence to working hours. • Limiting the number of vehicles entering and exiting the construction site will ensure that traffic is kept to what is needed for construction and monitoring purposes. • Place traffic signals on local roads surrounding the development during the construction phase in conjunction with local traffic authorities. • Have suitable equipment and personnel available to rapidly deal with traffic incidents. • Appropriate dust suppression techniques must be implemented to minimise dust from gravel roads. • All relevant permits for abnormal loads must be applied for from the relevant authority.	• Construction vehicles keeping to the speed limits within the site and on public roads. • No construction traffic related accidents are experienced. • Complaints of residents are not received (e.g. concerning the speeding of heavy vehicles).	On-going	Contractor, ECO, dEO, cEO
C16: Socio-economic	Maximise local employment and business opportunities associated with the construction phase	• Develop and implement communication strategies to facilitate public participation; • Develop and implement a collaborative and constructive approach to conflict resolution as part of the external stakeholder engagement process; • Where possible, first preference should be given to locals for job opportunities that will be created through the project. • Identify potential opportunities for local businesses. • Where required, implement appropriate training and skills development programmes prior to the initiation of the	Proof of Stakeholder Engagement to be kept in file Local Employment and Supplies	On-going	Contractor, dEO, cEO

Description of Management Aspect	Objective	Actions to be undertaken to Mitigate Environmental Impact Commitment / Actions Required / Key Controls	Monitoring Parameters	Frequency	Responsibility
		construction phase.			
C17: Compaction and destruction of soils	Limit compaction and destruction of soils	• Vehicles and machinery may not veer from the dedicated roads. • Once construction is complete, obsolete roads should be obliterated by breaking the surface crust and erecting earth embankments to prevent erosion, while the natural species composition should be re-established. • Prior to construction, the topsoil must be removed and stored separately from subsoil. The topsoil is imperative for the successful re-establishment of indigenous vegetation and it carries seed from the existing vegetation • Topsoil (the upper 25 cm of soil) is an important natural resource; where it must and can be stripped, never mix it with subsoil or any other material, store and protect it separately until it can be re-applied, minimise handling of topsoil. • Topsoil is typically stored in berms with a width of 150 – 200 cm, and a maximum height of 100 cm, preferably lower, ideally in a disturbed but weed-free area. Place berms along contours or perpendicular to the prevailing wind direction. • Rapid decomposition of organic material in warm, moist topsoils decreases microbial activity necessary for nutrient cycling, and reduces the number of beneficial micro-organisms in the soil. Therefore, topsoil should therefore not be stored for extensive periods and it is recommended that the reapplication of topsoil takes place as soon as possible. Adhere to the following general rule: the larger the pile of topsoil storage needs to be, the shorter should be the time it is stored • Topsoil handling should be limited to stripping, piling (once), and re-application. • Any movement of heavy machinery or vehicles over stored topsoils must be strictly prohibited.	No altered soil characteristics and vegetation that remain in an unstable, and no pioneer phase or invaded by alien invasive plant species.	On-going	Contractor, dEO, cEO
C18: Sedimentation	Prevent/limit sedimentation	• Increased run-off during construction must be managed using berms and other suitable structures as required to ensure flow velocities are reduced; this must be done in consultation with the ECO • The contractor shall ensure that excessive quantities of sand, silt and silt-laden water do not enter watercourses. Appropriate measures, e.g. erection of silt traps, or drainage retention areas	Well controlled runoff	On-going	Contractor, dEO, cEO

Description of Management Aspect	Objective	Actions to be undertaken to Mitigate Environmental Impact Commitment / Actions Required / Key Controls	Monitoring Parameters	Monitoring Frequency	Monitoring Responsibility
		to prevent silt and sand entering drainage or watercourses must be taken • Silt trenches between the works area and downstream watercourse could be used to trap any sediment washing off the works area and to prevent scouring of the stream-line in case of heavy flows. This will provide protection for the downstream section of the watercourse for almost the entire length of road across a riparian area • Where wetlands or riparian areas are adjacent to the construction areas and these areas slopes toward the river, install sediment barriers along the edge of the construction areas as necessary to prevent sediment flow into the river • Sediment barriers must be properly maintained throughout construction and reinstalled as necessary until replaced by permanent erosion controls or restoration of adjacent upland areas is complete • It is important that topsoil should be conserved in areas where bedrock is shallow to avoid sedimentation • Should water need to be pumped around the works area and discharged back into the river, care must be taken to ensure that the water is discharged in a manner that does not cause siltation or erosion downstream. As such it is recommended that any water to be discharged from pumping around the construction area or from dewatering operations be first discharged into a structure that allows the settlement of all suspended material, and which allows the diffuse discharge of water into the river. The water must be dissipated on re-entry into the watercourse, to reduce the changes of erosion			

8.3 Table 5: Rehabilitation Phase: Environmental Management Programme for the proposed project

Description of Management Aspects	Action	Time frame
Impact on stream morphology This impact is related to the cumulative catchment wide changes to the landscape.	• Reinstatement should proceed directly after closure of the trench • Slope reshaping must follow the natural slope and topography of the surrounding undisturbed area and wetland to the east of the artificial channel. • Areas for resloping must be ripped or loosened to a depth of 150mm to prepare soils for revegetation and allow water penetration into the soils. • Ripping must be done manually with hand tools. • No vehicles are permitted in the area to prevent further disturbance to watercourses. • Ripping must be done during the late dry season to prevent erosion and collapse of the banks. • To promote vegetation growth and establishment, the slope angle must be a maximum of 1(V):3(H). • In areas where this is not possible, or where further disturbance to the wetland will prove to be significant, a slope of no steeper than 1:2 should be achieved. • Construct any necessary erosion protection works based on empirical data • Construct attenuation structures based on hydrological requirements • watercourse sediments/debris are not to be used for construction (e.g.: rocks for use in gabion baskets/reno mattresses) or to be permanently removed from the system • Removed sediment should be stockpiled for rehabilitation • Do not allow excavations to stand open for longer than 2 days where at all possible. Excavations should preferably be opened and closed on the same day • During construction through a watercourse, the majority of the flow of the watercourse must be allowed to pass down the stream channel (i.e. damming must not be allowed to take place). In-stream diversions should be used rather than the construction of new channels	• After completion of construction • Where degradation is identified prior to construction • During construction - ongoing

Revegetation
Areas where vegetation will be impacted include the area directly impacted on by the construction of the structures, the temporary work area, and connecting roads. Areas where vegetation has been removed or destroyed should be kept to a minimum. Disturbance of slopes, for example by the removal of vegetation, may result in slope instability and erosion by rain and surface runoff.
	• Stripping of vegetation for construction must occur in a phased manner and must be restricted to the excavation footprint to reduce the risk of erosion during times of precipitation
	• Where soils are removed, the topsoil and subsoil must be stockpiled separately in low heaps (Topsoil are deemed to be the top layer of soil containing organic material, nutrients and plant grass seed. For this reason it is an extremely valuable resource for the rehabilitation and vegetation of disturbed areas)
	• After construction, compacted areas should be ripped and topsoil replaced from the areas where it was removed. Areas within the construction footprint can be re-vegetated using the sods that were removed prior to construction. The sods should be placed level, or slightly deeper than surrounding vegetation, on ripped soils. Against slopes, the sods should be pegged to ensure that it does not wash away before the roots establish
	• A suitable grass mixture must be spread by hand along the extent of the slopes. Species applicable for revegetation in this area include amongst others:
	  • *Digitaria eriantha*`
	  • *Eragrotis curvula*
	  • *Imperata cylindric*
	  • *Panicum maximum a*
		• Immediately after construction
		• Where degradation is identified prior to construction
		• At any time during operational phase, when maintenance activities might have destroyed natural vegetation
		• As and when monitoring indicates degradation of vegetation

Description of Management Aspects	Action	Time frame
	• Seeds must be thorough mixed before applying. • The seeds must be applied according to the required rates. • Application rates can be increased in areas that are unfavourable or steep, but no more than double the recommendations. • Seeds can be mixed with a spreading agent such as river sand, bran or finely sifted kraal to ensure even distribution. • Manure or agricultural lime and granular fertiliser mix can be applied prior to reseeding. • Once complete, the seeded area must be watered and patted down gently. • Indigenous vegetation removed from the area must be applied over the seeded area as mulch. • Badly damaged areas should be fenced in to allow for rehabilitation to take place without further impacts on these areas • All rehabilitated areas must be monitored for the presence of exotic and alien plant species during rehabilitation • All disturbed areas will require rehabilitation must be mulched to encourage vegetation re-growth. Mulch used must be free from alien seed. These areas must be cordoned off so that vehicles or construction personnel cannot gain access to these areas • Where possible, cut vegetation to ground-level rather than removing completely, leaving root systems to ensure rapid re-colonisation	
Slope stabilization This action is required to ensure the success of revegetation and should be applied throughout the rehabilitation area	• The slopes must be covered by jute or hessian geotextiles (soilsaver or GeoJute). • GeoJute by Geotextiles Africa is available in rolls of 2.4m x 50m. The mesh is approximately 10mm x 10mm and is manufactured from woven jute fibre to form a mesh through which seedlings can growth. • GeoJute is biodegradable over 2 years. • The GeoJute must be placed vertically on the slopes and overlap at the edges. It can be fastened with wooden stakes every 1m	• Directly after revegetation.
Soil disturbance Disturbance to soils and alteration of geomorphology.	• Stockpiled wetland soil should be demarcated, kept free of weeds and is not to be compacted or used for construction • Wetland soils are to be handled twice only, firstly to strip and stockpile, and secondly to replace, level, shape and reinstate wetland vegetation • No activities are allowed outside of the demarked works area • No activities should take place in moist soils or at least 2 days after heavy rainfall	• During construction - ongoing
Soil Compaction Soil compaction is likely to occur on access roads, and temporary work platforms where heavy vehicles and personnel move around. Soil compaction will decrease permeability of the soil, negatively impact the sub-surface flows and compromise vegetation establishment.	• Areas where soil has been compacted should be ripped to encourage vegetation growth • Do not rip and / or scarify areas under wet conditions, as the soil will not break up and compaction will be worsened • Do not permit vehicular or pedestrian access into natural areas or into seasonally wet areas during and immediately after rainy periods, until such a time that the soil has dried out • Rip and / or scarify all disturbed (and other specified) areas of the construction site, including temporary access routes and roads, compacted during the execution of the Works.	• Immediately after construction • As and when monitoring indicates severe compaction due to maintenance
Mobilisation of pollutants	• Ensure the maintenance of litter traps	• During construction – ongoing

Description of Management Aspects	Action	Time frame
The mobilisation of sediments, excavations, removal and disturbances to vegetation, mobilisation of pollutants could have various negative impacts on watercourses and their associated functionality.	• Remove all project-related material used to support equipment on completion of construction • Any contaminated soil from the construction site needs to be removed and properly disposed of • Implement preventative maintenance system to ensure that work vehicles are maintained in an acceptable condition. This would involve routinely checking vehicles for leaks before construction begins; and not allowing vehicles/equipment with significant leaks to operate or be repaired within the construction site. • Materials such as fuel, oil and paint must be sealed and stored in bermed areas or under lock and key, as appropriate, in well-ventilated areas • These substances must be confined to specific and secured areas within the contractor's camp, and in a way that does not pose a danger of pollution even during times of high rainfall • Storage of materials as described above may not be within the 1:100 floodline, watercourses or associated buffer areas • In the case of pollution of any surface or groundwater, the Regional Representative of the Department of Water and Sanitation (DWS) must be informed immediately • All equipment should be parked overnight and/or fuelled at least 500 meters from a watercourse • Drip trays (minimum of 10cm deep) must be placed under all vehicles that stand for more than 24 hours. Vehicles suspected of leaking must not be left unattended, drip trays must be utilised. • Drip trays must be utilised during repairs and maintenance of all machinery. The depth of the drip tray must be determined considering the total amount / volume of oil in the vehicle. The drip tray must be able to contain the volume of oil in the vehicle • Provision of adequate sanitation facilities located outside of the watercourse or its associated buffer zone • Any water discharged must comply with the relevant Water Quality limits/guidelines specified by DWS.	• Immediately after construction • At any time during operational phase when maintenance activities might have resulted in pollution
Spread of Alien Invasive Species	• Appointment of alien plant working group / assign this duty to specific staff • Alien invasive species that were identified should be removed prior to construction related soil disturbances. This will prevent seed spreading into disturbed soils or to downstream areas • All alien seedlings and saplings must be removed as they become evident for the duration of construction • Manual / mechanical removal is preferred to chemical control • If herbicide must be used it should be registered for aquatic use • Acquire the necessary equipment for removal and control • Planned sequence of areas to be cleared of invasive plants • A register of the methods used, dates undertaken, as well as herbicides and dosage used must be kept and available on site. The register must also include incidents of poisoning or spillage • Ensure that contractors can identify the relevant plants and are aware of the removal procedures • All construction vehicles and equipment, as well as construction material should be free of plant material. Equipment and vehicles should be thoroughly cleaned other prior to access on to the construction site.	• During and after construction • As soon as monitoring recorded alien invasive species

Description of Management Aspects	Action	Time frame
Erosion Erosion and sedimentation is likely to occur where vegetation has been cleared and where excavated material is stored in close proximity to a watercourse. Disturbance of steep slopes by the removal of vegetation may result in slope instability and erosion by rain and surface run-off.	• The contractor shall be responsible for rehabilitating all eroded areas in such a way that the erosion potential is limited after construction has been completed • All slopes that are disturbed during construction should be stabilised immediately to prevent erosion • Re-vegetation should be done immediately after construction, especially in sloped areas • Disturbances on site should be kept to a minimum to reduce the loss of material by erosion • Disturbed areas that require rehabilitation should be mulched to encourage vegetation re-growth • Stockpiled soil should be protected from erosion due to water runoff • Near vertical slopes of 1(V):1(H) or 1(V):2(H) must be stabilised using hard structures, preferably with a natural look, and with facilities allowing for plant growth. The EO / ECO will specify a solution in terms of the most appropriate approved method and technology. One or more of the following methods may be required: o Retaining walls (loffel or otherwise) o Stone pitching. o Gabions. o Shotcrete. • Protect the slopes of all stream diversions. One or more of the following methods may be used, as specified by the EO / ECO: o Sandbags. o Reno mattresses. o Plastic liners and / or coarse rock (undersize rip-rap) • Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within work areas • Where all preventative measures have failed and erosion persists soft and hard rehabilitation options, such as eco-logs or weirs, should be considered in conjunction with an engineer and wetland specialist • Erosion control of all banks must take place to reduce erosion and sedimentation into river channels or wetland areas. • Any erosion gullies/channels created during construction should be filled to ensure silt does not drain into the wetland • Spoil from the construction zone should not be placed within the watercourse • Bare ground exposed after vegetation removal must be rehabilitated as soon as possible	• During and immediately after construction • As and when monitoring indicate erosion is taking place
Sedimentation	• Sedimentation should be prevented though sufficient mitigation • If structures are used on sensitive sloped areas it is important that sediment does not pass through these structures e.g. gabions should be lined • Should sedimentation be observed to accumulate and smother vegetation, a wetland specialist should be consulted to find a suitable solution for the specific watercourse and its species composition • Water discharged into the environment must be done so in a manner that is not conducive to erosion and does not result in heavily silt-laden water flowing into any watercourse. • Bare ground exposed after vegetation removal must be rehabilitated as soon as possible.	• During and after construction • As soon as monitoring records sedimentation

8.4 Table 6: Operational Phase: Environmental Management Programme for the proposed project

Description of Management Aspect	Objective	Actions to be undertaken to Mitigate Environmental Impact Commitment / Actions Required / Key Controls	Monitoring Parameters	Monitoring Frequency	Monitoring Responsibility
O1: Protection of indigenous natural vegetation, fauna and maintenance of rehabilitation	• Maintain minimised footprints of disturbance of vegetation • Ensure and encourage plant regrowth in non-operational areas of post-construction rehabilitation.	• After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction. • Areas that will remain open space should be rehabilitated / landscape using indigenous species naturally occurring in the Kimberley thornveld. Do not use artificial fertilizers as it could have an impact on the water quality in the Kamfers Dam. • No operational activities may impact negatively on remaining natural vegetation within wetlands. • Maintenance workers may not trample natural vegetation and work should be restricted to previously disturbed footprint. In addition, mitigation measures as set out for the construction phase should be adhered to.	No further disturbance to vegetation Continued improvement of rehabilitation efforts. Gradual disappearance of all alien plant species on site.	Throughout operations	Developer Project Manager
	Protection of Fauna & Avifauna	• Develop an integrated management plan for storm water and sewage management with key stakeholders. Measures to rapidly deal with spills or floods must be put in place before construction commences. • No stormwater, pollutants, sewerage or other waste must pollute the area or enter Kamfers Dam during the construction or operational phases. • Storm water and sewer reticulation must make use of a bulk outfall system and must be transported away from Kamfers Dam - the development must not make use of the storm water and sewage systems at Kamfers Dam which are currently unable to process the current storm water and sewage yields. • Construction of appropriate sewage and storm water management infrastructure • Ongoing maintenance of the sewage and storm water management infrastructure • A management and monitoring system must be implemented to carefully monitor the water quality and water levels of the Kamfers Dam to benefit the ecological and habitat requirements of the waterbirds, in particular Lesser Flamingo.	No further disturbance to vegetation or terrestrial faunal habitats Continued improvement of rehabilitation efforts. Gradual disappearance of all alien plant species on site.	Throughout operations	Developer Project Manager
O2: Manage and reduce the impact of invasive vegetation	• To avoid the introduction of additional alien invasive plants to the	• Compile a detailed invasive plant management and monitoring programme as guideline for the entire construction, operational and decommissioning phase. This plan must contain WfW-accepted species- specific eradication methods. It must also	Visible reduction of number and cover of alien invasive plants	Throughout operations	Developer Project Manager

Description of Management Aspect	Objective	Actions to be undertaken to Mitigate Environmental Impact Commitment / Actions Required / Key Controls	Monitoring Parameters	Monitoring Frequency	Monitoring Responsibility
	project control area. • To avoid further distribution and thickening of existing alien plants on the project area. • To complement existing alien plant eradication programs in gradually causing a significant reduction of alien plant species throughout the project control area.	provide for a continuous monitoring programme to detect new infestations • Avoid creating conditions in which invasive plants may become established: o Keep disturbance of indigenous vegetation to a minimum o Rehabilitate disturbed areas as quickly as possible o Shred all non-seeding material from cleared invasive shrubs and other vegetation an use as mulch as part of the rehabilitation and revegetation plan o Do not import soil from areas with alien plants o Eradicate all invasive plants that occur within the development's temporary and permanent footprint areas o Ensure that material from invasive plants that can regenerate – seeds, suckers, plant parts are adequately destroyed and not further distributed o Immediately control any alien plants that become newly established using registered control measures	within the project area. Improvement of vegetation cover from current dominance of invasive shrubs to dominance of perennial grasses and dwarf shrubs No establishment of additional alien invasive species.		
O3: Fire prevention	Ensure the implementation of an appropriate fire management plan during the operation phase	• Designate smoking areas where the fire hazard could be regarded as insignificant; • Firefighting equipment must be available on all vehicles located on site; • The local Fire Protection Agency (FPA) must be informed of construction activities; • Contact numbers for the FPA and emergency services must be communicated in environmental awareness training and displayed at a central location on site; • Ensure that appropriate communication channels are established to be implemented in the event of a fire. • Fire breaks should be established where and when required. Cognisance must be taken of the relevant legislation when planning and burning firebreaks (in terms of timing). • Upon completion of the construction phase, an emergency evacuation plan must be drawn up to ensure the safety of the staff and surrounding land users in the case of an emergency. • Contact details of emergency services should be prominently displayed on site.	Designated smoking areas Emergency details to be kept on file Fire-fighting equipment and appropriate training provided before the operational phase commences. Appropriate fire breaks in place and maintained	Throughout operations	Developer Project Manager

Description of Management Aspect	Objective	Actions to be undertaken to Mitigate Environmental Impact Commitment / Actions Required / Key Controls	Monitoring Parameters	Frequency	Responsibility
O4: Maximise local employment and business opportunities associated with the operational phase	In the medium to long term employ as many locals as possible to fill the full-time employment opportunities.	• The workforce staff is likely to be based in the region. The developer should commit to implementing a training and skills development and training programme to maximise employment for locals. • Identify local members of the community who are suitably qualified or who have the potential to be employed full time.	Developer's equity policy Certificates	Prior to commencement of operation	Developer Project Manager
O5: Appropriate handling and management of waste	• Comply with waste management legislation. • Minimise production of waste. • Ensure appropriate waste disposal. • Avoid environmental harm from waste disposal. • Ensure appropriate storage of chemicals and hazardous substances.	• Hazardous substances (such as used/new transformer oils) must be stored in sealed containers within a clearly demarcated designated area. • Storage areas for hazardous substances must be appropriately sealed and bunded. • All structures and/or components replaced during maintenance activities must be appropriately disposed of at an appropriately licensed waste disposal site or sold to a recycling merchant for recycling. • Care must be taken to ensure that spillage of oils and other hazardous substances are limited during maintenance. Handling of these materials should take place within an appropriately sealed and bunded area. Should any accidental spillage take place, it must be cleaned up according to specified standards regarding bioremediation. • Spill kits must be made available on-site for the clean-up of spills and leaks of contaminants. • Disposal of waste must be in accordance with relevant legislative requirements, including the use of licensed contractors. • Waste handling, collection, and disposal operations must be managed and controlled by a waste management contractor. • Used oils and chemicals: • Appropriate disposal must be arranged with a licensed facility in consultation with the administering authority • Waste must be stored and handled according to the relevant legislation and regulations • Used oils and chemicals: o Appropriate disposal must be arranged with a licensed facility in consultation with the administering authority o Waste must be stored and handled according to the relevant legislation and regulations • General waste must be recycled where possible or disposed of at an appropriately licensed landfill.	No complaints received regarding waste on site or indiscriminate dumping Internal site audits identifying that waste segregation recycling and reuse is occurring appropriately. Provision of all appropriate waste manifests. No contamination of soil or water.	Operation and maintenance	Developer Project Manager

Description of Management Aspect	Objective	Actions to be undertaken to Mitigate Environmental Impact	Monitoring		
		Commitment / Actions Required / Key Controls	Parameters	Frequency	Responsibility
		• Hazardous waste (including hydrocarbons) and general waste must be stored and disposed of separately. • Disposal of waste must be in accordance with relevant legislative requirements, including the use of licensed contractors.			
O6: Noise Pollution	Reduction in noise	• It is recommended that a complaint register for noise be kept on the site during the construction phase. Details of the complainant including names, whether individual, household, institution etc. proximity to the construction site, etc., should be kept and reviewed by the ECO monthly. • Should the complaints persist and increase in number, then it is recommended that ambient environmental noise be undertake during operation of such activities to establish the noise impact, and mitigation measures be established to reduce the impact or completely stop the source of such noise.	No complaints received noise	Operation and maintenance	Developer Project Manager

9. MONITORING PROGRAMME

OBJECTIVE: Monitor the performance of the control strategies employed against environmental objectives and standards

A **monitoring programme** must be in place not only to ensure conformance with the EMPr but also to monitor any environmental issues and impacts which have not been accounted for in the EMPr that are, or could result in significant environmental impacts for which corrective action is required. The period and frequency of monitoring will be stipulated by the environmental authorisation (once issued). Where this is not clearly dictated, the developer will determine and stipulate the frequency of monitoring required in consultation with the relevant authority. The contractor project manager will work with the site manager of the contractor to ensure that monitoring is conducted and reported.
The aim of the monitoring and auditing process would be to routinely monitor the implementation of the specified environmental specifications, in order to:

- Monitor and audit compliance with the prescriptive and procedural terms of the environmental specifications.
- Ensure adequate and appropriate interventions to address non-compliance.
- Ensure adequate and appropriate interventions to address environmental degradation.
- Provide a mechanism for the lodging and resolution of public complaints.
- Ensure appropriate and adequate record keeping related to environmental compliance.
- Determine the effectiveness of the environmental specifications and recommend the requisite changes and uPates based on audit outcomes, in order to enhance the efficacy of environmental management on site.
- Aid communication and feedback to authorities and stakeholders.

9.1 Method of Monitoring

The independent ECO will ensure compliance with the EMPr, and will conduct monitoring activities. The ECO will undertake site inspections on a monthly basis or as specified in the environmental authorisation once issued. The ECO will report all non-compliances to the Site Manager and submit such reports to GDARD.

9.2 Environmental Monitoring Committee

Due to the proximity of the upgrade in relation to the sensitive environment an Environmental Monitoring Committee must be established. The Environmental Monitoring Committee must include representatives from the local community

9.3 Non-Conformance Report

All supervisory stuff and ECO must be provided a means to be able to submit a non-conformance report to the site manager. The Non-conformance report will describe in detail, the cause and effect of any environmental non-conformance by the contractor. Records of penalties may be required by the Authorities within 48 hours. The non-conformance report will be updated upon completion of the corrective measures indicated on the finding sheet. The report must indicate that remediation measures have been implemented timeously and that the non-conformance can be closed out to the satisfaction of the site manager and ECO.

9.4 Monitoring Reports

A monitoring report will be compiled by the ECO on a monthly basis and must be submitted to the competent authority for their records. This report should include details of the activities undertaken in the reporting period, any non-conformances or incidents recorded, corrective action required, and details of those non-conformances or incidents which have been closed out.

9.5 Internal Audits and Reporting

Internal audits must be undertaken for the project, given the nature and scale of the facility environmental audits should be conducted bi-annually (twice a year) by the Facility Manager. In addition, the Facility Manager should appoint an independent external auditor to audit the Facility. This report must indicate the date of the audit, the name of the auditor and the outcome of the audit in terms of compliance with the environmental authorisation conditions and the requirements of the OEMPr. Findings of the audit must be made available to the external auditor.

9.6 External **Audits** and Reporting

An independent external auditor must be appointed to audit the project once monthly. The auditor must compile an audit report documenting the findings of the audit. This report must indicate the date of the audit, the name of the auditor and the outcome of the audit in terms of compliance with the Environmental conditions and the requirements of the OEMPr. This report must be submitted to the competent authority. The audit reports should also be retained on site.

10. CONCLUSION

The EMPr is a dynamic document, which must be updated when required. It is considered critical that this EMPr be updated to include any additional site-specific information. This will ensure that the operation activities are planned and implemented taking identified environmental issues into account.

Provided this project is mitigated, as per the EMPr, the project will result in limited negative environmental impacts that can be mitigated through implementation of this EMPr. It is the applicant's responsibility to ensure that this EMPr is made binding on all responsible parties identified. All responsible parties should thoroughly familiarise themselves with the requirements of the EMPr.

Parties responsible for transgression of this EMPr should be held responsible for any rehabilitation that may need to be undertaken. Parties responsible for environmental degradation through irresponsible behaviour/negligence should receive penalties.

APPENDIX 1: INCIDENT AND ENVIRONMENTAL LOG

ENVIRONMENTAL INCIDENT LOG				
Date	**Env. Condition**	**Comments** *(Include any possible explanations for current condition and possible responsible parties. Include photographs, records etc. if available)*	**Corrective Action Taken** (*Give details and attach documentation as far as possible)*	**Signature**

COMPLAINTS RECORD SHEET	File Ref:	DATE:
	Page of ….	……

COMPLAINT RAISED BY:

CAPACITY OF COMPLAINANT:

COMPLAINT RECORDED BY:

COMPLAINT:

PROOSED REMEDIAL ACTION:

ECO: _____ Date: _____

NOTES BY ECO:

ECO: _____ Date: _____ Site Manager: _____ Date: _____

APPENDIX 2: DETAILS OF EAP (AND EXPERTISE) AND AFFIRMATION

CURRICULUM VITAE

Name:	**KARTHIGESAN GOVENDER**
Name of Firm:	ENVIROLUTION CONSULTING (PTY) LTD (2004 – Present)
Position:	Director and Project Manager
Date of Birth:	12 April 1974
Nationality:	South African
Languages:	English, Afrikaans

EDUCATIONAL QUALIFICATIONS

- B.Sc. – Wits University 1997
- B.Sc. (Honours) –Wits University 1999
- Certificate in Advanced Project Management – Damelin 2003

PROFESSIONAL REGISTRATION

- South African Council for Natural Scientific Professions (**SACNASP**) Reg. No. 400049/12

KEY QUALIFICATIONS and RESPONSIBILITIES

Responsibilities

Management of all projects and screening, client liaison and Financial Management.

Feasibility Studies (2000 to date):

- Ekurhuleni Regional Professional Team- Conducted Environmental feasibility studies for more than 40 proposed sites for housing development on behalf of Gauteng Department of Housing.

Environmental Management Plans (EMPs) (2004 to date):

- Compiled EMPs associated with EIAs for housing developments as well as linear (power lines, pipelines and road infrastructure) construction developments and filling stations
- Developed procedures for conducting EMP related audits
- Conducted auditing of implemented EMPs

Environmental Audits (2006 to date):

- Chrome International South Africa- Tailings dam external audit
- Bakwena Platinum Corridor Concessionaire- Rustenberg bypass
- Various audits for construction projects including linear (power lines, pipelines and road infrastructure), residential and industrial projects.

Environmental Reporting and Policy Development (2000 to 2002):

- City of Johannesburg – Updating of the State of the Environment Report
- Conducted research on sustainable development issues affecting the city of Johannesburg
- Participated in the formulation of environmental strategy and policies, including Local Agenda 21
- Evaluated and commented on EIA's or development applications

- Reported on any environmental legislation insofar as it affected the city of Johannesburg
- Writing of Projects Terms of References for Consultants as well as managing consultants
- Task Team member of World Summit on Sustainable Development (WSSD) 2002 Preparatory Committee
- Task Team member of the Local Government Summit (LGS) coordinating committee for WSSD
- Provided input to the various WSSD sub-committees (WSSD Greening *etc*.)
- Coordinated and participate in the Local Agenda 21 activities of the City of Johannesburg
- Coordinated, participated and provided input into WSSD activities of the City of Johannesburg in conjunction with external stakeholders
- Stakeholder liaison and implementation of environmental policy and legislation
- Provided input into LIDP and Environmental Policy processes
- Assisted ICLEI with WSSD related activity and local government initiatives

Environmental Impact Assessment (2004 to date)

- Exemptions (various applications) - including installation of fuel storage tanks, township and commercial developments
- EIAs for proposed Cemeteries
- EIAs for formalising of township developments
- EIAs for filling station developments
- EIAs for the relocation of Sewer Plants
- EIAs for road upgrades and development
- EIAs for proposed housing developments in Ekurhuleni Metropolitan Municipality on behalf of Gauteng Department of Housing – more than 25
- Scoping studies undertaken and project managed with budgets exceeding 2 million rand, project managed all the EIA related work for the Ekurhuleni Regional Professional Team
- EIAs for Eskom Power Transmission and Distribution Lines
- Managed and participated in various environmental projects & programmes, in conjunction with external partners and stakeholders
- EIA for the Eskom Medupi Landfill
- EIAs Johannesburg Water
    - Sewer treatment Plants
    - Network construction and Upgrades

Projects worked on and managed (2000 to 2004):

- Cities State of the Environment Report (CSOER) on the Internet – WSSD Project (Managed its updating)
- ICLEI's Cities for Climate Protection (CCP) Campaign – WSSD Project. (Coordinator for the City of Johannesburg
- Managed pilot projects focused on demand side management of energy resources : Energy efficient retrofitting of street lights as a showcase for WSSD, partnered with the International Institute for Energy Conservation (IIEC) – WSSD Project
- Managing Water for South African Cities with United Nations Center for Human settlements (UNCHS), involving Catchment Management of the Klipriver System and Upgrade
- The Strategy for Sustainable Development (SSD) for the City of Johannesburg WSSD Project
- Housing Projects with DANCED
- Green Procurement Project of the City of Johannesburg

EMPLOYMENT EXPERIENCE

ENVIROLUTION CONSULTING (PTY) LTD

Director (1 September 2004 – present)

EIMS Group
Associate and Environmental Specialist for Environmental Impact Management Services (EIMS) and Director of Tswelopele Environmental (2002- 31 August 2004)

City of Johannesburg (Braamfontein)
Environmental Management Specialist
(2000-2002)

Standard Bank
212 Smith Street, Braamfontein
Position: Bank Teller (Nov. 1996 – May 1998)

Electronic Data Systems (EDS)
Commissioner Street, Johannesburg
Position: Customer Services Consultant (June 1998 – Jan. 1999 & Jan. 2000 – Aug. 2000)
Reason for leaving: Employed by City of Johannesburg

Wits University

- 1999: Teaching assistant for first year Zoology, Botany and Medical Students, and College of Science students at Wits University.
- 1999: Mapping and sampling vegetation at Nylsvlei Nature Reserve in the Northern Transvaal.
- 1999: Tutoring Zoology and Botany to first year and College of Science students at Wits University

CURRICULUM VITAE — CHEDA SHEILA BOLINGO

Position: Environmental Consultant

Name of Firm: Envirolution Consulting

Name of Staff: Cheda Sheila Bolingo

Date of Birth: 12/02/1981

Total Years of Experience: Seven (7)

EDUCATION:

Qualification	Institution	Date obtained
MSc (Environmental Management)	University of Johannesburg	2017
BSc (Hons) (Environmental Management)	University of Johannesburg	2010
B Sc (Geography & Environmental Management)	University of Johannesburg	2008

COUNTRIES OF WORK EXPERIENCE:

South Africa

LANGUAGES:

Language	Reading	Speaking	Writing
English	Excellent	Very Good	Excellent
Zulu/Sotho	Fair	Good	Fair
Afrikaans	Fair	Fair	Fair
French	Very Good	Good	

EMPLOYMENT RECORD:

1. Organisation: **Envirolution Consulting**
Period: May 2016 to date
Position: Environmental Consultant
Reference: Mr Karthigesan Govender – Managing Director
Contact: (T) 0861 444 499

2. Organisation: **Savannah Environmental**
Period: June 2012-December 2015
Position: Environmental and GIS Consultant
Reference: Ms Tebogo Mapinga - Senior Project Manager
Contact: (C) 072 738 3836 (T) 011656 3237

3. Organisation: **Fourth Element Consultant**
Period: Feb 2011 - May 2012
Position: Environmental Consultant and GIS Practitioner
Reference: Mr Tsepo Lepono - Environmental Director
Contact: (T) 011 022 1364; (C) 083 339 9103

PROJECT EXPERIENCE:

Environmental Authorisation Processes: Environmental Impact Assessments (Scoping and EIA Phases; Basic Assessments (BA); Environmental Management Programme Reports; Environmental Feasibility Analysis for the following selected projects:

- Scoping, EIA Report & EMP for the Roodepoort Strengthening 400kV substation & 400kV power lines near Roodepoort, Gauteng
- Scoping, EIA Report & EMP for the proposed construction of the Gourikwa-Narina-Droerivier 400kV Power line and Substation upgrades near George, Western Cape Province
- EIA Report & EMP for the Blackwood Solar Energy Facility near Boshof, Free State Province.
- Scoping, EIA Report & EMP for the Boundary Solar Energy Facility near Boshof, Free State.
- Scoping, EIA Report & EMP for the Bosjesmansberg Solar Energy Facility near Copperton, Northern Cape Province.
- Scoping, EIA Report & EMP for the Kheis Solar Energy Facilties near Grootdrik, Northern Cape
- Basic Assessment Process for the Hillside 132kV substation and power line project near Middelsburg, Mpumalanga Province
- Basic Assessment Process for the Simthabi 132kV substation and power line project near Thabazimbi, Limpopo Province
- Basic Assessment Process for the Avalon Cemetery Extension in Soweto, Gauteng
- Basic Assessment Process for the Dinaledi-Spitskop Deviation 400kV power line project near Mogwase, North West Province
- Basic Assessment Process for the Sannaspos Solar Energy Facility near Bloemfontein, Free State
- Basic Assessment Process for the Machadodorp Solar Energy Facility near Machadodorp, Mpumalanga
- Basic Assessment Process for the proposed stormwater Infrastructure construction and upgrade In Zandspruit & Finetown, Gauteng Province.
- Basic Assessment Process for the Jukskei Rehabilitation, along Observatory Stream, Bezhuidenhout Valley, Gauteng Province
- Basic Assessment Process for the Olifantsfontein Rehabilitation Measures along Kaalspruit, Clayville, Gauteng Province
- Environmental Screening Report for the Bosjesmansberg Solar Energy Facility near Copperton, Northern Cape Province.
- Environmental Screening Report for the Ennerdale Extension 9 project near Ennerdale, Gauteng.
- Basic Assessment Process for the Tembisa Western Outfall Sewer in Tembisa, Ekurhuleni Metropolitan Municipality, Gauteng Province.

Public Participation Process - formed part of the above mentioned Environmental Authorisation Processes. Experience in the Public Participation Process included the following activities:

- Identification of key stakeholders and stakeholder groups;
- Notification of stakeholders;
- Conducting public meetings and/or focus group meetings;
- Compilation of public meeting presentations on MS Power Point format;
- Compiling an Issues and Responses Report from minutes of meetings held with stakeholders;
- Liaison with stakeholders via fax, email and telephone for the duration of the project;
- Establishing and maintaining relationships with key stakeholders;
- Liaison between client/ developer and stakeholders; and
- Correspondence, liaison and site meetings with the relevant authorities handling the environmental applications have also been successfully undertaken.

Environmental Compliance Auditing and ECO: Environmental monitoring for the Dorper Wind Farm near Molteno in Eastern Cape (2014), duties included the followings:

- Monitor of the implementation of the EMPr.
- Liaison with relevant authorities;
- Drafting environmental audit reports to the authorities.
- Compilation of Environmental Log Sheet for record of any impacts
- Suggesting corrective action measures to eliminate the cause of the non-conformance incidents.
- Liaison with contractors regarding overall environmental management onsite;
- Undertaking routine monitoring and appointing a competent person/institution to be responsible for specialist monitoring, if necessary.

SKILLS BASE AND CORE COMPETENCIES

- Strategic and compliance advise for all aspects of environmental assessment and management
- Working knowledge of environmental planning policies, regulatory frameworks and Environmental Auditing and compliance monitoring legislation
- Strategic and regional assessments; pre-feasibility & site selection
- Identification and assessment of potential environmental impacts and benefits
- Development of practical and achievable mitigation measures and management plans and evaluation of risk to project execution
- Environmental compliance advise, monitoring and reporting for construction projects
- Public participation/involvement and stakeholder consultation
- Experienced in assessments for both linear developments and nodal developments
- Key experience in the assessment of impacts associated with renewable energy projects
- Wide range of experience for public and private sector projects
- Research
- Compliance advice for Financial Close

- Drafting of proposals and Tenders
- GIS (ArcGIS)
- Project management and planning (including budgets)

KEY RESPONSIBILITIES

- Providing consulting services to clients for Environmental-related matters.
- Conducting Environmental Impact Assessment (EIA) processes
- Preparation of EIA reports
- Creation of maps for various projects
- Managing multidisciplinary teams
- Conducting various research
- Report writing
- Managing subcontractors
- Client communication
- Proposal preparation