

# Proposed 132 kV Powerline, Walmer, Port Elizabeth

## Draft Environmental Management Programme (EMPr)

Report Prepared for

**Nelson Mandela Bay Municipality**



Report Number 489647/2/Rev1



Report Prepared by



November 2016

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## **Draft Environmental Management Programme (EMPr)**

### **Report Prepared for**

#### **Nelson Mandela Bay Municipality**

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### **SRK Project Number 489647**

**November 2016**

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## Acronyms

**CBA:** Critical Biodiversity Area

**DEA:** Department of Environmental Affairs (National)

**DEDEAT:** Department of Economic Development, Environmental Affairs and Tourism

**EAP:** Environmental Assessment Practitioner

**ECPHRA:** Eastern Cape Provincial Heritage Resources Authority

**ECO:** Environmental Control Officer

**EIA:** Environmental Impact Assessment

**EMF:** Electro-Magnetic Field

**EMPr:** Environmental Management Programme

**NEMA:** National Environmental Management Act

**NMBM:** Nelson Mandela Bay Municipality

**RP:** Representative Person (developer) who is responsible for the implementation of the EMPr.

# 1 Introduction and Scope of Report

SRK Consulting (SRK) has been appointed by the Nelson Mandela Bay Municipality (NMBM) to undertake an environmental assessment process for the proposed 132 kV Walmer Powerline, which includes the compilation of this Environmental Management Programme (EMPr). The environmental management measures recorded in this EMPr are based on information supplied to SRK during the compilation of the Basic Assessment Report, including information from the applicant and the recommendations from specialists. This EMPr has been compiled to comply with the specific requirements of the National Environmental Management Act (No. 107 of 1998) (NEMA) Environmental Impact Assessment (EIA) Regulations (2014).

It should be noted that the EMPr is written as if the project has been authorised. This approach in no way presupposes that the project will be authorised, rather, the style of writing is aimed at making the EMPr easier to read and more easily converted into a practical management tool should the application be approved.

SRK has exercised all due care in reviewing the supplied information provided during the course of the environmental assessment process and has included the requirements of commenting authorities. The appropriateness and practicality of the management measures presented in this EMPr has been considered in terms of comments received and discussed with the applicant as necessary. NMBM is fully responsible for the implementation of the EMPr.

The EMPr has been provided to the NMBM for review, prior to submission, to determine whether the EMPr is implementable and accurate. SRK cannot be held responsible for failure of NMBM to comply with the EMPr. The EMPr is by nature a dynamic document and NEMA provides for continual updating of the EMPr, with approval from the Competent Authority.

The aim of this EMPr is to ensure that construction, operation, and maintenance activities are conducted such that potential negative environmental impacts are minimised and positive impacts are enhanced. This EMPr is not a health and safety plan and this EMPr makes no attempt to satisfy the requirements of the Occupational Health and Safety Act.

## 1.1 Environmental Assessment Practitioner (EAP)

### 1.1.1 Expertise of EAP

This EMPr was prepared under the technical guidance of Karissa Nel, and reviewed by Rob Gardiner.

**Karissa Nel (MEM, CEAPSA)** is a Senior Environmental Scientist, with more than 10 years environmental consulting experience in Environmental Impact Assessments (EIA), Environmental Management Programmes (EMPr), environmental auditing and licensing. Her training is in zoology, microbiology, aquatic ecosystems, wetland assessment and environmental management. Karissa's CV is attached as Appendix A.

**Rob Gardiner (MSc, MBA, Pr Sci Nat)** is a Principal Environmental Scientist and head of SRK's Environmental Department in Port Elizabeth. He has more than 20 years environmental consulting experience covering a broad range of projects, including Environmental Impact Assessments (EIA), Environmental Management Systems (EMS), Environmental Management Programmes (EMPr), and environmental auditing. His experience in the development, manufacturing, mining and public sectors has been gained in projects within South Africa, Lesotho, Botswana, Angola, Zimbabwe, Suriname and Argentina.





Figure 1: Site locality map for proposed 132kV Walmer Powerline



## 1.1.2 Environmental Assessment Practitioner Details

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## 2 Project Description and Environmental Objectives

### 2.1 Project Description

The proposed development involves a double circuit 132 kV powerline from the existing Lorraine 132 kV substation to the existing 132 kV 17<sup>th</sup> Avenue substation.

The proposed infrastructure will provide for future load growth in this area. Many commercial and residential developments are envisaged by landowners requiring additional capacity to be installed.

The proposed route is approximately 2.8 km long and will cross private properties as well as NMBM owned land (Please refer to Ownership Map in Appendix A).. An overhead powerline is proposed up to point K on the plan from where an underground cable will be installed and under William Moffet Drive to the eastern side of the existing 17<sup>th</sup> Avenue substation. Note that an upgrade to this substation is underway within the existing footprint and falls outside the scope of this application and process.

The following infrastructure specifications are relevant:

- All overhead lines will be constructed with dual circuit 132 kV monopole self-supporting steel structures, with servitude width of 25 m;
- Maximum span lengths are limited by line alignment but could be between 140 m and 180 m;
- Should the 'Petechane' tower type be used the servitude may be reduced to 16 m. The use of the 'Petechane' tower circuit will depend on soil conditions prevalent along the proposed alignment. A geotechnical investigation will be conducted in the detailed design stage to establish the soil conditions along the proposed alignment;
- A servitude width of 1.5 m is required for the underground cables between points K and L on the map;
- The powerline will be positioned not closer than 12.5 m from the railway line; and
- Where relevant, tower footing foundations will be specially designed for towers placed near or in a watercourse.

## 2.2 Environmental Objectives

This section specifies the impact management objectives and outcomes used to determine the extent of management action(s) required to mitigate the impacts identified during the impact assessment process.

Figure 2 illustrates the relevant environmental features and sensitivities of the area on and surrounding the proposed development site.

### 2.2.1 Planning and Design

#### Impacts on Aquatic Resources:

The soils within the study area are susceptible to erosion when subjected to high flows (high volumes and velocities), with head-cuts readily forming within the water courses. This creates bed and bank instability in the aquatic ecosystems and consequent sedimentation of downstream areas, which can negatively affect biodiversity and functioning of in stream habitats. The tower footing foundations will need to be specifically designed for the towers to be safely placed near or within the watercourse.

The impact management objective for impacts on aquatic resources is:

- Minimise changes of the hydrological regime; and
- Avoid increasing potential for erosion to occur.

#### Avifauna Impacts:

Avifauna impacts relating to collisions and electrocution due to the installation of the powerline infrastructure are a possibility. Avifauna in the surrounding area may also use the proposed infrastructure for perching and breeding, however the design of the towers should be designed in such a way that it discourages or is not conducive to provide suitable nesting sites for avifauna.

The impact management objective for avifauna impacts is:

- Prevent avifauna collisions and electrocutions; and
- Discourage avifauna nesting on the powerline infrastructure.

#### EMF Impacts:

The proximity of residential and commercial properties to the proposed powerlines has the potential for EMF exposures.

The impact management objective for EMF impact is:

- Minimise risk of EMF exposure to surrounding residents and commercial businesses.

### 2.2.2 Pre-construction activities

No pre-construction environmental impacts have been identified.

### 2.2.3 Construction phase

#### Impacts on Biodiversity

Vegetation clearance, vehicular access and excavation activities required during the construction phase may impact negatively on the biodiversity of the area as well as lead to possible increases in erosion and spread of alien vegetation.

The impact management objective for this impact is:

- Minimise impacts to natural vegetation and Critical Biodiversity Areas (CBAs); and



- Rehabilitate disturbed areas of the site as soon as possible.

### **Impacts on Traffic**

Construction at the various road crossings (Bergues Street, Circular Drive and William Moffet Drive) for the proposed alignment may require detours and/ or traffic control measures. Construction traffic may also pose a safety impact to residents living along the proposed alignment. Construction vehicles requiring access to the site may cause wear and tear of the existing roads.

The impact management objective for this impact is:

- Minimise disturbance of regular traffic along the road crossings;
- Prevent safety impacts on surrounding residents; and
- Minimise damage to existing road infrastructure.

### **Impacts on Wildlife:**

Noise and habitat destruction resulting from construction activities may displace and disturb local wildlife mainly associated with the watercourse and wetland.

The impact management objective for this impact is:

- Minimise wildlife disturbance.

### **Noise Impacts**

Construction activities will generate noise due to the operation of machinery and vehicles, causing a nuisance to residents along the proposed alignment.

The management objectives for this impact are:

- Minimise noise impacts; and
- Legal compliance with regard to noise generation.

### **Impacts on Existing Infrastructure and Private Property:**

Existing infrastructure including the railway line (north of Macon Road, Lorraine), NMBM road infrastructure, fences and gates, Telkom cables, existing Eskom cables, NMBM water and sewer infrastructure as well as adjacent private property may be disturbed through construction activities.

The impact management objective for this impact is:

- Avoid damage to existing infrastructure and private property.

### **Impacts on Aquatic Resources:**

Construction activities have the potential to impact on the hydrological regime of the aquatic habitats. Due to the susceptibility of the soils in the area, this could lead to increased erosion impacting on the functioning of the watercourse and wetland. During construction various materials, such as sediments, diesel, oils and cement, could pose a threat to the continued functioning downstream areas, if by chance it is dispersed via surface run-off, or are allowed to permeate into the groundwater. Changes to water quality can negatively impact on the functioning of plants and other instream biota.

The impact management objective for this impact is:

- Minimise impacts to hydrological regime of affected watercourses;
- Minimise potential for increased erosion; and
- Minimise impacts on aquatic ecosystems and biota.

**Impacts on Archaeological Resources:**

Although the proposed alignment is located in an area of low archaeological cultural sensitivity, it is possible that archaeological heritage material exists below the surface and could be impacted during construction.

The impact management objective for this impact is:

- Preservation of archaeological resources.

**Impacts on Palaeontological Resources:**

Although the proposed alignment is located in an area of low palaeontological cultural sensitivity, it is possible that palaeontological heritage material exists below the surface and could be impacted during construction.

The impact management objective for this impact is:

- Preservation of palaeontological resources.

**Impacts on Air Quality:**

Windblown dust from material stockpiles and cleared areas may affect surrounding residents, road users and pedestrians by creating a nuisance and safety impact to traffic..

The impact management objective for this impact is:

- Minimise air pollution.

**Waste Management:**

Construction waste as well as small amounts of domestic waste will be generated. Lack of proper management of the waste on the site may lead to wind-blown litter and dumping creating a negative visual impact and potentially impacting on aquatic ecosystems.

The impact management objective for this impact is:

- Prevent pollution of watercourses and surrounding habitat; and
- Legally compliant management of solid waste.

**Socio-Economic Impacts:**

The proposed powerline may generate temporary employment opportunities as well as contribute to the improvement of services within the general area.

The impact management objective for this impact is:

- Minimise impact on surrounding community;
- Maximise employment of local labour; and
- Maximise skills transfer.

**2.2.4 Rehabilitation after construction**

Note that no closure phase is proposed and therefore post closure measures are not applicable for the listed activities.

Rehabilitation should commence immediately after construction in the relevant areas using topsoil stripped before construction. Rehabilitated areas should be monitored and measures must be implemented to ensure that topsoil does not wash away. If erosion and/or sedimentation of downstream areas occur, appropriate measures must be implemented to prevent further erosion and to trap any excessive sediments generated during and after construction.

The management objectives for this impact are:

- Rehabilitation as soon as possible after construction to prevent impacts.

## 2.2.5 Operational phase

### Socio-Economic Impacts

The proposed powerline add to the improvement of services to the greater area. It will supply electricity to future proposed residential and commercial developments along the route and greater area as well as supplement the current energy demands of existing residential and commercial properties along the route.

The management objectives for this impact are:

- Minimise impact on surrounding community;
- Maximise benefits to local business and labour force; and
- Prevent degradation of energy supply infrastructure.

### Noise Impacts:

Noise generated by the powerlines during the operational phase may have a nuisance effect on surrounding residents. Noise may result from older or dirty powerlines or during periods of high humidity or rainfall.

The impact management objective for noise impact is:

- Minimise noise generated during the operational phase of the proposed development.

## 3 Impact Management

This section specifies the impact management outcomes and impact management actions required for the aspects and potential impacts related to the proposed development. The manner in which the impact management objectives and outcomes, identified above, will be achieved. Where applicable actions will include activities to:

- (i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;
- (ii) comply with any prescribed environmental management standards or practices;
- (iii) comply with any applicable provisions of the Act regarding closure, where applicable; and
- (iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable

The above are detailed in Table 1 and Table 2 for the construction and operational phases respectively.

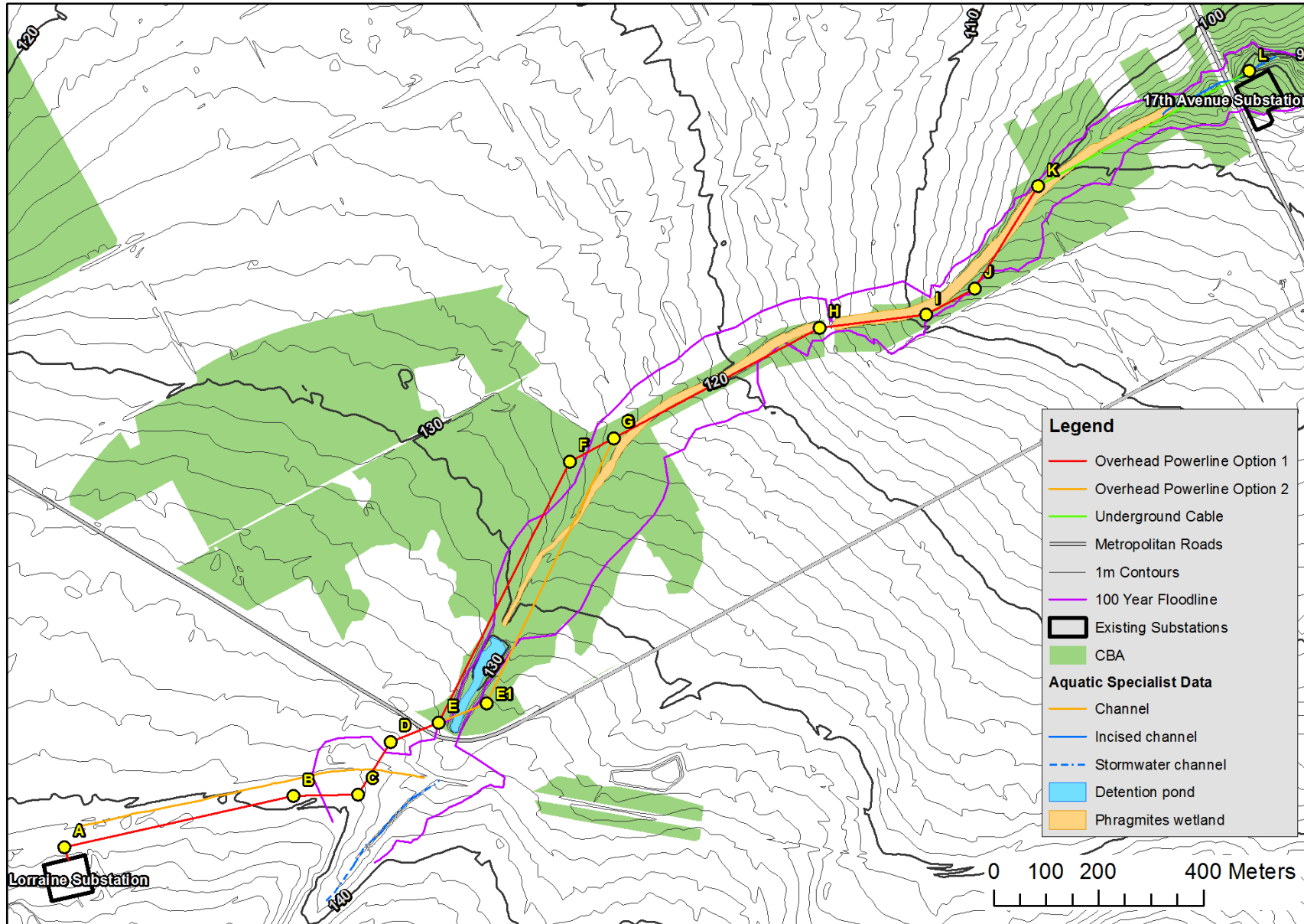


Figure 2: Environmental Sensitivities map for the proposed alignment

**Table 1: Mitigation and management measures for the construction phase**

Environmental Aspect	Potential Environmental Impact	Recommended Mitigation measures		
		Management and mitigation measure	Time-frame	Responsibility
Clearing of vegetation for construction works.	<u>Impacts on Biodiversity:</u> Loss and disturbance of biodiversity, potential increased erosion and the spread of invasive alien vegetation may be promoted through the disturbance to land.	<ul style="list-style-type: none"> <li>• A detailed walk down survey must be conducted once the towers positions are known by an aquatic specialist due to the close proximity of either of the options to the wetlands and water courses. This must also include an opportunity to assess the final design provisions prior to construction to ensure that minimal impact will occur. Once the tower positions are known site specific recommendations could be provided by the specialist;</li> <li>• The site camp should be placed in an already disturbed area to minimise additional disturbance and clearing of vegetation;</li> <li>• The site camp footprint must be minimised and accessible via existing access roads;</li> <li>• Rehabilitation of cleared areas should be conducted as soon as possible after construction at the specific site;</li> <li>• Rehabilitation should involve revegetation with indigenous vegetation;</li> <li>• Minimise cleared and disturbed areas and use already transformed areas where possible;</li> <li>• Use existing access roads and where new routes are required use transformed areas wherever possible, most importantly in the CBA areas;</li> <li>• Tower footprints must be kept to a minimum and if possible outside of the demarcated water course;</li> <li>• Permits would be required for the relocation of any protected plants, e.g. Yellowwood trees;</li> <li>• Implementation of an alien invasive vegetation removal programme during rehabilitation of the site (optional); and</li> </ul> <p>Removal of all invasive alien plants from disturbed areas before they reach seed-bearing age.</p>	Duration of construction and defects liability period (1 year)	Contractor



Environmental Aspect	Potential Environmental Impact	Recommended Mitigation measures		
		Management and mitigation measure	Time-frame	Responsibility
Construction and domestic waste generated during construction	<p><u>Waste Impacts:</u> Lack of proper management of the waste on the site may lead to wind-blown litter and contamination resulting from waste and rubble, creating a negative visual impact and impacting on aquatic ecosystems.</p>	<ul style="list-style-type: none"> <li>All waste generated on site shall be collected and appropriately disposed of at a registered municipal landfill site on a regular basis;</li> <li>No waste is to be buried or burned on the site;</li> <li>Chemical toilets must be provided for workers and these must be regularly serviced (and proof of correct sewage disposal maintained for auditing purposes);</li> <li>Littering and contamination of water sources during construction must be prevented by effective construction camp management;</li> <li>Hazardous waste (if applicable) should be disposed of at a registered hazardous landfill facility and proof of correct disposal should be obtained;</li> <li>Sufficient weather and vermin proof portable bins (with lids) shall be provided. The contractor shall be responsible for the disposal of domestic waste generated as a result of work activities;</li> <li>Littering is strictly prohibited. Litter shall be disposed of in the on-site bins;</li> <li>Where possible, waste shall be re-used or recycled;</li> <li>The contractor shall inform sub-contractors and delivery drivers (e.g. of concrete, sand etc.) of procedures and restrictions in terms of the EMPr, and shall only use designated access roads and material storage areas;</li> <li>All loads shall be secured / enclosed to prevent spillage during transport;</li> <li>The Contractor shall be responsible for clean-up resulting from failure of sub-contractors to properly contain materials;</li> <li>All cement bags shall be disposed of at a licensed waste disposal facility;</li> <li>All staff shall be trained on correct waste management;</li> <li>The Contractor will be responsible for removing all litter, construction waste and contaminated material from the site and surrounding areas affected by the construction activities and recycling or disposing of it at a registered waste landfill facility; and</li> <li>All waste shall be secured / enclosed to prevent spillage during transportation; and</li> <li>Records of disposal of all waste generated on site shall be maintained for auditing purposes.</li> </ul>	Duration of construction	Contractor
Construction vehicles and traffic control measures	<p><u>Traffic Impacts:</u> Construction at the various road crossings may require detours and/or traffic control measures. The presence of construction traffic may also pose a safety threat to surrounding residents as well as possibly cause wear and</p>	<ul style="list-style-type: none"> <li>Implementation of strict traffic safety measures and speed limits for all construction related traffic;</li> <li>Appropriate traffic warning signage to be in place; and</li> <li>Appropriate road maintenance programme to be implemented.</li> </ul>	Duration of construction	Contractor

Environmental Aspect	Potential Environmental Impact	Recommended Mitigation measures		
		Management and mitigation measure	Time-frame	Responsibility
	tear of the existing roads.			
Excavation activities	<p><u>Heritage Impacts:</u> Damage or destruction of palaeontological or archaeological resources as well existing service infrastructure and/ or private property.</p>	<ul style="list-style-type: none"> <li>Locations of existing services to be determined and mapped prior to the commencement of construction;</li> <li>Consultation with the potentially affected parties (e.g. NMBM, Eskom, property owners, etc.) should be conducted if any services positions are unclear;</li> <li>Manual excavation in areas where services infrastructure is present;</li> <li>The appropriate safety precautions must be taken at all times;</li> <li>Should any existing services be damaged as a result of the construction activities, the affected parties should be notified and the relevant actions taken to repair damages as soon as possible;</li> <li>If concentrations of archaeological, palaeontological and/ or historical heritage material, marine shells, and/ or human remains are uncovered during construction, all work must cease immediately and be reported to the Albany Museum (046 622 2312) and/ or ECPHRA (043 745 0888) so that systematic and professional investigation/ excavation can be undertaken;</li> <li>The ECO as well as the construction managers/ foremen should be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites (refer to appendix D); and</li> <li>The onus is on the developer to ensure that this agreement is honoured in accordance with the National Heritage Act (Act No. 25 of 1999).</li> </ul>	Duration of construction	Contractor
Storage and handling of environmentally hazardous materials	<p><u>Waste Impacts:</u> Leaks and spills of environmentally hazardous materials (e.g. cement, oils and fuels) has the potential to impact on surface and/ or groundwater resources if not correctly managed.</p>	<ul style="list-style-type: none"> <li>The contractor shall take all reasonable steps to prevent the pollution of soil and/or groundwater by fuels and oils as a result of his activities;</li> <li>No vehicles to refuel within watercourse / wetlands;</li> <li>Chemicals used for construction must be stored safely on site and surrounded by bunds. Chemical storage containers must be regularly inspected so that any leaks are detected early;</li> <li>Littering and contamination of water sources during construction must be prevented by effective construction camp management;</li> <li>Emergency plans must be in place in case of spillages onto road surfaces and water courses; and</li> <li>The construction camp and necessary ablution facilities meant for construction workers must be beyond the 32m of any of the watercourses</li> </ul>	Duration of construction	Contractor Monitoring by ECO
Earthworks, vehicle movement on unpaved	<p><u>Air quality Impacts:</u> Impacts on the air quality of the surrounding area, such as the generation of dust, and</p>	<ul style="list-style-type: none"> <li>Minimise vegetation clearing and soil disturbance, and rehabilitate cleared areas as soon as possible;</li> <li>Dust suppression techniques, such as wetting or covering potential dust sources, should be implemented to minimise the dust impact if required, especially on windy days; and</li> </ul>	Duration of construction	Contractor

Environmental Aspect	Potential Environmental Impact	Recommended Mitigation measures		
		Management and mitigation measure	Time-frame	Responsibility
surfaces, stockpiling of soils and vegetation clearing	exhaust emissions.	<ul style="list-style-type: none"> <li>Limit vehicle speeds on the site for all vehicles.</li> </ul>		
	<u>Impacts on Aquatic Resources (including wetlands):</u> Impacts on surface and/ or groundwater resources through sedimentation from stormwater runoff from bare surfaces.	<ul style="list-style-type: none"> <li>No stockpiling should take place within a water course;</li> <li>All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds;</li> <li>Stockpiles must be located away from river channels;</li> <li>Erosion and sedimentation into channels must be minimised through the effective stabilisation (gabions and Reno mattresses) and the re-vegetation of any disturbed riverbanks;</li> </ul>	Duration of construction	Contractor
Workers on site	<u>Socio-economic &amp; other impacts:</u> Presence of construction workers on site may lead to various impacts on the surrounding area and disturbance of residents and wildlife resulting from, ablutions, fires, noise, etc.	<ul style="list-style-type: none"> <li>Natural areas that are not affected by the footprint should remain as such. Efforts should also be made to avoid disturbing such sites during construction;</li> <li>Activities that may disrupt neighbours must be preceded by notice being given to the affected neighbours at least 24 hours in advance;</li> <li>Establish a management forum comprising key stakeholders to monitor and identify potential problems that may arise due to the influx of workers to the area;</li> <li>Assign a dedicated person to deal with complaints and concerns of affected parties</li> <li>A complaints record must be kept to record any complaints lodged and how they are addressed;</li> <li>Construction activities should be kept to normal working hours (i.e. 6:00 to 18:00, Monday to Saturday) according to the Noise Control Regulations in terms of the Environmental Conservation Act (Act 73 of 1989) to reduce the noise impact to an acceptable level;</li> <li>Activities that may disrupt neighbours (e.g. delivery trucks, blasting and other excessively noisy activities) must be preceded by notice being given to the affected neighbours at least 24 hours in advance;</li> <li>No sound amplification equipment such as sirens, loud hailers or hooters are to be used on site except in emergencies and no amplified music is to be permitted on site;</li> <li>Equipment that is fitted with noise reduction facilities (e.g. side flaps, silencers, etc.) must be used as per operating instructions and maintained properly during site operations;</li> <li>Hunting and harm to fauna by construction workers will be prohibited;</li> <li>No fires are permitted on site;</li> <li>Smoking shall only be permitted in designated smoking areas in the site camp;</li> <li>A fire officer shall be appointed by the contractor who shall be responsible for co-ordinating rapid, appropriate responses in the event of a fire;</li> <li>Sufficient fire-fighting equipment shall be maintained and accessible on site at all times;</li> <li>Only the designated ablution facilities may be used for sanitation purposes; and</li> <li>The ECO shall designate an area on the site for the placement of portable chemical toilets,;</li> </ul>	Duration of construction	Contractor

Environmental Aspect	Potential Environmental Impact	Recommended Mitigation measures		
		Management and mitigation measure	Time-frame	Responsibility
		<ul style="list-style-type: none"> <li>Toilets are to be provided by the contractor for workers at a ratio of at least 1 toilet per 20 workers or as per specifications of the supplier, and must be situated in close proximity to all work areas;</li> <li>Toilets shall be maintained and properly equipped and shall be serviced regularly by a reputable contractor and the contents shall be removed to a licensed disposal facility; and</li> <li>Service certificates must be filed by the contractor for inclusion in the audit reports.</li> </ul>		
Benefits to local community and economy	<u>Socio-economic impacts:</u> Employment and business opportunities may arise from construction related activities.	<ul style="list-style-type: none"> <li>The developer should encourage the contractor to increase the local procurement practices and promote the employment of people from local communities, as far as feasible, to maximise the benefits to the local economies;</li> <li>Employment labour-intensive methods in construction where feasible;</li> <li>Sub-contract to local construction companies particularly SMMEs and BBBEE compliant enterprises where possible;</li> <li>Use local suppliers where feasible and arrange with the local SMMEs to provide transport and other services to construction crews; and</li> <li>The developer should engage with local authorities and business organisations to investigate the possibility of procuring construction materials, goods and products from local suppliers where feasible.</li> </ul>		

Table 2: Mitigation and management measures for the operational phase

Environmental Aspect	Potential Environmental Impact	Recommended Mitigation measures		
		Management and mitigation measure	Time-frame	Responsibility
Presence of powerline tower infrastructure, including the servitude area.	<u>Visual Impacts:</u> Large pylons and conductors as well as dumping and windblown litter accumulating within the servitude can pose an aesthetic impact, affecting surrounding residents and visitors to the area.	<ul style="list-style-type: none"> <li>Regular maintenance of infrastructure, including swift and appropriate repairs if required;</li> <li>The powerline servitude shall be kept clear of alien vegetation and dumping;</li> <li>In the event that illegal dumping is observed along the power line alignment, then the NMBM's Electricity and Energy personnel shall notify the NMBM cleansing/ waste management personnel; and</li> <li>Should illegal dumping persist, then the NMBM Electricity and Energy Business Unit shall consult with the NMBM's waste management personnel to identify methods (e.g. bollards restricting access or lockable entrance points) for reducing instances of illegal dumping.</li> </ul>	Duration of operation	NMBM
Proximity of powerline infrastructure to residential and commercial	<u>EMF &amp; Noise impacts:</u> The proximity of the powerline infrastructure has the potential to lead to EMF exposure and increased	<ul style="list-style-type: none"> <li>Regular check-ups and proper maintenance of the powerlines, sub-station and associated structures to prevent unnecessary high noise levels from these structures;</li> <li>The use of polymer insulators to minimize insulator noise;</li> <li>Attachment of dampeners to the powerlines to minimize Aeolian noise;</li> </ul>	Design and duration of operation	NMBM

Environmental Aspect	Potential Environmental Impact	Recommended Mitigation measures		
		Management and mitigation measure	Time-frame	Responsibility
properties.	noise nuisance. The proximity of the powerline also has the potential to affect surrounding property values.	<ul style="list-style-type: none"> <li>No buildings shall be constructed within the powerline servitude;</li> <li>During maintenance activities, NMBM personnel should ensure that no vagrants stay within the powerline servitude;</li> <li>Proper rehabilitation as well as monitoring and clearing of alien invasive vegetation by the Contractor, during the course of the construction and defects liability periods, before they become seed bearing; and</li> <li>Ongoing maintenance of areas disturbed during the operational phase.</li> </ul>		
Collisions between avifauna and powerline infrastructure	<p><u>Avifauna impacts:</u></p> <p>Avifauna impacts relating to collisions and electrocution due to the installation of the powerline infrastructure are a possibility. Avifauna in the surrounding area may also use the proposed infrastructure for perching and breeding.</p>	<ul style="list-style-type: none"> <li>Proposed monopole structure is preferred in terms of avifaunal impacts as opposed to 5-pole wooden towers;</li> <li>Pylons are to be fitted with perching brackets and the river crossing should be marked with suitable anti-collision marking devices to mitigate the impact of bird collision;</li> <li>Where there is a particular risk of collisions by birds (specifically along the portion of the alignment which runs parallel to the watercourse west of the Walmer 17<sup>th</sup> Avenue substation), install Static Bird Flight Diverters (recommended) or Bird Flappers (alternative) on the shield wires of the power lines in the servitude corridor to make the lines more visible;</li> <li>Monitoring for avifaunal mortality along the powerline during maintenance activities and additional mitigation measures such as bird flight diverters should be fitted if there are places where regular mortality occurs; and</li> <li>Keep the powerline servitude clear of alien vegetation and dumping.</li> </ul>	Duration of operation	NMBM
Powerline and servitude maintenance	<p><u>Fire risk (safety):</u></p> <p>Failure to maintain the powerline and powerline servitude may pose a potential fire risk.</p>	<ul style="list-style-type: none"> <li>Regular inspections of the powerline must take place to monitor its operational status;</li> <li>Regular maintenance must be undertaken to repair faults and broken infrastructure; and</li> <li>Keep the powerline servitude clear of very high and alien vegetation.</li> </ul>	Duration of operation	NMBM
Benefits to local businesses and labour force.	<p><u>Socio-economic impacts:</u></p> <p>Regularly required maintenance activities may present opportunities for local businesses and employment opportunities for local labour force.</p>	<ul style="list-style-type: none"> <li>Where possible, local labour should be considered for employment so as to increase the positive impact on the local economy;</li> <li>As far as possible, local small and medium enterprises should be approached to investigate the opportunities to supply maintenance services; and</li> <li>The operator responsible for the maintenance of the powerline and servitude should be encouraged to, as far as possible, procure materials, goods and products required for the operation of the facility from local suppliers to increase the positive impact in the local economy.</li> </ul>	Duration of operation	NMBM



## 4 Monitoring, Reporting and Auditing

Site inspections by an Environmental Control Officer (ECO) must be conducted on a monthly basis during construction to ensure continued compliance with the conditions of the environmental authorisation and the measures contained in the approved EMPr.

Monthly audit reports are to be prepared by the ECO and submitted to the developer, engineering representative, contractor, and competent authority.

Monitoring measures during the operational phase is as follows:

- Regular visual inspections must be conducted of all powerline infrastructure to check for wear or damage as well as roosting birds and vagrants.

## 5 Environmental Awareness Plan

On-site training must be provided for all contractors and personnel during both the construction and operational phases of the project. No personnel may be allowed onto site without having been instructed on the requirements of the approved EMPr and the Environmental Authorisation conditions.

The training must deal specifically with triggers that would require the implementation of mitigation measures contained in the EMPr. These include, but are not limited to:

- Identification and avoidance of environmentally sensitive features on/ near the site, specifically watercourses and wetlands;
- Identification of potential heritage resources (see app for guidelines for the identification of archaeological and historical material);
- Materials handling practices; and
- Waste management practices.

It is incumbent upon the contractor to convey the sentiments of the EMPr to all personnel involved in the construction operations (including sub-contractors) and the specific provisions of the EMPr. This should be done via regular toolbox talks as well as more formal training sessions, and attendance registers maintained for auditing purposes.

## 6 Organisational Structure

The general roles and responsibilities of various parties are outlined below.

### 6.1 The Developer: Nelson Mandela Bay Municipality (NMBM)

NMBM shall ultimately be responsible for the implementation of the EMPr and shall appoint a representative, the Responsible Person (RP), who shall:

- Ensure that the Contractor is duly informed of the EMPr and associated responsibilities and implications of this EMPr;
- Monitor the Contractor's activities with regard to the requirements outlined in the EMPr;
- Act as a point of contact for local residents and community members;
- Ensure that the Contractor remedies problems in a timely manner and to the satisfaction of the authorities; and
- Notify the authorities and the Environmental Control Officer (ECO) should problems arise that are not remedied effectively, or of any change in the development or changes in project specification that could significantly impact negatively on the environment.

### 6.2 The Contractor

The contractor will be responsible for:

- Ensuring all activities on the site are undertaken in accordance with the EMPr;
- Informing all employees and sub-contractors of their roles and responsibilities in terms of the EMPr;
- Ensuring that all employees and sub-contractors comply with this EMPr; and
- The Contractor has a duty to demonstrate respect and care for the environment in which they are operating. They will be responsible for the cost of rehabilitation, to the satisfaction of the ECO, of any environmental damage that may result from non-compliance with the EMPr, environmental regulations and relevant legislation.

### **6.3 The Environmental Control Officer (ECO)**

An Environmental Control Officer (ECO) who is a qualified environmental professional with the relevant environmental expertise, and independent of the RP, shall be appointed for the duration of the construction activities. The ECO's duties are as follows:

- The ECO shall undertake an initial site visit in conjunction with the Contractor, during which sensitive areas that should be avoided will be identified, and environmental concerns discussed;
- Photographs should be taken of the construction area and area allocated for the construction camp from logged (co-ordinate) points by the ECO before construction commences and after construction has been completed;
- Undertake monthly audits on the implementation of the EMPr and submit audit reports to SRK Consulting, NMBM and the environmental authorities on request; and
- Undertake a post-construction inspection, which may result in recommendations for additional clean-up and rehabilitation measures.

## **7 EMPr Procedure**

The EMPr implementation procedure is outlined below:

- The ECO shall undertake an initial site visit in conjunction with the RP and the Contractor, during which sensitive areas that should be avoided will be identified, and environmental concerns discussed;
- Photographs should be taken of the construction area and area allocated for the construction camp from logged (co-ordinate) points by the ECO before construction commences and after construction has been completed;
- The contractor shall train his employees regarding the importance of the EMPr;
- The ECO shall undertake monthly audits of the construction activities and submit the reports to DEDEAT, SRK Consulting and the developer in order to ensure that the EMPr is being implemented; and
- The ECO shall undertake a final audit of the site on completion of construction and submit a Final Audit Report to DEDEAT and the developer.

## Appendices

## **Appendix A: CV of Environmental Assessment Practitioner**

## **Appendix B: Site Layout Diagram**



## **Appendix C: Contractor Code of Conduct**

## Nelson Mandela Bay Municipality (NMBM)

### ENVIRONMENTAL CODE OF CONDUCT FOR BUILDING CONTRACTORS

Contractors shall ensure that all sub-contractors, employees, suppliers, agents, etc., are fully aware of the environmental issues detailed in the Environmental Management Plan. Contractors must investigate and comply with all existing regulations and laws/ bylaws unless the Relevant Authority grants specific written authority waiving compliance with any legislation.

The following list represents the basic Do's and Don'ts towards environmental awareness, which all participants in this project must consider whilst carrying out their tasks. These are not exhaustive and serve as a quick reference aid.

#### DO:

- Clear your work areas of litter and building rubbish at the end of each day – use the waste bins provided and ensure that litter will not blow away.
- Maintain waste removal system.
- Dispose of cigarettes and matches carefully. (These pose a fire risk and furthermore littering is an offence.)
- Use the toilet facilities provided and keep them clean.
- Report dirty or full toilet facilities.
- Prevent contamination or pollution of streams and water channels.
- Concrete batching areas should be appropriately placed and cement effluent from washing areas should be contained and evaporated and the remaining sludge disposed of at a registered disposal facility.
- Report injured animals.
- Report heritage remains immediately.
- Ensure that vehicles and machinery do not leak fuel or oils.
- Report all fuel or oil spills immediately & stop the spill continuing.
- Confine work and storage of equipment to within the immediate work area.
- Prevent excessive dust and noise.
- Use safety equipment and comply with all safety procedures.
- Ensure a working fire extinguisher is immediately at hand if any “hot work” is undertaken e.g. Welding, grinding, gas cutting etc.
- Drive on designated routes only.
- Respect existing services at all times.

#### DO NOT:

- Remove or damage vegetation without direct instruction.
- Injure, trap, feed or harm any animals – this includes birds, frogs, snakes, lizards etc.
- Remove any heritage remains.
- Make fires.
- Allow cement or cement bags to blow around.
- Litter or leave food lying around.
- Allow waste, litter, oils or foreign materials into streams.
- Enter any fenced off or marked area.
- Overnight on site.
- Speed or drive recklessly.

## **Appendix D: Guidelines for the identification of archaeological and historical material**

## **Guidelines for the identification of archaeological and historical material**

### 1. Human Skeletal material

Human remains, whether the complete remains of an individual buried during the past, or scattered human remains resulting from disturbance of the grave, should be reported. In general the remains are buried in a flexed position on their sides, but are also found buried in a sitting position with a flat stone capping and developers are requested to be on the alert for this.

### 2. Freshwater mussel middens

Freshwater mussels are found in the muddy banks of rivers and streams and were collected by people in the past as a food resource. Freshwater mussel shell middens are accumulations of mussel shell and are usually found close to rivers and streams. These shell middens frequently contain stone tools, pottery, bone, and occasionally human remains. Shell middens may be of various sizes and depths, but an accumulation which exceeds 1 m<sup>2</sup> in extent, should be reported to an archaeologist.

### 3. Stone artefacts

These are difficult for the layman to identify. However, large accumulations of flaked stones which do not appear to have been distributed naturally should be reported. If the stone tools are associated with bone remains, development should be halted immediately and archaeologists notified

### 4. Fossil bone

Fossil bones may be found embedded in geological deposits. Any concentrations of bones, whether fossilized or not, should be reported.

### 5. Large stone features

They come in different forms and sizes, but are easy to identify. The most common are roughly circular stone walls (mostly collapsed) and may represent stock enclosures, remains of wind breaks or cooking shelters. Others consist of large piles of stones of different sizes and heights and are known as isisivane. They are usually near river and mountain crossings. Their purpose and meaning is not fully understood, however, some are thought to represent burial cairns while others may have symbolic value.

### 6. Historical artefacts or features

These are easy to identify and include foundations of buildings or other construction features and items from domestic and military activities.

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