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# PROPOSED ESTABLISHMENT OF A COAL-FIRED POWER STATION AND ASSOCIATED INFRASTRUCTURE AT TRANSALLOYS SMELTER COMPLEX, MPUMALANGA PROVINCE

DEA Ref No: 14/12/16/3/3/3/97

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## DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

Submitted as part of the Draft Environmental Impact Assessment  
Report

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## PROJECT DETAILS

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## DEFINITIONS AND TERMINOLOGY

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**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, process or technology alternatives, temporal alternatives or the 'do nothing' alternative.

**Archaeological material:** Remains resulting from human activities which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures.

**Commence:** The start of any physical activity, including site preparation and any other activity on site furtherance of a listed activity or specified activity, but does not include any activity required for the purposes of an investigation or feasibility study as long as such investigation or feasibility study does not constitute a listed activity or specified activity.

**Commercial Operation date:** The date after which all testing and commissioning has been completed and is the initiation date to which the seller can start producing electricity for sale (i.e. when the project has been substantially completed).

**Commissioning:** Commissioning commences once construction is completed. Commissioning covers all activities including testing after all components of the power station are installed.

**Construction:** Construction means the building, erection or establishment of a facility, structure or infrastructure that is necessary for the undertaking of a listed or specified activity. Construction begins with any activity which requires Environmental Authorisation.

**Cumulative impacts:** The impact of an activity that in itself may not be significant, but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

**Decommissioning:** To take out of active service permanently or dismantle partly or wholly, or closure of a facility to the extent that it cannot be readily re-commissioned. This usually occurs at the end of the life of a facility.

**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

**'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.

**Drainage:** 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

**Endangered species:** Taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating. Included here are taxa whose numbers of individuals have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to be in immediate danger of extinction.

**Endemic:** An "endemic" is a species that grows in a particular area (is endemic to that region) and has a restricted distribution. It is only found in a particular place. Whether something is endemic or not depends on the geographical boundaries of the area in question and the area can be defined at different scales.

**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 assessment practitioner:** An individual responsible for the planning, management and coordinating of environmental management plan or any other appropriate environmental instruments introduced by legislation.

**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:** An operational plan that organises and co-ordinates mitigation, rehabilitation and monitoring measures in order to guide the implementation of a proposal and its on-going maintenance after implementation.

**Fossil:** Mineralised bones of animals, shellfish, plants and marine animals. A trace fossil is the track or footprint of a fossil animal that is preserved in stone or consolidated sediment.

**Heritage:** That which is inherited and forms part of the National Estate (Historical places, objects, fossils as defined by the National Heritage Resources Act of 2000).

**Hazardous waste:** Any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment (Van der Linde and Feris, 2010;pg 185).

**Incident:** An undesired event which may result in a significant environmental impact but can be managed through internal response

**Indigenous:** All biological organisms that occurred naturally within the study area prior to 1800

**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 general public.

**Method statement:** method statement is a written submission to the ECO and the site manager (or engineer) by the EPC Contractor in collaboration with his/her EO.

**Perennial and non-perennial:** Perennial systems contain flow or standing water for all or a large proportion of any given year, while non-perennial systems are episodic or ephemeral and thus contains flows for short periods, such as a few hours or days in the case of drainage lines.

**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 of waste or substances).

**Pre-construction:** The period prior to the commencement of construction, which may include activities which do not require Environmental Authorisation (e.g. geotechnical surveys).

**Riparian:** the area of land adjacent to a stream or river that is influenced by stream-induced or related processes. Riparian areas which are saturated or flooded for prolonged periods would be considered wetlands and could be described as riparian wetlands. However, some riparian areas are not wetlands (e.g. an area where alluvium is periodically deposited by a stream during floods but which is well drained).

**Rare species:** Taxa with small world populations that are not at present Endangered or Vulnerable, but are at risk as some unexpected threat could easily cause a critical decline. These taxa are usually localised within restricted geographical areas or habitats or are thinly scattered over a more extensive range. This category was termed Critically Rare by Hall and Veldhuis (1985) to distinguish it from the more generally used word "rare".

**Red data species:** Species listed in terms of the International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species, and/or in terms of the South African Red Data list. In terms of the South African Red Data list, species are classified as being extinct, endangered, vulnerable, rare, indeterminate, insufficiently known or not threatened (see other definitions within this glossary).

**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:** Any substance, whether or not that substance can be reduced re-used, recycled and recovered; that is surplus, unwanted, rejected, discarded, abandoned or disposed of which the generator has no further use for the purposes of production. Any product which must be treated and disposed of, that is identified as waste by the minister of Environmental affairs (by notice in the Gazette) and includes waste generated by the mining, medical or other sectors, but: A by-product is not considered waste, and portion of waste, once re-used, recycled and recovered, ceases to be waste (Van der Linde and Feris, 2010; pg 186).

**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

**Wetlands:** land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which under normal circumstances supports or would support vegetation typically adapted to life in saturated soil (Water Act 36 of 1998); land where an excess of water is the dominant factor determining the nature of the soil development and the types of plants and animals living at the soil surface (Cowardin et al., 1979).

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## PROJECT DETAILS

## CHAPTER 1

Transalloys (Pty) Ltd, a producer of export grade Siliconmanganese, as an energy intensive electricity user, proposes to develop a Coal-Fired Power Plant and associated infrastructure adjacent to its smelter complex near eMalahleni, Mpumalanga Province.

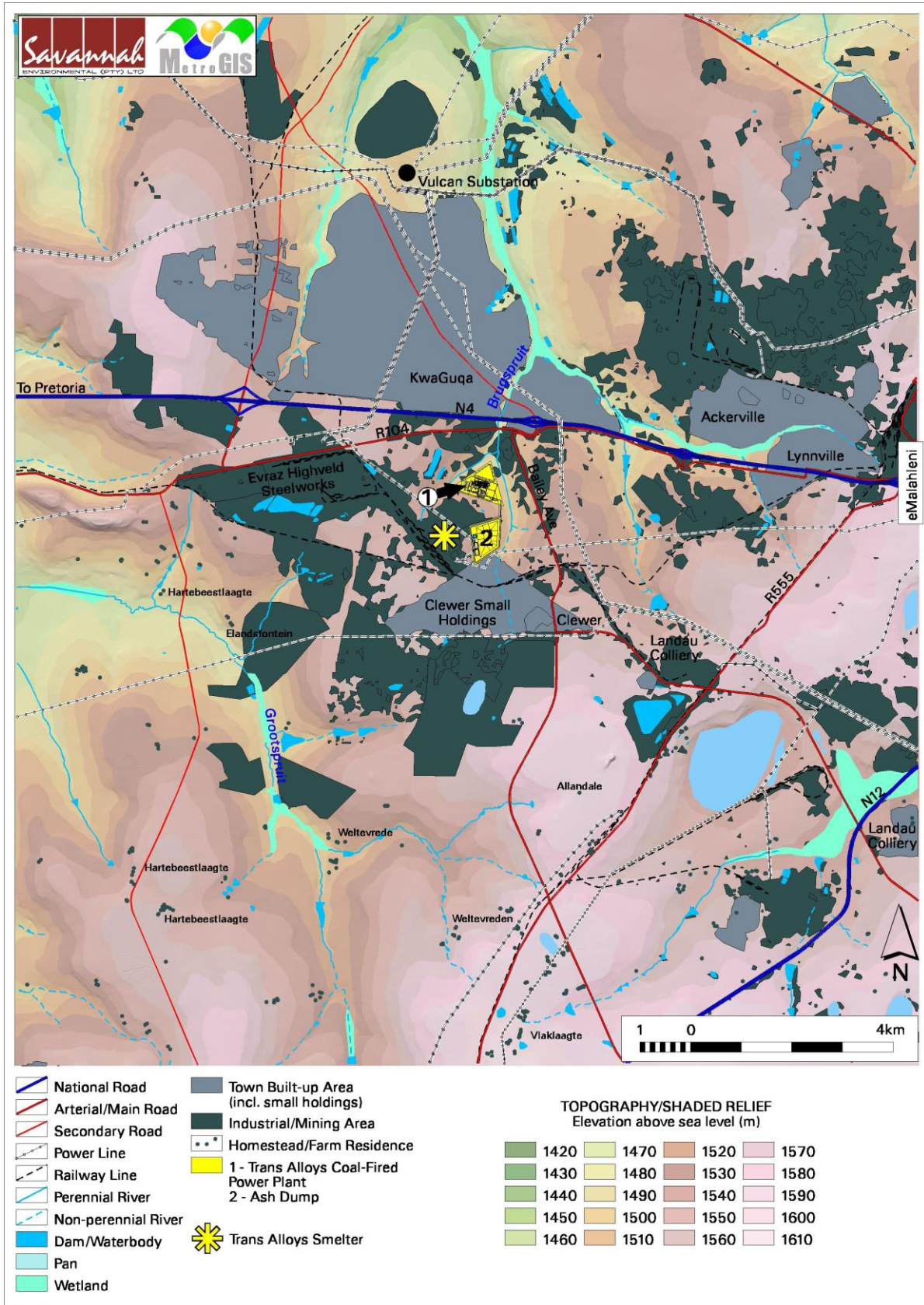
The proposed power plant will have a generating capacity of up to 55 MW in order to meet Transalloys' current electricity demands and future expansion requirements.

The existing Transalloys smelter complex is located within 8km west of eMalahleni (formerly Witbank) in the eMalahleni Local Municipality within the greater Nkangala District Municipality of the Mpumalanga Province. Transalloys is located south of the N4 highway within 700m from the Clewer Agricultural Holdings to the south, within 1.5km from the town of Clewer to the south east and within 1km from the EVRAZ Highveld Steel works to the north-west. Two portions of land were selected as being technically and environmentally suitable for the siting of the power station and the ash disposal facility based on the outcomes of the EIA process. Site 1 will be used for the construction and operation of the 55MW power plant.

The main infrastructure that is required for the Transalloys coal-fired power station includes:

- » Power plant production unit/s (boilers / furnaces, turbines, generator and associated equipment, control room).
- » Ash disposal facility and runoff ponds.
- » Dams for storage and separation of "clean" and "dirty" water.
- » Raw water pipeline.
- » Coal and limestone offloading and storage areas.
- » Ash silos.
- » Facility conveyor belts.
- » Water and wastewater treatment facilities and raw water reservoir.
- » Evaporation pond.
- » A 33kV overhead power line from the switchyard to connect into the existing Transalloys Substation.
- » General and hazardous waste storage area.
- » Internal access roads.

Layout plans are attached to Appendix A.



**Figure 1.1:** Locality map showing the proposed area for the establishment of the Transalloys Coal-Fired Power Station, Mpumalanga Province

## 1.1. Activities and Components associated with the Power Station

### 1.1.1 Construction of a Coal-Fired Power Station

Construction of the proposed coal-fired power station is expected take up to 42 months. The construction activity involves the following<sup>1</sup>:

- » Prior to initiating construction, surveys of areas to be occupied by the power station, the ash disposal facility, the on-site substation, the water supply pipeline servitude will be undertaken;
- » Access roads will need to be established to the plant and ash disposal facility from the main Transalloys access road;
- » Site preparation activities will include clearance of vegetation and excavations for foundations. These activities will require the stripping of topsoil, which will need to be stockpiled, backfilled and/or spread on site;
- » Thereafter civil works will take place which will involve concrete works for foundations, the production unit (which houses the turbines, generator etc.), stacks, cooling towers (if applicable), substation and associated infrastructure;
- » Mechanical and electrical work will then follow;
- » The components for the proposed power plant will be transported to site by road. Some of the power station components may be defined as abnormal loads in terms of the Road Traffic Act (Act No. 29 of 1989)<sup>2</sup> by virtue of the dimensional limitations (i.e. length and weight). Components of various specialised construction and lifting equipment are required and will need to be transported to site. In addition, typical civil engineering construction equipment will need to be brought to the site (e.g. excavators, trucks, graders, compaction equipment, cement trucks, etc.)
- » Ancillary infrastructure such as office buildings, the water supply pipeline and a power line linking to the electricity transmission grid will be established
- » Laydown and storage areas will be required for the typical construction equipment which will be required on site.
- » As construction is completed in an area, and as all construction equipment is removed from the site, the affected areas will be rehabilitated where practical and reasonable.

### 1.1.2 Operation of a Coal-Fired Power Station

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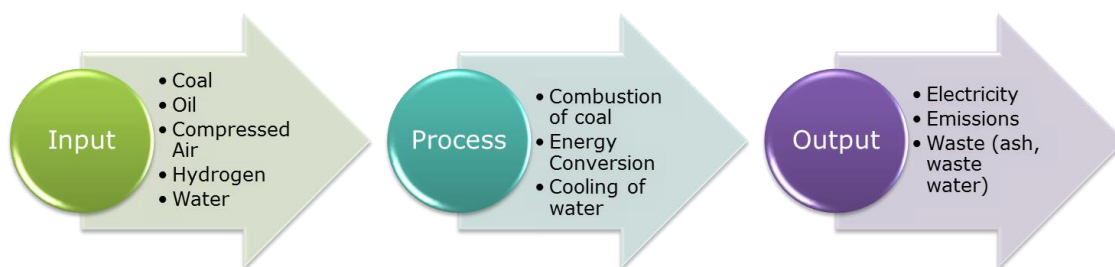
<sup>1</sup>[http://www.eskom.co.za/live/monster.php?URL=%2Fcontent%2FCO\\_0003BuildCoalPSRev4.pdf&Src=Item+28](http://www.eskom.co.za/live/monster.php?URL=%2Fcontent%2FCO_0003BuildCoalPSRev4.pdf&Src=Item+28)).

<sup>2</sup> A permit will be required for the transportation of these abnormal loads on public roads.

Prior to the operation of the power station, testing and trials will need to be undertaken. The proposed facility will create approximately 86 permanent employment positions that will be retained for ~30 years, amongst the following broad categories:

- » Operations – 32 staff
- » Technical services – 44 staff
- » Administration – 10 staff

It is anticipated that there will be full time security, maintenance and control room staff required at the site. In order to operate a coal-fired power station, resources are required (input), and processes and outputs occur from the electricity generation process. This concept is outlined in **Figure 1.2**.



**Figure 1.2:** Resources (input), processes and outputs (waste) for a coal-fired power station

**Figure 1.2** illustrates that in order to operate a coal-fired power station, natural resources such as coal and water will be required. For combustion coal and air are required. Water is required in the power generation process – it is converted to steam for energy conversion (from thermal energy to mechanical energy). Water is also used for cooling in a power station. The output of the process is electricity as well as waste and by-products. The power station will operate for 24 hours a day and 7 days a week.

### ***1.1.3 Decommissioning of a Coal-Fired Power Station***

The lifespan of the proposed coal-fired power station is more than 25 years. Equipment associated with this facility would only be decommissioned once it has reached the end of its economic life. It is most likely that decommissioning activities of the infrastructure of the facility discussed in this EIA would comprise the disassembly and disposal of the infrastructure. Decommissioning activities will involve disassembly of the production units and ancillary infrastructure, demolishing of buildings, removal of hazardous waste and rehabilitation of the ash disposal facility and site.

## 1.2 Findings of the Environmental Impact Assessment

Environmental impacts associated with the construction and operation of the power station and associated infrastructure relate to:

- » Ecological impacts;
  - » Agricultural and land-use impacts;
  - » Impacts on surface water resources including watercourses and wetlands;
  - » Impacts on groundwater resources;
  - » Air quality impacts from the proposed power station and ash disposal facility;
  - » Noise impacts;
  - » Visual impacts;
  - » Traffic impacts;
  - » Social impacts;
  - » Cumulative impacts for all of the above.
- » ***Biodiversity impacts*** associated with the construction of the power station and associated infrastructure. While most of the expected impacts associated with this development to the actual footprint will be unavoidable, the success of mitigation will be determined by the success of preventing impacts from spreading outside the footprints of the development. Aspects such as infestation of surrounding habitat by alien and invasive species, the introduction of non-endemic and invasive animals, dust, effluents, contamination, hydro-carbons spillages, etc. will represent the ultimate challenge of the environmental management plan as these aspects will cause the spread and exacerbation of impacts into the natural environment caused by the development. The major objective of the environmental management programme of the development should therefore be the complete prevention and containment of any impact from the development that might cause harm to areas of surrounding natural habitat, with particular emphasis on avoiding or limiting impacts as far as possible on the aquatic environment (i.e. the Brugspruit and its western tributary as well as the wetlands in the area).

Ultimately, the expected loss of natural resources from the site and immediate surrounds as a result of the development will result in impacts of low significance and will be highly localised. No protected plant and animal species were identified in the study area which will be adversely affected by the proposed project.

Impacts of a cumulative nature, although estimated to result in moderate and low significance, represent a continuous, low level threat to biodiversity on a local and regional scale. The increase in industrial and mining activity in the region implies constant losses of natural habitat and species. This is exacerbated by the decline in environmental quality caused by peripheral and indirect impacts such as species

invasion, degradation, contamination, disruption of ecological processes, habitat fragmentation and isolation, etc.

In conclusion however, no specific impact was identified that would render the proposed development as an unacceptable threat to the biological environment or any specific aspect or species that are known to occur, or could potentially occur within the study area or required servitudes, provided that detailed, comprehensive and sensible environmental management principles are applied throughout the lifetime of the operation.

- » **Impacts on Soils and Agricultural Potential** associated with the construction phase (soil loss and erosion) and the operational phase (permanent loss of agricultural land). The development of the power station will have **low to medium negative impact** on agricultural resources and productivity. The significance of all agricultural impacts is influenced by the fact that the land potential is limited due to soil depth and moisture holding constraints and pressures in terms of mining use. Erosion potential could increase in areas disturbed on the site during construction unless appropriate mitigation is implemented. Impacts in this regard are however expected to be of **low significance**.
  
- » **Impacts on Surface and Groundwater Resources** related to construction and operation of the power station. Impacts on water resources are related to quality and quantity. Impacts on water quantity are not expected as water is not proposed to be abstracted from a natural resource in the area, but will rather be obtained from nearby industrial water users with a water surplus. As proposed for the project, the implementation of dry cooling and dry ashing is the preferred technology in order to minimise water required thereby reducing impacts on water resources. Impacts on water quality relate to sedimentation and contamination during both the construction and operational phases of the project. These impacts can be successfully managed through the implementation of appropriate mitigation and management measures, such as liners for the ash disposal facility and coal stockpile areas, and implementation of dust suppression measures on exposed surfaces. Impacts on water resources are expected to be of **Medium to Low significance**. On-going water quality monitoring throughout the operational phase is required to be undertaken.

**Impacts on wetlands** associated with the construction of the power station and associated infrastructure. Five wetlands were identified in the study area of the valley bottom (associated with the Brugspruit) and hillslope seepage variety. While a significant impact is expected over a section of hillslope seepage wetland identified on the project site for the siting of the ash disposal facility (for the 150MW design alternative), the loss of the wetland was deemed to constitute acceptable loss, due to the degraded present ecological state of the wetland and the opportunity to

rehabilitate other nearby wetlands of conservation value as a mitigating condition of the project. The overall impact on the wetland proposed to be lost to development will however remain **High significance**. This impact is in itself mitigated by the development of the 55MW design alternative, which does not require the siting of the ash disposal facility within delineated wetland systems.

- » **Impacts on air quality and human health** associated with the construction phase (dust) and the operational phase (emissions from the power station and PM from the ash disposal facility). The area is dominated by winds from the east and east-south-east. Impacts associated with the construction phase will be limited largely to the Transalloys smelter complex with no exceedances at the air quality sensitive receptors. Impacts are expected to be of **low significance**. Impacts during operation relate to dust from the ash disposal facility and coal stockpile as well as emissions (SO<sub>2</sub>, NO<sub>2</sub> and PM<sub>10</sub>) from the power station. From the results of the modelling undertaken, the release of PM<sub>2.5</sub>, PM<sub>10</sub> and NO<sub>2</sub> during the operational phase are expected to result in exceedances of both long term (annual) and short term (1-hour and/or 24-hour) ambient air quality criteria off-site. Furthermore, dustfall as a result of unmitigated PM emissions is expected to exceed the criteria for residential areas at the closest residences of Clewer. Impacts are expected to be of **medium significance** when unmitigated for all emissions. Development of the 55MW design alternative are unlikely to result in adverse air quality impacts at the identified receptors.
- » **Noise impacts** associated with the construction (short-term) and operational (long-term) phases. Impacts are expected to be more significant during the night (22:00 – 06:00) than during the daytime (i.e. 06:00 – 22:00). Impacts during the construction phase are expected to be of **low significance** while impacts during the operational phases are also considered to be of **low significance** due to the existing ambient noise conditions. No mitigation or routine noise monitoring is therefore required in the operation phase of the facility.
- » **Visual impacts** associated with the 150MW power station and associated infrastructure. Potential visual impacts are expected to be of **Medium significance** and mostly restricted to within 10km of the site. The consolidation of the proposed infrastructure in areas of existing visual disturbance is however preferred (as proposed by the current siting and layout arrangements), rather than the distribution thereof over larger areas. The visual impact is further mitigated if the 55MW design alternative is developed resulting in a much reduced visual profile of the project.
- » **Impacts on Heritage Sites** during the construction phase. A cemetery, two initiation sites and the demolished remains of structures were identified during the heritage survey, of which the latter are not considered to be of heritage significance.



The cemetery and initiation sites will not be impacted by construction activities. Impacts to the heritage environment are considered to be of **low significance**. From an archaeological point of view there is no reason why the development should not proceed.

- » **Traffic impacts** associated with construction and operation of the power station. The traffic volumes generated by the proposed Transalloys Power Station development will have an additional impact on the external road network. The potential impact is considered to vary significantly between the 55MW and 150MW design alternatives. However road improvements are expected to be required irrespective of whether the proposed development continues or not in order to address access and safety provisions. Furthermore the onus is on the relevant roads authorities to address the recommended road improvements. It is expected that this will be done in light of the number of proposed mining projects in the area. It is recommended that Transalloys engage the traffic authorities in order to determine expectations in this regard.
  
- » **Socio-economic impacts** expected during both the construction and operation phases of the proposed project. The construction and operation of the power station is expected to have both negative and positive social and economic effects. From a socio-economic perspective, the positive effects in terms of construction, operation, and decommissioning of the coal-fired power plant include an increase in national electricity capacity (or relief to the Eskom grid), economic development, job creation, increase in household income, and government revenue.

The town of Clewer is the most directly affected social receptor which will be the most prone to impacts arising from air quality, noise and visual impacts. These impacts are expected to be mitigated to a large extent through the development of the 55MW design alternative over the 150MW design alternative.

Considering that many of the negative impacts will also be possible to mitigate, although not completely eliminate, the trade-offs between negative and positive effects suggest that from the socio-economic perspective the project should be approved for development. It will contribute to achieving local and national government developmental objectives at a relatively limited cost. Nonetheless, it is imperative that the construction, operation, and decommissioning of the project should be conducted in the most sustainable way with the primary objective of minimising, and where feasible, completely eliminating the potential for deterioration of human livelihoods, reducing business turnover, and altering the environment in the proposed area.

- » **Cumulative impacts:** Transalloys is situated in the Highveld Energy Hub Area (Zone A) according to the Environmental Management Framework for the Olifants

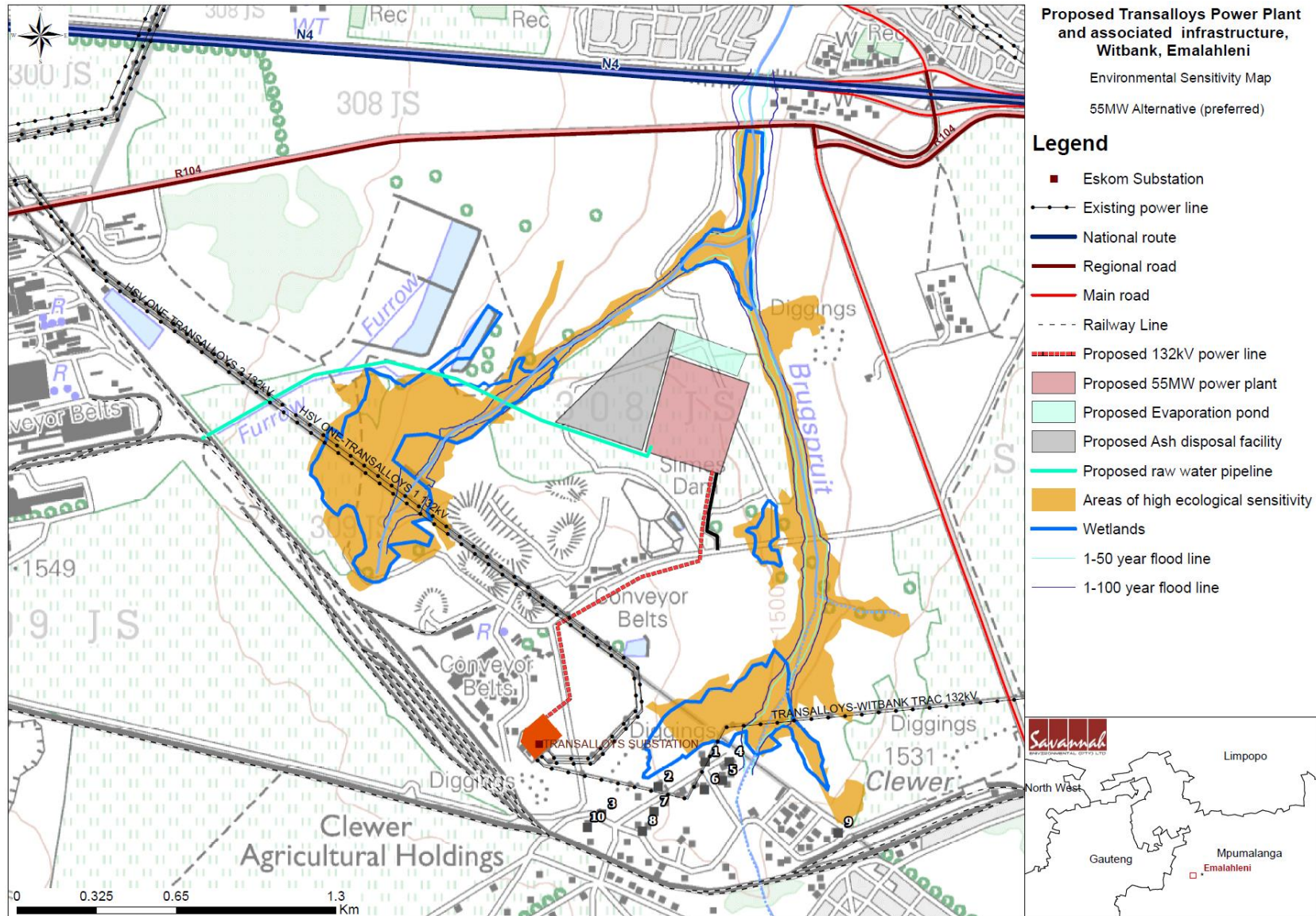
and Letaba River Catchment Areas (OLEMF), which describes this zone as representing the current "powerhouse" of South Africa, housing extensive coal fields, numerous large coal mines, coal-fired power stations and several major industries and towns that are located in the area.

- » The proposed Transalloys power station site is situated near to the following industrial / mining facilities:
- The existing Transalloys siliconmanganese smelter complex (adjacent)
  - Evraz Highveld Steel and Vanadium which is a producer of steel and vanadium products (within 2km).
  - The proposed Anglo Coal Landau Colliery Life Extension Project (new pits within 1km west of Transalloys)
  - The proposed Izazi Colliery on Portions 26, 36, 37 and a portion of portion 46 of the farm Elandsfontein 309 JS (within 1km east of Transalloys).
  - A proposed colliery on Portion 25 of the farm Elandsfontein 309 JS (within 1km east of Transalloys).
  - The existing AngloAmerican Landau Colliery (within 5km to the south-east)
  - The proposed Khanyisa Coal Fired Power Station (450MW) within the South African Coal Estates Complex (including the Greenside, Kleinkopje and Landau Collieries).
  - Existing power stations including the soon to be operational Eskom Kusile Power Station situated less than 20km to the west and the Eskom Duvha Power Station within 22km to the south-east.

The development of the proposed Transalloys Power Plant along with the development of the abovementioned projects will have negative and positive cumulative environmental, social and economic impacts. It is essential that each new coal-fired power station and related coal-developments (such as new coal mines) subscribe to sound environmental management during these projects life-cycle (construction, operation, decommissioning and rehabilitation phases). This would require input from regulating authorities and applicants during the development of coal and power station projects in the region to ensure that cumulative environmental impacts are managed to acceptable levels.

- » ***Impacts associated with waste treatment and management activities:*** Impacts associated with waste treatment and management activities relate to those associated with the ash disposal facility and the wastewater treatment works. Potential impacts on surface and groundwater are anticipated should appropriate mitigation measures not be implemented. In terms of the assessment of impacts undertaken within this EIA study, Impacts on water resources are expected to be of **Medium to Low significance**. On-going water quality monitoring throughout the operational phase is required to be

undertaken. In addition, an appropriate Integrated Water and Waste Management Plan (IWWMP) and Stormwater Management Plan must be developed and implemented for all phases of the proposed project.



**Figure 1.3:** Environmental Sensitivity Map overlay of 55MW power plant alternative (preferred)

## PURPOSE AND OBJECTIVES OF THE EMPr

## CHAPTER 2

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.”<sup>3</sup> 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 the Transalloys Coal-Fired Power Station. This EMPr 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:

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<sup>3</sup> Provincial Government Northern Cape, Department of Environmental Affairs and Development Planning: *Guideline for Environmental Management Plans*. 2005

- » 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 the Transalloys Coal-Fired Power Station, 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.

## KEY LEGISLATION APPLICABLE TO THE DEVELOPMENT

## CHAPTER 3

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The following legislation and guidelines have informed the scope and content of this EMPr:

- » National Environmental Management Act (Act No 107 of 1998).
- » EIA Regulations, published under Chapter 5 of the NEMA (GNR543, GNR544, GNR545, and GNR546 in Government Gazette 33306 of 18 June 2010).
- » Guidelines published in terms of the NEMA EIA Regulations, in particular:
  - \* Companion to the National Environmental Management Act (NEMA) Environmental Impact Assessment (EIA) Regulations of 2010 (Draft Guideline; DEA, 2010).
  - \* Public Participation in the EIA Process (DEA, 2010).
- » International guidelines – the Equator Principles

Several other Acts, Standards, or guidelines have also informed the EIA and this EMPr. Table 3.1 provides the relevant South African environmental legislation applicable to the project in terms of environmental quality.

**Table 3.1:** Relevant legislative permitting requirements applicable to the proposed Transalloys Coal-Fired Power Station

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
<b>National Legislation</b>			
National Environmental Management Act (Act No 107 of 1998)	<p>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.</p> <p>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.</p> <p>In terms of GN R543, R544, R545 and R546 of 18 June 2010, a Scoping and EIA Process is required to be undertaken for the proposed project.</p>	Department of Environmental Affairs – competent authority  Mpumalanga DEDET – commenting authority	<p>The listed activities triggered by the proposed project have been identified and assessed in the EIA process being undertaken (i.e. Scoping and EIA).</p> <p>This EIA Report will be submitted to the competent and commenting authority in support of the application for authorisation.</p>
National Environmental Management Act (Act No 107 of 1998)	<p>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.</p> <p>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.</p>	Department of Environmental Affairs	<p>While no permitting or licensing requirements arise directly by virtue of the proposed project, this section has found application during the EIA Phase through the consideration of potential impacts (cumulative, direct, and indirect). It will continue to apply throughout the life cycle of the project.</p>
Environment Conservation Act (Act	National Noise Control Regulations (GN R154 dated	Department of	Noise impacts are expected to be



Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
No 73 of 1989)	10 January 1992)	Environmental Affairs  Mpumalanga DEDET  Local Authorities	<p>associated with the construction phase of the project and are not likely to present a significant intrusion to the local community. Therefore is no requirement for a noise permit in terms of the legislation.</p> <p>On-site activities should be limited to 6:00am - 6:00pm, Monday – Saturday (excluding public holidays).</p> <p>Should activities need to be undertaken outside of these times, the surrounding communities will need to be notified and appropriate approval will be obtained from DEA and the Local Municipality.</p>
National Water Act (Act No 36 of 1998)	<p>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).</p> <p>Consumptive water uses may include the taking of water from a water resource and storage - Sections 21a and b, however these are not anticipated.</p> <p>Non-consumptive water uses may include impeding</p>	Department of Water Affairs	<p>The following Section 21 water uses have been identified for the proposed project, in terms of which a Water Use License will be required:</p> <ul style="list-style-type: none"> <li>» 21(b) storing water;</li> <li>» 21(c) impeding or diverting the flow of water in a watercourse;</li> </ul>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>or diverting of flow in a water course - Section 21c; and altering of bed, banks or characteristics of a watercourse - Section 21i.</p>		<ul style="list-style-type: none"> <li>» 21(g) disposing of waste in a manner which may detrimentally impact on a water resource;</li> <li>» 21(i) altering the bed, banks, course or characteristics of a watercourse</li> </ul>
<p>Minerals and Petroleum Resources Development Act (Act No 28 of 2002)</p>	<p>A mining permit or mining right may be required where a mineral in question is to be mined (e.g. materials from a borrow pit) in accordance with the provisions of the Act.</p> <p>Requirements for Environmental Management Programmes and Environmental Management Plans are set out in S39 of the Act.</p> <p>S53 Department of Mineral Resources: Approval from the Department of Mineral Resources (DMR) may be required to use land surface contrary to the objects of the Act in terms of section 53 of the Mineral and Petroleum Resources Development Act, (Act No 28 of 2002): In terms of the Act approval from the Minister of Mineral Resources is required to ensure that proposed activities do not sterilise a mineral resource that might occur on site.</p>	<p>Department of Mineral Resources</p>	<p>As no borrow pits are expected to be required for the construction of the facility, no mining permit or right is required to be obtained.</p> <p>Anglo Coal has mining rights over sections of land owned by Transalloys. A Section 53 application is required to be submitted to the DMR. No objections to the siting of the proposed project components within the mining right area we received based on discussions with Anglo Coal.</p>
<p>National Environmental Management: Air Quality Act (Act</p>	<p>S21 – Listed activities requiring an Air Emissions License.</p>	<p>Department of Environmental Affairs</p>	<p>Solid fuel combustion installations using solid fuel for electricity</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
No 39 of 2004)	<p>Minimum emission standards are set for Listed Activities. The minimum emission standards are defined for existing and new plants in Government Notice 893 of 22 November 2013.</p> <p>Measures in respect of dust control (S32) and National Dust Control Regulations of November 2013.</p> <p>Measures to control noise (S34) - no regulations promulgated yet.</p> <p>The Act provides that an air quality officer may require any person to submit an atmospheric impact report if there is reasonable suspicion that the person has failed to comply with the Act.</p>		<p>generation are Listed Activities (Category 1: Sub-category 1.1) in term of Section 21 of the NEM:AQA. Therefore an Air Emissions License must be obtained for the project.</p> <p>Measures in respect of dust control (S32) and the National Dust Control Regulations of November 2013.</p>
National Heritage Resources Act (Act No 25 of 1999)	<ul style="list-style-type: none"> <li>» Stipulates assessment criteria and categories of heritage resources according to their significance (S7).</li> <li>» Provides for the protection of all archaeological and palaeontological sites, and meteorites (S35).</li> <li>» Provides for the conservation and care of cemeteries and graves by SAHRA where this is not the responsibility of any other authority (S36).</li> <li>» Lists activities which require developers any person who intends to undertake to notify the</li> </ul>	South African Heritage Resources Agency	An HIA has been undertaken as part of the EIA Process to identify heritage sites. No heritage sites have been identified which will be disturbed during construction.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>responsible heritage resources authority and furnish it with details regarding the location, nature, and extent of the proposed development (S38).</p> <ul style="list-style-type: none"> <li>» Requires the compilation of a Conservation Management Plan as well as a permit from SAHRA for the presentation of archaeological sites as part of tourism attraction (S44).</li> </ul>		
<p>National Environmental Management: Biodiversity Act (Act No 10 of 2004)</p>	<ul style="list-style-type: none"> <li>» Provides for the MEC/Minister to identify any process or activity in such a listed ecosystem as a threatening process (S53)</li> <li>» A list of threatened and protected species has been published in terms of S 56(1) - Government Gazette 29657.</li> <li>» Three government notices have been published, i.e. GN R 150 (Commencement of Threatened and Protected Species Regulations, 2007), GN R 151 (Lists of critically endangered, vulnerable and protected species) and GN R 152 (Threatened or Protected Species Regulations).</li> <li>» Provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), vulnerable (VU) or protected. The first national list of threatened terrestrial ecosystems has been gazetted, together with supporting information on the listing process including the purpose and rationale for listing ecosystems, the criteria used to identify listed ecosystems, the</li> </ul>	<p>Department of Environmental Affairs</p>	<p>Under this Act, a permit would be required for any activity which is of a nature that may negatively impact on the survival of a listed protected species.</p> <p>An ecological study has been undertaken as part of the EIA Phase. As such the potentially occurrence of critically endangered, endangered, vulnerable, and protected species and the potential for them to be affected has been considered.</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>implications of listing ecosystems, and summary statistics and national maps of listed ecosystems (National Environmental Management: Biodiversity Act: National list of ecosystems that are threatened and in need of protection, (G 34809, GN 1002), 9 December 2011).</p> <p>» This Act also regulates alien and invader species.</p>		
<p>Conservation of Agricultural Resources Act (Act No 43 of 1983)</p>	<p>» Prohibition of the spreading of weeds (S5)</p> <p>» Classification of categories of weeds &amp; invader plants (Regulation 15 of GN R1048) &amp; restrictions in terms of where these species may occur.</p> <p>» Requirement &amp; methods to implement control measures for alien and invasive plant species (Regulation 15E of GN R1048).</p>	<p>Department of Agriculture</p>	<p>This Act will find application throughout the life cycle of the project. In this regard, soil erosion prevention and soil conservation strategies must be developed and implemented. In addition, a weed control and management plan must be implemented.</p> <p>The permission of agricultural authorities will be required if the Project requires the draining of vleis, marshes or water sponges on land outside urban areas. The siting of the ash disposal facility could potentially require such consent.</p>
<p>National Forests Act (Act No. 84 of 1998)</p>	<p>According to this Act, the Minister may declare a tree, group of trees, woodland or a species of trees</p>	<p>National Department of Forestry</p>	<p>A licence is required for the removal of protected trees. The</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>as protected. The prohibitions provide that 'no person may cut, damage, disturb, destroy or remove any protected tree, or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister'.</p>		<p>presence of protected trees on the site was determined through the ecological impact assessment undertaken for the project.</p>
<p>National Veld and Forest Fire Act (Act 101 of 1998)</p>	<p>In terms of S21 the applicant 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.</p> <p>In terms of S17, the applicant must have such equipment, protective clothing, and trained personnel for extinguishing fires.</p>	<p>Department of Agriculture, Forestry and Fisheries (DAFF)</p>	<p>While no permitting or licensing requirements arise from this legislation, this Act will find application during the construction and operational phase of the project.</p>
<p>Hazardous Substances Act (Act No 15 of 1973)</p>	<p>This Act regulates the control of substances that may cause injury, or ill health, or death due to their toxic, corrosive, irritant, strongly 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.</p> <p>Group I and II: Any substance or mixture of a</p>	<p>Department of Health</p>	<p>It is necessary to identify and list all the Group I, II, III, and IV hazardous substances that may be on the site and in what operational context they are used, stored or handled. If applicable, a license is required to be obtained from the Department of Health.</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>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.</p>		
<p>Development Facilitation Act (Act No 67 of 1995)</p>	<p>Provides for the overall framework and administrative structures for planning throughout the Republic.</p> <p>S (2-4) provide general principles for land development and conflict resolution.</p>	<p>Local Municipality</p>	<p>The applicant must submit a land development application in the prescribed manner and form as provided for in the Act. A land development applicant who wishes to establish a land development area must comply with procedures set out in the Act.</p>
<p>National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)</p>	<p>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.</p> <p>The Minister may amend the list by –</p> <ul style="list-style-type: none"> <li>» Adding other waste management activities to the list.</li> <li>» Removing waste management activities from the list.</li> <li>» Making other changes to the particulars on the</li> </ul>	<p>National Department of Water and Environmental Affairs (hazardous waste)</p> <p>Provincial Department of Environmental Affairs (general waste)</p>	<p>A waste license is required for the disposal of wwaste to land (ash) and for the construction of the ash disposal facility associated with the power station.</p> <p>General waste handling, storage and disposal during construction and operation is required to be undertaken in accordance with the requirements of the Act, as</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>list.</p> <p>In terms of the Regulations published in terms of this Act (GN 912), a Basic Assessment or Environmental Impact Assessment is required to be undertaken for identified listed activities.</p> <p>Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that:</p> <ul style="list-style-type: none"> <li>» The containers in which any waste is stored, are intact and not corroded or in</li> <li>» any other way rendered unfit for the safe storage of waste.</li> <li>» Adequate measures are taken to prevent accidental spillage or leaking.</li> <li>» The waste cannot be blown away.</li> <li>» Nuisances such as odour, visual impacts and breeding of vectors do not arise; and</li> <li>» Pollution of the environment and harm to health are prevented.</li> </ul>		<p>detailed in the EMPs for each Phase. The DWAF (1998) Waste Management Series. Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste will also need to be considered.</p>
Subdivision of Agricultural Land Act (Act No 70 of 1970)	Details land subdivision requirements and procedures. Applies for subdivision of all agricultural land in the country	Department of Agriculture	Subdivision of land may be required in terms of S24 and S17 of the Act.
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	» South African National Roads Agency Limited (national roads)	An abnormal load/vehicle permit may be required to transport the various components to site for construction. These include route



Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>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.</p> <ul style="list-style-type: none"> <li>» 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.</li> <li>» 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.</li> </ul>	<p>» Provincial Department of Transport</p>	<p>clearances and permits will be required for vehicles carrying abnormally heavy or abnormally dimensioned loads. Transport vehicles exceeding the dimensional limitations (length) of 22m. Depending on the trailer configuration and height when loaded, some of the power station components may not meet specified dimensional limitations (height and width).</p>
<b>Provincial Legislation</b>			
<p>Mpumalanga Nature Conservation Act 10 of 1998</p>	<p>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.</p>	<p>Mpumalanga Department of Economic Development, Environment and Tourism</p>	<p>A collection/destruction permit A collection/destruction permit must be obtained from MDEDET for the removal of any protected plant or animal species found on site. Additionally, a permit for the disturbance or destruction of indigenous species must be applied for.</p>

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	<p>Amongst other regulations, the following may apply to the current project:</p> <ul style="list-style-type: none"> <li>» Boundary fences may not be altered in such a way as to prevent wild animals from freely moving onto or off of a property;</li> <li>» Aquatic habitats may not be destroyed or damaged;</li> <li>» The owner of land upon which an invasive species is found (plant or animal) must take the necessary steps to eradicate or destroy such species.</li> </ul> <p>The Act provides lists of protected species for the Province.</p>		

## STRUCTURE OF THIS EMPR

## CHAPTER 4

The first two chapters provide background to the EMPr and the proposed project, while the chapters which follow consider the following:

- » Pre-Construction (Planning & Design) activities;
- » Construction activities;
- » Operation activities; and
- » Decommissioning activities.

These chapters set out the procedures necessary for Transalloys, and its EPC Partner, to minimise environmental impacts and achieve environmental compliance. For each of the phases of implementation, an over-arching environmental **goal** is stated. In order to meet this goal, a number of **objectives** are listed. The EMPr has been structured in table format in order to show the links between the goals for each phase and their associated objectives, activities/risk sources, mitigation actions, monitoring requirements and performance indicators. A specific EMPr table has been established for each environmental objective. The information provided within the EMPr table for each objective is illustrated below:

**OBJECTIVE: Description of the objective, which is necessary to meet the overall goals; which take into account the findings of the EIA specialist studies**

<b>Project Component/s</b>	» List of project components affecting the objective.
<b>Potential Impact</b>	» Description of potential environmental impact if objective is not met.
<b>Activity/Risk Source</b>	» Description of activities which could affect achieving objective.
<b>Mitigation: Target/Objective</b>	» Description of the target and/or desired outcomes of mitigation.

<b>Mitigation: Action/Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
List specific action(s) required to meet the mitigation target/objective described above.	Who is responsible for the measures?	Periods for implementation.

<b>Performance Indicator</b>	Description of key indicator(s) that track progress/indicate the effectiveness of the EMPr.
<b>Monitoring</b>	Mechanisms for monitoring compliance; the key monitoring actions required to check whether the objectives are being achieved, taking into consideration responsibility, frequency, methods, and reporting.

The objectives and EMPr tables are required to be reviewed and possibly modified whenever changes, such as the following, occur:

- » Planned activities change (i.e. in terms of the components and/or layout of the facility);
- » Modification to or addition to environmental objectives and targets;
- » Relevant legal or other requirements are changed or introduced; and
- » Significant progress has been made on achieving an objective or target such that it should be re-examined to determine if it is still relevant or should be modified.

#### 4.1 Project Team

This draft EMPr was compiled by:

- » Steven Ingle: holds a Bachelors degree in Environmental Management and over 8 years of experience in environmental impact assessment and planning. He has undertaken numerous EIAs for large-scale infrastructure projects and associated infrastructure in South Africa.
- » Jo-Anne Thomas, is a registered Professional Natural Scientist (in the practice of environmental science) with the South African Council for Natural Scientific Professions. She has gained extensive knowledge and experience on potential environmental impacts associated with electricity generation and transmission projects through her involvement in related EIA processes over the past sixteen (16) years. She has successfully managed and undertaken EIA processes for electricity generation projects throughout South Africa.

Specialists involved in the preparation of management measures include:

<b>Specialist</b>	<b>Area of Expertise</b>
Gerhard Botha with peer review by Marianne Strohbach	Ecological
Johann Lanz	Soils and agricultural potential
Airshed Planning Professionals	Air Quality
M2 Environmental Connections	Hydrology and Aquatic Bio-Monitoring
M2 Environmental Connections	Wetlands
Jones and Wagener	Geohydrology
Enviro Acoustic Research	Noise

<b>Specialist</b>	<b>Area of Expertise</b>
MetroGIS	Visual
Heritage Contracts and Archaeological Consulting CC	Heritage
Tony Barbour	Social
Malani Padayachee & Associates	Traffic

The Savannah Environmental team have extensive knowledge and experience in EIAs and environmental management, having been involved in EIA processes over the past fifteen years. They have managed and drafted EMPs for other power generation projects throughout South Africa.

## ROLES AND RESPONSIBILITIES

## CHAPTER 5

### 5.1 Roles and Responsibilities for the Construction Phase of the Coal - Fired Power Station

As the Proponent, Transalloys (Pty) Ltd and his EPC must ensure that the implementation of the Power Station complies with the requirements of any and all environmental authorisations and permits, and obligations emanating from other relevant environmental legislation. This obligation is partly met through the development of the EMPr, and the implementation of the EMPr through its integration into the contract documentation. Transalloys will retain various key roles and responsibilities during the construction of the Coal-fired Power Station. These are outlined below.

Specific responsibilities of the Owner's Representatives; Environmental Control Officer and EPC Contractor for the construction phase of this project are as detailed below.

The **Project Manager** will:

- » Ensure all specifications and legal constraints specifically with regards to the environment are highlighted to the Contractor(s) so that they are aware of these.
- » Ensure that its Contractors are made aware of all stipulations within the EMPr.
- » Ensure that the EMPr is correctly implemented throughout the project cycle by means of site inspections and meetings. This will be documented as part of the site meeting minutes.
- » Be fully conversant with the Environmental Impact Assessment for the project, the EMPr, the conditions of the Environmental Authorisation, and all relevant environmental legislation.

The **Site Manager** (On-site Representative) will:

- » Be fully knowledgeable with the contents of the Environmental Impact Assessment.
- » Be fully knowledgeable with the contents and conditions of the Environmental Authorisation.
- » Be fully knowledgeable with the contents of the EMPr.
- » Be fully knowledgeable with the contents of all relevant environmental legislation, and ensure compliance with these.
- » Be fully knowledgeable with the contents of all relevant licences and permits.
- » Have overall responsibility of the EMPr and its implementation.
- » Conduct audits to ensure compliance to the EMPr.
- » Ensure there is communication with the Project Manager, the Environmental Control Officer/s and relevant discipline Engineers on matters concerning the environment.
- » Ensure that no actions are taken which will harm or may indirectly cause harm to the environment, and take steps to prevent pollution on the site.

- » Confine activities to the demarcated construction site.

An independent **Environmental Control Officer (ECO)** must be appointed by the project proponent prior to the commencement of any authorised activities. The ECO will be responsible for monitoring, reviewing and verifying compliance by the Contractor with the environmental specifications of the EMPr and the conditions of the Environmental Authorisation. The ECO will:

- » Be fully knowledgeable of the contents with the Environmental Impact Assessment.
- » Be fully knowledgeable of the contents with the conditions of the Environmental Authorisation (once issued).
- » Be fully knowledgeable of the contents with the EMPr.
- » Be fully knowledgeable of the contents with all relevant environmental legislation, and ensure compliance with them.
- » Be fully knowledgeable of all the licences and permits issued to the site.
- » Ensure that the contents of this document are communicated to the Contractor site staff and that the Site Manager and Contractor are constantly made aware of the contents through discussion.
- » Ensure that the compliance of the EMPr is monitored through regular and comprehensive inspection of the site and surrounding areas.
- » Ensure that the Site Manager has input into the review and acceptance of construction methods and method statements.
- » Ensure that activities on site comply with all relevant environmental legislation.
- » Ensure that a removal is ordered of any person(s) and/or equipment responsible for any contravention of the specifications of the EMPr.
- » Ensure that any non-compliance or remedial measures that need to be applied are reported.
- » Keep record of all activities on site, problems identified, transgressions noted and a task schedule of tasks undertaken by the ECO.
- » Independently report to DEA in terms of compliance with the specifications of the EMPr and conditions of the Environmental Authorisation (once issued).
- » Keep record of all reports submitted to DEA.

The ECO shall remain employed until all rehabilitation measures, as required for implementation due to construction damage, are completed and the site handed over for operation.

**Contractors and Service Providers:** All contractors (including sub-contractors and staff) and service providers are ultimately responsible for:

- » Ensuring adherence to the environmental management specifications.

- » Ensuring that Method Statements are submitted to the Site Manager for approval before any work is undertaken. Any lack of adherence to this will be considered as non-compliance to the specifications of the EMPr.
- » Ensuring that any instructions issued by the Site Manager on the advice of the ECO are adhered to.
- » Ensuring that a report is tabled at each site meeting, which will document all incidents that have occurred during the period before the site meeting.
- » Ensuring that a register is kept in the site office, which lists all transgressions issued by the ECO.
- » Ensuring that a register of all public complaints is maintained.
- » Ensuring that all employees, including those of sub-contractors receive training before the commencement of construction in order that they can constructively contribute towards the successful implementation of the EMPr (i.e. ensure their staff are appropriately trained as to the environmental obligations).

**Contractor's Environmental Representative:** The Contractor's Environmental Representative (CER), employed by the Contractor, is responsible for managing the day-to-day on-site implementation of this EMPr, and for the compilation of regular (usually weekly) Monitoring Reports. In addition, the CER must act as liaison and advisor on all environmental and related issues and ensure that any complaints received from the public are duly recorded and forwarded to the Site Manager and Contractor.

The Contractor's Environmental Representative should:

- » Be well versed in environmental matters.
- » Understand the relevant environmental legislation and processes.
- » Understand the hierarchy of Environmental Compliance Reporting, and the implications of Non-Compliance.
- » Know the background of the project and understand the implementation programme.
- » Be able to resolve conflicts and make recommendations on site in terms of the requirements of this Specification.
- » Keep accurate and detailed records of all EMPr-related activities on site.

## **5.2. Roles and Responsibilities for the Operation Phase of the Coal - Fired Power Station**

Formal responsibilities are necessary to ensure that key procedures are executed. Specific responsibilities of Coal-Fired Power Station Operations Manager, and Environmental Manager for the operation phase of this project are detailed below.



The **Power Station Manager** will:

- » Ensure that adequate resources (human, financial, technology) are made available and appropriately managed for the successful implementation of the operational EMPr.
- » Conduct annual basis reviews of the EMPr to evaluate its effectiveness.
- » Take appropriate action as a result of findings and recommendations in management reviews and audits.
- » Provide forums to communicate matters regarding environmental management.

The **Environmental Manager** will:

- » Develop and Implement an Environmental Management System (EMS) for the Power Station and associated infrastructure.
- » Manage and report on the facility's environmental performance.
- » Maintain a register of all known environmental impacts and manage the monitoring thereof.
- » Conduct internal environmental audits and co-ordinate external environmental audits.
- » Liaise with statutory bodies such as the National and Provincial Department of Environmental Affairs (DEA) on environmental performance and other issues.
- » Conduct environmental training and awareness for the employees who operate and maintain the Coal - Fired Power Station.
- » Compile environmental policies and procedures.
- » Liaise with interested and affected parties on environmental issues of common concern.
- » Track and control the lodging of any complaints regarding environmental matters.

**MANAGEMENT PROGRAMME:  
 PRE-CONSTRUCTION**

**CHAPTER 6**

**6.1. Goal for Pre-Construction Activities**

**Overall Goal for Pre-Construction:** Undertake the pre-construction phase (planning and design) of the power station in a way that:

- » Ensures that the design of the power station responds to the identified environmental constraints and opportunities.
- » Ensures that pre-construction activities are undertaken in accordance with all relevant legislative requirements.
- » Ensures that adequate regard has been taken of any landowner concerns and that these are appropriately addressed through design and planning (where appropriate).
- » Ensures that the best environmental options are selected for the project.
- » Enables the power station construction activities to be undertaken without significant disruption to other land uses in the area.

In order to meet this goal, the following objectives have been identified, together with necessary actions and monitoring requirements.

**6.2. Objectives**

**OBJECTIVE 1. : To ensure that the design of the facility responds to the identified environmental constraints and opportunities**

From the specialist investigations undertaken for the proposed power station site, no absolute 'no go' areas were identified. However, a number of potentially sensitive areas were identified to be associated with the proposed project. These areas are illustrated in Figure 1.3.

<b>Project component/s</b>	Project components affecting the objective include all infrastructure including: <ul style="list-style-type: none"> <li>» power station</li> <li>» access roads</li> <li>» substation</li> <li>» power line</li> <li>» water pipeline</li> <li>» ash disposal facility</li> <li>» coal stockpile</li> <li>» wastewater treatment and management facilities</li> </ul>
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<b>Potential Impact</b>	» Design fails to respond optimally to the identified environmental considerations
<b>Activities/risk sources</b>	» Positioning of infrastructure for the power station
<b>Mitigation: Target/Objective</b>	» To ensure that the design of the facility responds to the identified environmental constraints and opportunities

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
<b>General</b>		
1.1. Plan and conduct pre-construction activities in an environmentally acceptable manner	Project Developer	Pre-construction
1.2. Consider design-level mitigation measures recommended in the EIA Report and specialist studies.	Project Developer	Design
<b>Ecology</b>		
1.3. Conduct an ecological walk through survey of the water pipeline servitude. Results of this survey must guide permitting requirements for the removal of protected plants, namely <i>Satyrium longicauda</i> identified during the ecological survey from the selected property.	Suitably qualified person/ specialist appointed by The Project Developer	Planning Phase (prior to construction/ during the detail design phase)
1.4. Develop a biodiversity monitoring programme for implementation during construction and operation	Suitably qualified person/ specialist appointed by The Project Developer	Planning Phase
1.5. Develop a capture and relocation programme for faunal species for implementation during the construction phase	Suitably qualified person/ specialist appointed by The Project Developer	Planning Phase
1.6. Develop an alien and invasive management programme for implementation during construction and operation	Suitably qualified person/ specialist appointed by The Project Developer	Planning Phase
1.7. Develop a rehabilitation programme that makes use of locally endemic species	Suitably qualified person/ specialist appointed by The Project Developer	Planning Phase
<b>Surface water and waste management</b>		
1.8. The ash disposal facility should be lined with appropriately designed liners and/or clays to reduce infiltration and percolation of leachates to the groundwater environment.	Project Developer	Planning Phase
1.9. Develop a stormwater management plan for the stormwater and water pollution control facilities such as Pollution Control Dams and storm water	Suitably qualified person/ specialist appointed by The	Planning Phase

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
drainage system. Pollution control infrastructure to be designed in accordance with Regulation 636 of August 2013.	Project Developer	
1.10. Development of an Integrated Water Resource Management Plan for implementation during construction and operation	Suitably qualified person/ specialist appointed by The Project Developer	Planning Phase
1.11. Diversion of external surface water: A system of storm water drains must be designed for implementation to ensure that all water that falls outside the area of the stockpile and ash dump is diverted clear of the deposit. Provision must be made for the maximum precipitation to be expected over a period of 24 hours with a probability of once in one hundred years. A freeboard of at least 0.5 m must be provided throughout the system above the predicted maximum water level.	Project Developer	Design
1.12. Develop a surface water monitoring programme to monitor impacts on water quality for the operation phase of the power station.	Suitably qualified person/ specialist appointed by The Project Developer	Planning Phase
1.13. Develop a Zero Liquid Effluent Discharge (ZLED) policy for the operation phase of the power station.	Project Developer	Planning Phase
<b>Traffic</b>		
1.14. Develop a traffic management plan for the construction and operational phases of the power station. This is of particular importance should the recommended traffic/intersection improvements not be effected timeously by the appropriate roads authorities.	Suitably qualified person/ specialist appointed by The Project Developer	Planning Phase
1.15. The applicant should engage with the road authorities to further address the issue of road upgrades.	Suitably qualified person/ specialist appointed by The Project Developer	Planning Phase
1.16. Permits for transportation of abnormal loads on public roads must be obtained prior to commencement of construction, if required.	Project Developer	Planning Phase
<b>Air quality</b>		
1.17. Design and implement an air quality management plan for the operational phase of the power station. This should include an emission control and reduction strategy to ensure that the	Suitably qualified person/ specialist appointed by The Project Developer	Planning Phase

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
contribution to ambient concentrations is minimised.		
<b>Heritage</b>		
1.18. The entire cemetery site should be fenced off during construction with an access gate provided for family members.	Suitably qualified person/ specialist appointed by The Project Developer	Planning Phase
<b>Emergency situations</b>		
1.19. Compile a Fire Management Plan for implementation during construction and operation	Suitably qualified person/ specialist appointed by The Project Developer	Planning Phase
1.20. Develop suitable procedures in the event of encountering potentially dangerous animals on the site for implementation during the construction phase.	Suitably qualified person/ specialist appointed by The Project Developer	Planning Phase
<b>Landscaping</b>		
1.21. The services of a landscape architect should be acquired in order to create a master plan for the detailed design and placement of, firstly the power station, and secondly the ancillary infrastructure taking the local vegetation into consideration. Green buffer zones should be planned for at critical areas surrounding the facility. The specialist visual report should be used as a reference to identify such buffer zones.	The Project Developer	Planning Phase
1.22. Plant vegetation barriers along the southern boundary of the ash disposal facility site in order to shield the ash disposal facility, structures and activities from observers residing in the north of Clewer.	Suitably qualified person/ specialist appointed by The Project Developer	Planning Phase
<b>Social</b>		
1.23. During the design and prior to construction the developer should meet with local communities and authorities to determine their concerns and take into consideration any mitigating proposals.	Project Developer	Planning Phase
1.24. Perform a skills audit to determine the potential skills that could be sourced in the area.	Project Developer	Planning Phase
1.25. Develop an apprenticeship programmes to build onto existing or develop new skills of construction workers, especially those coming from the local communities.	Project Developer	Planning Phase
<b>Power line</b>		

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
1.26. Design the power line towers to be bird friendly and plan to implement bird diverters, where required, in accordance with Eskom standards in this regard.	Project Developer	Pre-construction
<b>Layout</b>		
1.27. Plan for consolidating infrastructure as far as possible near to existing impacted areas associated with the smelter complex and make use of already disturbed areas and access roads rather than pristine sites, wherever possible.	Project Developer	Planning Phase
1.28. Submit final layout to DEA for approval prior to commencement of construction. Layout should indicate all areas where infrastructure is planned as well as temporary areas of disturbance during the construction phase (i.e. laydown areas, etc.).	Project Developer	Pre-construction
<b>Other consents</b>		
1.29. Water use to be licensed for appropriate regulation and control. WUL must be obtained prior to commencement of water use.	Project Developer / Consultant	Planning Phase
1.30. Obtain Atmospheric Emissions License from Nkangala District Municipality.	Project Developer / Consultant	Planning Phase
1.31. A Section 53 Application should be submitted to the DoE to ensure that proposed activities do not sterilise a mineral resource that might occur on site	Project Developer	Planning Phase

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» Design and layouts etc. respond to the mitigation measures and recommendations in the EIA report.</li> <li>» Necessary plans and procedures are in place for commencement with construction.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Ensure that the design implemented meets the objectives and mitigation measures in the EIA report through review of the design by the Project Manager and Environmental Control Officer (ECO) prior to the commencement of construction.</li> </ul>

**MANAGEMENT PROGRAMME:  
 CONSTRUCTION**

**CHAPTER 7**

**7.1. Overall Goal for Construction**

**Overall Goal for Construction:** Undertake the construction phase of the coal-fired power station and associated infrastructure in a way that:

- » Ensures that construction activities are properly managed in respect of environmental aspects and impacts.
- » Enables the construction activities to be undertaken without significant disruption to other land uses in the area.
- » Minimises the impact on the environment to be affected by construction activities.
- » Minimises the impact on the archaeological and historical value of the site and where possible adds to the archaeological record of this area.

**7.2. Objectives**

In order to meet the goals for construction, the following objectives have been identified, together with necessary actions and monitoring requirements.

**OBJECTIVE 2. : Site establishment and securing the site**

<b>Project component/s</b>	Construction of all infrastructure including: <ul style="list-style-type: none"> <li>» power station</li> <li>» access roads</li> <li>» substation</li> <li>» water pipeline</li> <li>» power line</li> <li>» ash dump</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Hazards to landowners and public</li> <li>» Security of materials</li> <li>» Substantially increased damage to adjacent sensitive vegetation, due largely to ignorance of these sensitive areas.</li> </ul>
<b>Activities/risk sources</b>	<ul style="list-style-type: none"> <li>» Open excavations (foundations and cable trenches)</li> <li>» Movement of construction vehicles in the area and on-site</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» To secure the site against unauthorised entry</li> <li>» To protect members of the public/landowners/residents</li> </ul>

Mitigation: Action/control	Responsibility	Timeframe
2.1. Secure site, working areas and excavations in an appropriate manner.	Contractor	Duration of Contract
2.2. Where necessary to control access, fence and secure area.	Contractor	Duration of Contract
2.3. Fence and secure Contractor's equipment camp.	Contractor	Duration of Contract
2.4. Minimise vegetation clearance associated with site establishment activities.	Contractor	Site establishment
2.5. All development footprints for permanent and temporary infrastructure should be appropriately demarcated. There is to be no disturbance outside these demarcated areas.	Contractor	Duration of Contract
2.6. Establish the necessary ablution facilities with chemical toilets. Provide adequate sanitary facilities and ablutions for construction workers (1 toilet per every 15 workers) at appropriate locations on site.	Contractor	Duration of Contract
2.7. Ablution or sanitary facilities should not be located within 100 m from a 1:100 year flood line including water courses, wetlands or within a horizontal distance of less than 100 m, whichever is applicable	Contractor	Duration of Contract
2.8. Supply adequate waste collection bins at site where construction is being undertaken.	Contractor	Duration of Contract

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» No unnecessary environmental impacts associated with site established</li> <li>» Site is secure and there is no unauthorised entry</li> <li>» No members of the public/ landowners injured</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» An incident reporting system will be used to record non-conformances to the EMP</li> <li>» ECO to monitor all construction areas on a continuous basis until all construction is completed; immediate report backs to site manager in terms of non-conformances recorded.</li> </ul>

### OBJECTIVE 3. : Manage / reduce ecological impacts

<b>Project component/s</b>	Construction of all infrastructure including: <ul style="list-style-type: none"> <li>» power station</li> <li>» access roads</li> <li>» water pipeline</li> </ul>
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	<ul style="list-style-type: none"> <li>» substation</li> <li>» power line</li> <li>» ash dump</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Unnecessary biodiversity loss</li> <li>» Damage to ecosystems</li> </ul>
<b>Activities/risk sources</b>	Construction Activities including: <ul style="list-style-type: none"> <li>» Site clearing</li> <li>» Site establishment</li> <li>» Excavations</li> <li>» Grading / levelling of surfaces</li> <li>» Concrete works</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» Limit biodiversity loss</li> <li>» Limit damage to ecosystems</li> </ul>

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
3.1. Manage the extent of construction activities to be limited to site only.	Contractor/ Contractor's Environmental Representative (CER)	Construction
3.2. Prevent the uncontrolled spread of environmental impacts due to construction on adjacent areas of natural habitat.	Contractor / CER	Construction
3.3. Undertake a search and rescue for plant and animal species that can be relocated within the development footprint and water pipeline alignment.	Contractor	Construction
3.4. Removal of vegetation/ plants shall be avoided until such time as soil stripping is required in an area, and similarly exposed surfaces must be re-vegetated or stabilised as soon as is practically possible after construction activities in an area are completed.	Contractor / CER	Construction
3.5. Implement a capture and relocation programme for faunal (animal) species prior to earthworks.	Contractor / CER	Construction
3.6. No animal may be hunted, trapped, snared or captured for any purpose whatsoever.	Contractor / CER	Construction
3.7. Implement a suitable procedure in the event of encountering potentially dangerous animals on the site (refer to pre-construction).	Contractor / CER	Construction
3.8. Prevent contamination of any natural habitat and nearby wetlands from any source of pollution.	Contractor / CER	Construction
3.9. Promote construction staff awareness regarding minimisation of impacts to habitats and faunal species in the area.	Contractor / CER	Construction

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» Limit biodiversity loss</li> <li>» Limit damage to ecosystems</li> <li>» Relevant procedures and method statements developed</li> <li>» Number of plants rescued and replanted</li> <li>» Number of animals rescued and relocated</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» CER to keep a record of all search and rescue attempts.</li> <li>» An incident reporting system will be used to record non-conformances to the EMP</li> <li>» ECO to monitor all construction areas on a continuous basis until all construction is completed; immediate report backs to site manager in terms of non-conformances recorded.</li> </ul>

#### OBJECTIVE 4. : Manage/ reduce impacts on wetlands

Five wetlands were identified within the study area of the channelled valley bottom and seepage variety, four of which are in near proximity to the project site:

- » Wetland 1 (Klipspruit and Brugspruit Confluence) – located in excess of 1km downstream of the project site.
- » Wetland 2 (Brugspruit upstream) – An un-channelled valley bottom wetland including both natural and artificial flows from adjacent slag dumps.
- » Wetland 3 (Brugspruit confluence) – is considered to be the most important wetland in the study area due to its water quality regulation function (toxicant and phosphate removal).
- » Wetland 4 (Brugspruit at existing bridge).
- » Wetland 5 (Brugspruit upstream).

One of the wetlands (Brugspruit confluence) is considered to be of specific importance due to its water quality regulation function (toxicant and phosphate removal) and is to be avoided by the proposed project. However the section of hillslope seep wetland (wetland 5) which cannot be avoided by the proposed ash disposal facility, will be lost. Wetland 5 is severely degraded currently and although impacts are expected to be high, potential for repair and rehabilitation is considered to be greater if exercised in terms of an established rehabilitation plan. The water pipeline will traverse wetland 2.

<b>Project component/s</b>	Construction of all infrastructure including: <ul style="list-style-type: none"> <li>» power station</li> <li>» ash disposal facility</li> <li>» water pipeline</li> </ul>
<b>Potential Impact</b>	» Damage to wetlands and loss of wetlands
<b>Activities/risk sources</b>	Construction Activities including:

	<ul style="list-style-type: none"> <li>» Site clearing</li> <li>» Site establishment</li> <li>» Excavations</li> <li>» Grading / levelling of surfaces</li> <li>» Concrete works</li> <li>» Trenching</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» Limit impact on wetlands</li> <li>» Limit footprint to immediate area required for infrastructure</li> <li>» Limit sediment load in wetlands</li> </ul>

<b>Mitigation: Action/control</b>		<b>Responsibility</b>	<b>Timeframe</b>
<b>Section of wetland in ash disposal facility footprint (Wetland 5)</b>			
4.1.	Implement wetland rehabilitation plan should wetlands be impacted (refer to pre-construction)	Developer / Contractor	All phases
4.2.	Fence footprint area off prior to construction to prevent any unnecessary access into the impacted wetland	Contractor / CER	Contractor / CER
4.3.	Limit site clearance and damage only to footprint of ash disposal facility and associated infrastructure	Contractor / CER	Contractor / CER
4.4.	Implement concurrent rehabilitation within the areas damaged during the construction activities.	Contractor / CER	Contractor / CER
4.5.	Hydrocarbon storage facilities, contaminated water storage areas and waste storage facilities should be located outside of the delineated wetland areas as well as their immediate catchment areas.	Contractor / CER	Contractor / CER
4.6.	Ensure management of the quality of water entering the Brugspruit system	Contractor / CER	Contractor / CER
4.7.	Install silt traps at designated areas to prevent sediment movement with runoff water	Contractor / CER	Contractor / CER
4.8.	Implement storm water measures to prevent runoff from the construction area directly into the wetland	Contractor / CER	Contractor / CER
4.9.	Implement erosion control measures at the construction sites and areas of exposed soil	Contractor / CER	Contractor / CER
4.10.	Undertake the re-vegetation and concurrent rehabilitation to protect exposed surfaces (refer to wetland rehabilitation plan)	Contractor / CER	Contractor / CER
4.11.	Make use of only indigenous vegetation during re-vegetation stages	Contractor / CER	Contractor / CER

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
4.12. Remove alien species concurrently, have Alien invasive eradication plan in place to manage and eradicate alien species within all wetlands delineated	Contractor / CER	Contractor / CER
4.13. Ensure that no harvesting of vegetation from wetlands occur	Contractor / CER	Contractor / CER
4.14. Undertake constant monitoring of vegetation communities and react timeously to problems detected	Contractor / CER	Contractor / CER
4.15. Species from wetland 4 (located just downstream) may be introduced into wetland 5 as part of the rehabilitation activities	Contractor / CER	Contractor / CER
<b>Water pipeline construction</b>		
4.16. Fence-off footprint area along the proposed pipeline to prevent any unintended access into the wetland	Contractor / CER	Construction
4.17. Restrict all movement to designated areas and use the roads that already exist within this area to provide access to different areas	Contractor / CER	Construction
4.18. Concurrent rehabilitation and re-vegetation during construction should take place	Contractor / CER	Construction
4.19. Compile and work according to the Work Method Statement	Contractor / CER	Construction
4.20. Implement rehabilitation programmes and restore free-draining surface or slightly concave surface of the covering soil to prevent pooling	Contractor / CER	Construction
4.21. Implement erosion control measures at the construction sites and areas of exposed soil.	Contractor / CER	Construction
<b>Other wetlands</b>		
4.22. Ensure that other identified wetlands in the area are rehabilitated and managed in terms of the wetland rehabilitation plan.	Developer / Contractor / CER	Construction
4.23. Avoid impacting on other wetlands and maintain suitable offset distances (100m) from wetlands as far as possible. This of particular importance for the Brugspruit Confluence (Wetland 3).	Contractor / CER	Construction
4.24. Hydrocarbon storage facilities, contaminated water storage areas and waste storage facilities should be located outside of the delineated wetland areas as well as their immediate catchment areas.	Contractor / CER	Construction

**Performance**

» Limit impact on wetlands

<b>Indicator</b>	<ul style="list-style-type: none"> <li>» Limit sediment load in wetlands</li> <li>» Concurrent wetland rehabilitation and improvement in ecological functioning</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» An incident reporting system will be used to record non-conformances to the EMP</li> <li>» ECO to monitor all construction areas on a continuous basis until all construction is completed; immediate report backs to site manager in terms of non-conformances recorded.</li> </ul>

### OBJECTIVE 5. : Good soil management

<b>Project component/s</b>	Construction of all infrastructure including: <ul style="list-style-type: none"> <li>» power station</li> <li>» access roads</li> <li>» substation</li> <li>» water pipeline</li> <li>» power line</li> <li>» ash dump</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Soil Loss</li> <li>» Soil erosion</li> <li>» Sedimentation</li> </ul>
<b>Activities/risk sources</b>	All construction activities that disturb the soil below surface, such as levelling, excavations etc.
<b>Mitigation: Target/Objective</b>	Ensure effective topsoil covering on all disturbed areas.

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
5.1 Strip and stockpile topsoil from all areas where soil will be disturbed.	Contractor	Construction
5.2 If an activity will mechanically disturb below surface in any way, then the upper 40 cm of topsoil should first be stripped from the entire disturbed surface and stockpiled for re-spreading during rehabilitation.	Contractor	Construction
5.3 Topsoil stockpiles must be conserved against losses through erosion by establishing vegetation cover on them or through the use of other appropriate means.	Contractor	Construction
5.4 Dispose of all subsurface spoils from excavations where they will not impact on other land uses or where they can be effectively covered with topsoil.	Contractor	Construction

Mitigation: Action/control	Responsibility	Timeframe
5.5 The stockpiled topsoil must be evenly spread over the entire disturbed surface.	Contractor	Construction
5.6 Utilise appropriate Erosion Control measures, where required. Maintain measures throughout the construction phase.	Contractor	Construction
5.7 Areas that have been compacted should be ripped to break up the compacted soil.	Contractor	Construction
5.8 After completion of construction activities, re-spread topsoil over the surface. Ensure effective topsoil covering to conserve soil fertility on all disturbed areas.	Contractor	Construction
5.9 Rehabilitate disturbed areas and stabilise soils after construction.	Contractor	Post-Construction
5.10 Implement biodiversity management plan and rehabilitation plan developed for the site in the pre-construction phase.		

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» No disturbed areas are left without an effective covering of topsoil, and potential for re-vegetation.</li> <li>» Areas where erosion has developed are appropriately managed and maintained.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» An incident reporting system will be used to record non-conformances to the EMP</li> <li>» ECO to monitor all construction areas on a continuous basis until all construction is completed; immediate report backs to site manager in terms of non-conformances recorded.</li> <li>» Establish an effective record keeping system for each area where soil is disturbed/ poor soil management occurs during the construction phase . These records should be included in ECO reports, and should include all the records below.                             <ul style="list-style-type: none"> <li>* Record the GPS coordinates of each area.</li> <li>* Record the date of topsoil stripping.</li> <li>* Record the GPS coordinates of where the topsoil is stockpiled.</li> <li>* Record the date of cessation of constructional (or operational) activities at the particular site.</li> <li>* Photograph the area on cessation of constructional activities.</li> <li>* Record date and depth of re-spreading of topsoil.</li> <li>* Photograph the area on completion of rehabilitation and on an annual basis thereafter to show vegetation establishment and evaluate progress of restoration over time.</li> </ul> </li> </ul>

**OBJECTIVE 6. : Prevent/ Limit impacts on surface water bodies**

<b>Project component/s</b>	Construction of all infrastructure including: <ul style="list-style-type: none"> <li>» power station</li> <li>» access roads</li> <li>» substation</li> <li>» water pipeline</li> <li>» power line</li> <li>» ash dump</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Damage to surface water resources</li> <li>» Clearance of project footprint could lead to increased sedimentation and siltation.</li> <li>» Road construction, pipelines and conveyance may alter the natural characteristics of the drainage system.</li> <li>» Accidental spills could lead to water pollution.</li> </ul>
<b>Activities/risk sources</b>	Risks may occur due to construction activities including: <ul style="list-style-type: none"> <li>» Site clearing</li> <li>» Site establishment</li> <li>» Excavations</li> <li>» Grading / levelling of surfaces</li> <li>» Concrete works</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» Surface water quality on the site to comply with the Resource Quality Objectives set for the catchment.</li> <li>» No significant impacts on surface water bodies.</li> </ul>

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
6.1. Minimise construction footprint to be outside watercourses, riparian zones and flood lines.	Contractor	Construction
6.2. Minimise disturbance to flow regime and prevent erosion by utilising erosion control measures in all disturbed areas resulting from construction activities where a potential for erosion exists.	Contractor	Construction
6.3. Implement appropriate stormwater management and water pollution control facilities such as pollution control dams, channels and storm water drainage system.	Contractor	Construction
6.4. Wherever possible, treatment of water for re-use should be undertaken. Only clean water should be discharged from the site (if required).	Contractor	Construction
6.5. As a last resort, discharge storm water in compliance with Department of Water Affairs' limits.	Contractor	Construction
6.6. Implement systems for the separation of clean and	Contractor	Construction

Mitigation: Action/control	Responsibility	Timeframe
dirty water.		
6.7. All contaminated water to be contained in dedicated pollution control structures/ facilities.	Contractor	Construction
6.8. If possible, re-use, recycle and minimise all waste water generated on the site.	Contractor	Construction
6.9. The construction of pipelines, roads and road servitudes (disturbance zones) in or adjacent to the delineated wetland/riparian zones in the area is to be managed and strictly controlled to minimise damage these systems.	Contractor	Construction
6.10. Where applicable, disturbed wetlands and riparian zones (i.e. for those areas that will not form part of the road and pipeline infrastructure operational footprint but that were disturbed as part of the construction activities) should be re-vegetated using site-appropriate indigenous vegetation and/or seed mixes.	Contractor	Construction
6.11. In-stream habitat conditions (with regard to the river's morphology) should be recreated as far as possible; this pertains to those areas where construction activities have disturbed the in-stream habitat beyond the operational footprint of the pipeline crossings, culverts or bridges.	Contractor	Construction
6.12. Implement water management plans (and wetland rehabilitation plans) developed in pre-construction phase.	Contractor	Construction

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» Limited / no impact / contamination of surface water bodies during the construction phase.</li> <li>» Implement water monitoring programme</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» ECO to monitor contractors performance</li> <li>» Photographic records</li> </ul>

## OBJECTIVE 7. : Management of Dust and Air Emissions

<b>Project component/s</b>	Construction of all infrastructure including: <ul style="list-style-type: none"> <li>» power station</li> <li>» access roads</li> <li>» substation</li> <li>» power line</li> <li>» ash dump</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Dust</li> </ul>



	» Poor air quality during construction.
<b>Activities/risk sources</b>	Construction Activities including: » Site clearing » Site establishment » Excavations » Grading / levelling of surfaces » Concrete works » Road works
<b>Mitigation: Target/Objective</b>	» Current ambient air quality is maintained » Limited dust on the construction site

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
7.1. Traffic control measures must be implemented to limit vehicle-entrained dust from unpaved roads, e.g. by limiting vehicle speeds and by restricting traffic volumes.	Contractor	Construction
7.2. Unpaved road surfaces should be sprayed with water or an appropriate surfactant to ensure high moisture content which will bind the silt.	Contractor	Construction
7.3. Stabilise open areas with dust palliative, gravel or similar.	Contractor	Construction
7.4. Haul vehicles moving outside the construction site carrying material that can be wind-blown must be covered with tarpaulins.	Contractor	Construction
7.5. Disturbed areas must be re-vegetated as soon as practicable once construction is completed in an area.	Contractor	Construction
7.6. Utilise dust control measures during construction as and when required	Contractor	Construction
7.7. Construction vehicles and equipment must be maintained in a road-worthy condition at all times.	Contractor	Construction

<b>Performance Indicator</b>	» No complaints from the public regarding dust or other emissions from the construction site. » No visible dust plumes during the construction phase.
<b>Monitoring</b>	» The CER must undertake visually monitor dust through daily inspections of dust generation by construction activities throughout the construction phase. » A complaints register must be maintained, in which any complaints from residents/the community will be logged. Complaints will be investigated and, where appropriate, acted upon. » An incident reporting system must be used to record non-conformances to the EMP.

**OBJECTIVE 8. : Control noise due to construction activities**

<b>Project component/s</b>	Construction of all infrastructure including: <ul style="list-style-type: none"> <li>» power station</li> <li>» access roads</li> <li>» substation</li> <li>» water pipeline</li> <li>» power line</li> <li>» ash dump</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Increased noise levels at potential noise-sensitive receptors.</li> <li>» Changing ambient sound levels could change the acceptable land use capability.</li> <li>» Any construction activities taking place at night.</li> </ul>
<b>Activities/risk sources</b>	Construction Activities including: <ul style="list-style-type: none"> <li>» Site clearing</li> <li>» Site establishment</li> <li>» Excavations</li> <li>» Grading / levelling of surfaces</li> <li>» Concrete works</li> <li>» Blasting (if required)</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» Ensure that the change in ambient sound/Rating levels as experienced by receptors is less than 5 dBA.</li> <li>» Prevent the generation of nuisance noises.</li> <li>» Ensure acceptable noise levels at noise sensitive receptors (NSD) in Clewer</li> </ul>

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
8.1. Inform receptors in Clewer and surrounding landowners if any night-time construction activities are to take place within 500m from this receptor.	Contractor	Prior to night-time construction activities
8.2. Quarterly noise measurements are recommended at NSD01 during the construction phase as well at any other receptors that registered a valid and relevant noise complaint.	Contractor / acoustic consultant	Quarterly
8.3. If a valid and reasonable complaint is registered relating to the construction of the facility, additional noise measurements should be undertaken as recommended by an acoustic consultant.	Contractor / acoustic consultant	As and when required

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» Ensure that the change in ambient sound levels or Rating level as experienced by receptors is less than 7dBA during quiet periods.</li> <li>» Ensure that maximum noise levels at potentially sensitive receptors are less than 65 dBA.</li> </ul>
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	» No noise complaints are registered.
<b>Monitoring</b>	» ECO to monitor is any noise complaints is lodged with the Contractor.

### OBJECTIVE 9. : Protection of sites of heritage value

<b>Project component/s</b>	Construction of all infrastructure including: <ul style="list-style-type: none"> <li>» power station</li> <li>» access roads</li> <li>» substation</li> <li>» water pipeline</li> <li>» power line</li> <li>» Ash dump</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Heritage objects or artefacts found on site are inappropriately managed or destroyed</li> <li>» Loss of fossil resources</li> </ul>
<b>Activity/risk source</b>	<ul style="list-style-type: none"> <li>» Site preparation and earthworks</li> <li>» Foundations or plant equipment installation</li> <li>» Mobile construction equipment movement on site</li> <li>» Power line construction activities</li> </ul>
<b>Mitigation: Target/Objective</b>	» To ensure that any significant heritage objects found on site are treated appropriately and in accordance with the relevant legislation

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
9.1. Ensure that the cemetery site is fenced and that direct impacts to the cemetery site are avoided.	Contractor	Pre-construction and construction
9.2. The location of initiation sites should be noted by the planning team should any future expansions into the area occur. Ideally these practices should be allowed to continue. These areas should also be avoided by Transalloys employees during initiation school times	Contractor / CER / ECO	Pre-construction and construction
9.3. 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.	Contractor / ECO	Pre-construction
9.4. If any heritage finds such as tool scatters, bone or fossil remains are exposed or noticed during construction, activities must be stopped and a qualified archaeologist must be contacted to assess the heritage find.	Archaeologist/ CER	As and when required
9.5. If a heritage object is found, work in that area must be stopped immediately, and appropriate	Archaeologist/ suitably qualified	As and when required

Mitigation: Action/control	Responsibility	Timeframe
specialists brought in to assess to site, notify the administering authority of the item/site, and undertake due/required processes.	person	

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» Minimal disturbance outside of designated work areas</li> <li>» All heritage items located are dealt with as per the legislative guidelines</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Observation of excavation activities by ECO throughout construction phase</li> <li>» Monitoring / Inspection of all clearing and earthworks by ECO.</li> <li>» An incident reporting system will be used to record non-conformances to the EMPr.</li> </ul>

### OBJECTIVE 10. : Construction traffic management

The traffic volumes generated by the proposed Transalloys Power Station development will not have a significant impact on the external road network as the road network requires various improvements irrespective of the development. Various intersection improvements are recommended in order to ensure safe adequate vehicle capacity as well as safe vehicle movements during the construction and operational phase. The applicant should engage with the road authorities to further address the issue of road upgrades.

<b>Project component/s</b>	<ul style="list-style-type: none"> <li>» Construction vehicles</li> <li>» Construction work force</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Traffic congestion</li> <li>» Risk of accidents</li> <li>» Deterioration of road conditions due to abnormal loads</li> </ul>
<b>Activity/risk source</b>	<ul style="list-style-type: none"> <li>» Transportation of components to site</li> <li>» Construction vehicles utilising public roads</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» To minimise impact of traffic associated with the construction of the power station on local traffic</li> <li>» To minimise potential for negative interaction between pedestrians or sensitive users and traffic associated with the construction of the power station.</li> </ul>

Mitigation: Action/control	Responsibility	Timeframe
10.1. Implement a traffic management plan for the construction phase of the power station.	Contractor	Construction

Mitigation: Action/control	Responsibility	Timeframe
10.2. All relevant permits for abnormal loads must be applied for from the relevant authority.	Contractor / Developer	Pre-construction
10.3. Designated accesses to the proposed site must be created to ensure safe entry and exit.	Contractor	Pre-construction
10.4. Appropriate road management strategies must be implemented on external and internal roads with all employees and contractors required to abide by standard road and safety procedures.	Contractor	Pre-construction
10.5. Any traffic delays as a result of construction traffic must be co-ordinated with the appropriate authorities.	Contractor	Duration of contract
10.6. Signage must be established at appropriate points warning of turning traffic and the construction site (all signage to be in accordance with prescribed standards and maintained for the entire construction period)	Contractor	Duration of contract
10.7. Appropriate maintenance of all vehicles must be ensured to minimise risk of break-downs.	Contractor	Duration of contract
10.8. All construction vehicles travelling on public roads must adhere to the specified speed limits and relevant legislation. All drivers must be in possession of an appropriate valid driver's license.	Contractor	Duration of contract

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» No traffic incidents involving the power station construction vehicles.</li> <li>» Appropriate signage in place</li> <li>» No complaints resulting from traffic congestion, delays or driver negligence associated with construction of the power station.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Visual monitoring of dust produced by traffic movement</li> <li>» Visual monitoring of traffic control measures to ensure they are effective</li> <li>» A complaints register must be maintained, in which any complaints from the community must be logged. Complaints must be investigated and, if appropriate, acted upon</li> <li>» An incident reporting system to be used to record non-conformances to the EMP</li> </ul>

### OBJECTIVE 11. : Mitigation of visual impacts associated with construction

<b>Project Component/s</b>	Construction site
<b>Potential Impact</b>	Visual impact of general construction activities, and the potential scarring

	of the landscape due to vegetation clearing and resulting erosion.
<b>Activity/Risk Source</b>	The viewing of the above mentioned by observers on or near the site.
<b>Mitigation: Target/Objective</b>	Minimal visual intrusion by construction activities and intact vegetation cover outside of immediate works areas.

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
11.1. Retain the area indicated as "potential visual buffer area" (especially the Brugspruit and side stream wetlands/floodplains) in its current state (if possible) in order to create a natural offset between the observers and the development.	Contractor	Pre-construction and Construction
11.2. Plant vegetation barriers (where required) along the southern boundary of the ash disposal facility site in order to shield the ash disposal facility, structures and activities from observers residing in the north of Clewer.	Contractor / developer / landscape contractor	Construction
11.3. Ensure that vegetation is not unnecessarily cleared or removed during the construction period.	Contractor	Construction
11.4. Plan the placement of lay-down areas and temporary construction equipment camps in order to minimise vegetation clearing (i.e. in already disturbed areas) wherever possible.	Contractor	Construction
11.5. Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.	Contractor	Construction
11.6. Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities.	Contractor	Construction
11.7. Reduce and control construction dust through the use of approved dust suppression techniques as and when required (i.e. whenever dust becomes apparent).	Contractor	Construction
11.8. Shield the sources of light by physical barriers (walls, vegetation, or the structure itself).	Contractor	Construction
11.9. Limiting mounting heights of lighting fixtures, or alternatively using foot-lights or bollard level lights.	Contractor	Construction
11.10. Make use of Low Pressure Sodium lighting or other types of low impact lighting.	Contractor	Construction
11.11. Rehabilitate all disturbed areas, construction areas, servitudes etc. immediately after the	Contractor	Post-Construction

Mitigation: Action/control	Responsibility	Timeframe
completion of construction works.		

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» Limited visual scarring of the landscape due to construction.</li> <li>» No complaints received by sensitive visual receptors during construction due to lighting nuisance.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Monitoring of vegetation clearing during construction (by contractor as part of construction contract).</li> <li>» Monitoring of rehabilitated areas quarterly for at least a year following the end of construction (by contractor as part of construction contract).</li> </ul>

**OBJECTIVE 12. : Stimulate and enhance positive socio-economic impacts during the construction phase**

<b>Project component/s</b>	Construction
<b>Potential Impact</b>	High local economic benefits
<b>Activities/risk sources</b>	Construction procurement practices
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» Employ local community members as far as possible</li> <li>» Stimulate the local economy</li> </ul>

Mitigation: Action/control	Responsibility	Timeframe
12.1. Increase the local procurement practices and employment of people from local communities as far as feasible to maximise the benefits to the local economies.	The project developer and contractors	Construction
12.2. Engage with local authorities and business organisations to investigate the possibility of procurement of construction materials, goods, and products from local suppliers where feasible.	The project developer and contractors	Construction
12.3. Inform the local community meetings to advise the local labour on the project that is planned to be established and the jobs that can potentially be applied for.	The project developer and contractors	Construction
12.4. Sub-contract to local construction companies where possible	The project developer and contractors	Construction
12.5. Use local suppliers where feasible.	The project developer and contractors	Construction

Mitigation: Action/control	Responsibility	Timeframe
12.6. As much local labour as possible, should be considered for employment to increase the positive impact on the local economy	The project developer and contractors	Construction

<b>Performance Indicator</b>	» Developer has engaged with local authorities and business organisations. » Percentage of labour force employed from local community. » Number of contracts signed between contractor and the local construction companies to supply goods and services directly used in the construction and support of site activities	
<b>Monitoring</b>	» The contractors to provide the information on local labour to the ECO to report in ECO reports.	

### OBJECTIVE 13. : Skills development and training during construction

<b>Project component/s</b>	Construction of the Transalloys Power Station and localisation of the project's expenditure
<b>Potential Impact</b>	Moderate local expertise development
<b>Activities/risk sources</b>	Construction procurement practice employed by the EPC contractor
<b>Mitigation: Target/Objective</b>	Developer's investment plan

Mitigation: Action/control	Responsibility	Timeframe
13.1. Facilitate knowledge and skills transfer between workers	The Project Developer	Construction
13.2. Implement apprenticeship programmes to build onto existing or develop new skills of construction workers, especially those coming from the local communities	The Project Developer	Construction

<b>Performance Indicator</b>	» Number of apprenticeships offered » Record of skills development programmes	
<b>Monitoring</b>	» The developer to provide the information on training and skills development initiatives to the ECO to report in ECO reports.	



**OBJECTIVE 14. : Reduce social impacts related to crime, social conflicts, property damages and loss of assets**

<b>Project component/s</b>	Construction of all infrastructure including: <ul style="list-style-type: none"> <li>» power station</li> <li>» access roads</li> <li>» substation</li> <li>» water pipeline</li> <li>» power line</li> <li>» ash dump</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Increase in crime and social conflict incidents due to the influx of construction workers and job seekers into the area;</li> <li>» property damages;</li> <li>» theft and losses of assets on the nearby farms including poaching.</li> </ul>
<b>Activities/risk sources</b>	Construction Activities including: <ul style="list-style-type: none"> <li>» Site clearing</li> <li>» Site establishment</li> <li>» Excavations</li> <li>» Grading / levelling of surfaces</li> <li>» Concrete works</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» No illegal / criminal activities due to the construction work-force</li> <li>» No damage to property/ assets</li> </ul>

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
14.1. The establishment of central recruitment office/ mechanism.	The Project Developer	Construction
14.2. Ensure that job seekers are not allowed to loiter around the gates or set up informal settlements in the vicinity of the site.	Contractor	Construction
14.3. Construction workers must have a form of identification such as ID tags/ ID cards.	Contractor	Construction
14.4. Access to the construction site must be strictly controlled.	Contractor	Construction
14.5. Any proven damage to privately owned land or assets as a result of the construction of the power station and associated infrastructure must follow a process to rectify / compensate any such person for any such losses.	Contractor / Liable Party	Construction

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» Number of the workers employed in construction that come from local communities.</li> <li>» Access control system to the construction site.</li> </ul>
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	» Number of complaints regarding property damages and asset losses received from the affected and the percentage thereof that has been resolved.
<b>Monitoring</b>	» Developer to monitor the above.

**OBJECTIVE 15. : Appropriate Waste Management during construction**

<b>Project component/s</b>	Storage and handling of waste
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Generation of contaminated wastes from used chemical containers</li> <li>» Inefficient use of resources resulting in excessive waste generation</li> <li>» Pollution of the surrounding environment through inappropriate waste management practices</li> <li>» Litter or contamination of the site or water through poor waste management practices</li> </ul>
<b>Activity/risk source</b>	<ul style="list-style-type: none"> <li>» Construction activities</li> <li>» Spoil material from excavation, earthworks and site preparation</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» To ensure that the storage and handling of waste on-site does not cause pollution to the environment or harm to persons</li> <li>» To minimise production of waste</li> <li>» To ensure appropriate waste handling, storage and disposal</li> <li>» To avoid environmental harm from waste disposal</li> </ul>

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
15.1. Construction contractors must provide specific detailed waste management method statements to appropriately deal with all waste streams.	Contractor	Construction
15.2. An integrated waste management approach that is based on waste minimisation must be implemented. This approach must include reduction, recycling, re-use and disposal where appropriate.	Contractor	Construction
15.3. Soil contaminated/ polluted as a result of major spillages must be removed from the site and disposed of at a licensed hazardous waste disposal facility. Soils contaminated/ polluted through minor spills can be treated on site provided they are contained and have not penetrated the soil surface.	Contractor	Construction
15.4. Hazardous waste substances must not be stored where there could be accidental leakage into	Contractor	Construction

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
surface or subterranean water.		
15.5. Oily water from bunded areas and workshop areas (oil tanks) must be removed from site by licensed contractors and in secure containers to avoid spills.	Contractor	Construction
15.6. Any storage and disposal permits/approvals which may be required must be obtained, and the conditions attached to such permits and approvals must be complied with.	Contractor	Construction
15.7. Specific areas must be designated on-site for the temporary management of various waste streams, i.e. general refuse, construction waste (wood and metal scrap) and contaminated waste. Location of such areas must seek to minimise the potential for impact on the surrounding environment, including prevention of contaminated runoff, seepage and vermin control.	Contractor	Construction
15.8. Storage, handling and disposal of waste must be in accordance with legislated requirements (as detailed in the NEM: Waste Management Act and associated Regulations and Standards)	Contractor	Construction
15.9. Where possible, construction and general wastes on-site must be reused or recycled. Bins and skips must be available on-site for collection, separation and storage of waste streams (such as wood, metals, general refuse etc.).	Contractor	Construction
15.10. Disposal of waste must be in accordance with relevant legislative requirements, including the use of licensed contractors.	Contractor	Construction
15.11. Waste bins must be available and located in the area where the contract staff are working.	Contractor	Construction
15.12. All general waste must be kept in sealable storage containers that are animal proof, i.e. bins or skips.	Contractor	Construction
15.13. All general waste on site must be collected weekly (or more regularly if required) by an approved contractor (holder of a certificate indicating where the waste will be disposed of) .	Contractor	Construction
15.14. No waste may be buried or burnt on site.	Contractor	Construction
15.15. Hydrocarbon waste must be contained and stored in sealed containers within an appropriately bunded area.	Contractor	Construction
15.16. Waste and surplus dangerous goods must be kept to a minimum and must be transported by	Contractor	Construction

Mitigation: Action/control	Responsibility	Timeframe
approved waste transporters to sites designated for their disposal.		
15.17. Documentation (waste manifest) must be maintained detailing the quantity, nature and fate of any regulated waste. Waste disposal records must be available for review at any time.	Contractor	Construction
15.18. Dispose of all solid waste collected at an appropriately registered waste disposal site. The disposal of waste shall be in accordance with all relevant legislation. Under no circumstances may waste be burnt on site.	Contractor	Construction
15.19. Where a registered waste site is not available close to the construction site, provide a method statement with regard to waste management.	Contractor	Pre-construction
15.20. Upon the completion of construction, the area must be cleared of potentially polluting materials.	Contractor	Completion of construction
15.21. Corrective action must be undertaken immediately if a complaint is made, or potential/actual leak or spill of polluting/toxic substance identified. This includes stopping the contaminant from further escaping, cleaning up the affected environment as much as practically possible and implementing preventive measures.	Contractor	Construction

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» No water or soil contamination by spills</li> <li>» No complaints received regarding waste on site or indiscriminate dumping</li> <li>» Internal site audits ensuring that waste segregation, recycling and reuse is occurring appropriately</li> <li>» Provision of all appropriate waste manifests for all waste streams</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Observation and supervision of waste storage and handling practices and vehicle maintenance throughout construction phase.</li> <li>» Observation and supervision of waste management practices throughout the construction phase.</li> <li>» Waste collection to be monitored on a regular basis.</li> <li>» Waste documentation completed.</li> <li>» A complaints register must be maintained, in which any complaints from the community will be logged. Complaints must be investigated and, if appropriate, acted upon.</li> <li>» An incident reporting system will be used to record non-conformances to the EMPr.</li> </ul>

**OBJECTIVE 16. : Appropriate Storage and Handling of chemicals and hazardous substances during construction**

<b>Project component/s</b>	Storage and handling of chemicals and hazardous substances
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Release of contaminated water from contact with spilled chemicals</li> <li>» Generation of contaminated wastes from used chemical containers</li> <li>» Pollution of the surrounding environment through inappropriate materials management practices</li> <li>» Pollution of water and soil resources</li> </ul>
<b>Activity/risk source</b>	<ul style="list-style-type: none"> <li>» Construction activities</li> <li>» Hydrocarbon use and storage</li> <li>» Fuelling of vehicles</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» To ensure that the storage and handling of chemicals and hydrocarbons on-site does not cause pollution to the environment or harm to persons</li> <li>» To ensure that the storage and maintenance of machinery on-site does not cause contamination/pollution of the environment or harm to persons</li> <li>» To avoid environmental harm from materials storage</li> </ul>

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
16.1. An effective monitoring system must be implemented during the construction phase to detect any leakage or spillage of hazardous substances during their transportation, handling, use and storage.	Contractor	Construction
16.2. Spill kits must be made available on-site for the clean-up of spills and leaks of contaminants.	Contractor	Construction
16.3. Corrective action must be undertaken immediately if a complaint is made, or potential/actual leak or spill of polluting/toxic substance identified. This includes stopping the contaminant from further escaping, cleaning up the affected environment as much as practically possible and implementing preventive measures.	Contractor	Construction
16.4. In the event of a major spill or leak of contaminants, the area must be demarcated/isolated and the relevant administering authority must be immediately notified as per the notification of emergencies/incidents.	Contractor	Construction
16.5. All concrete mixing on site must be conducted in a designated area on an appropriately sealed	Contractor	Construction

Mitigation: Action/control	Responsibility	Timeframe
surface.		
16.6. Soil contaminated/ polluted as a result of a major spill must be removed from the site and disposed of at a licensed hazardous waste disposal facility. Soils contaminated/ polluted through minor spills can be treated on site provided they are contained and have not penetrated the soil surface.	Contractor	Construction
16.7. Routine servicing and maintenance of vehicles must take place in designated areas (except for emergency situations or large cranes which cannot be moved off-site). If repairs of vehicles must take place on site, an appropriate drip tray must be used to contain any fuel or oils.	Contractor	Construction
16.8. All hazardous material and chemicals on site must be stored in a clearly marked, secure area. The secure area must be designed in a way to ensure that the hazardous material and chemicals will not leak or spill and harm the environment.	Contractor	Construction
16.9. All stored fuels to be maintained within a bunded area and on a sealed surface, or contained in an appropriate manner as per the requirements of SABS 089:1999 Part 1.	Contractor	Construction
16.10. Fuel storage areas must be inspected regularly to ensure bund stability, integrity and function.	Contractor ECO	Construction
16.11. Hazardous substances must not be stored where there could be accidental leakage into surface or subterranean water.	Contractor	Construction
16.12. Construction machinery must be stored in an appropriately demarcated, secure and sealed area.	Contractor	Construction
16.13. Oily water from bunded areas must be removed from site by licensed contractors and in secure containers to avoid spills.	Contractor	Construction
16.14. The storage of flammable and combustible liquids such as oils will be in designated areas which are appropriately bunded, and stored in compliance with MSDS files.	Contractor	Construction
16.15. Any storage and disposal permits/approvals which may be required must be obtained, and the conditions attached to such permits and approvals will be compiled with.	Contractor	Construction
16.16. Transport of all hazardous substances must be in accordance with the relevant legislation and regulations.	Contractor	Construction

Mitigation: Action/control	Responsibility	Timeframe
16.17. Upon the completion of construction, the area must be cleared of potentially polluting materials.	Contractor	Completion of construction

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» No chemical spills outside of designated storage areas</li> <li>» No water or soil contamination by spills</li> <li>» No complaints received regarding waste on site or indiscriminate dumping</li> <li>» Internal site audits ensuring that waste segregation, recycling and reuse is occurring appropriately</li> <li>» Provision of all appropriate waste manifests for all waste streams</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Observation and supervision of chemical storage and handling practices and vehicle maintenance throughout construction phase.</li> <li>» A complaints register must be maintained, in which any complaints from the community will be logged. Complaints will be investigated and, if appropriate, acted upon.</li> <li>» Observation and supervision of waste management practices throughout construction phase.</li> <li>» Waste collection to be monitored on a regular basis.</li> <li>» Waste documentation completed.</li> <li>» A complaints register will be maintained, in which any complaints from the community will be logged. Complaints will be investigated and, if appropriate, acted upon.</li> <li>» An incident reporting system will be used to record non-conformances to the EMPr.</li> </ul>

### OBJECTIVE 17. : Effective management of concrete batching plants

<b>Project component/s</b>	» Batching plant and associated activities
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Dust emissions</li> <li>» Release of contaminated water</li> <li>» Generation of contaminated wastes from used chemical containers</li> <li>» Inefficient use of resources resulting in excessive waste generation</li> </ul>
<b>Activity/risk source</b>	<ul style="list-style-type: none"> <li>» Operation of the batching plant</li> <li>» Packaging and other construction wastes</li> <li>» Hydrocarbon use and storage</li> <li>» Spoil material from excavation, earthworks and site preparation</li> </ul>
<b>Mitigation: Target/Objective</b>	» To ensure that the operation of the batching plant does not cause pollution to the environment or harm to persons

Mitigation: Action/control	Responsibility	Timeframe
17.1. Where possible concrete batching plants should be sited such that impacts on the environment or	Contractor	Construction phase

Mitigation: Action/control	Responsibility	Timeframe
the amenity of the local community from noise, odour or polluting emissions are minimised		
17.2. Where there is a regular movement of vehicles. Access and exit routes for heavy transport vehicles should be planned to minimise noise and dust impacts on the environment	Contractor	Construction phase
17.3. The concrete batching plant site should demonstrate good maintenance practices, including regular sweeping to prevent dust build-up	Contractor	Construction phase
17.4. The prevailing wind direction should be considered to ensure that bunkers and conveyors are sited in a sheltered position to minimise the effects of the wind.	Contractor	Construction phase
17.5. Aggregate material should be delivered in a damp condition, and water sprays or a dust suppression agent should be correctly applied to reduce dust emissions and reduce water usage	Contractor	Construction phase
17.6. Conveyors must be designed and constructed to prevent fugitive dust emissions. This may include covering the conveyor with a roof, installing side protection barriers and equipping the conveyor with spill trays, which direct material to a collection point. Belt cleaning devices at the conveyor head may also assist to reduce spillage.	Contractor	Construction phase
17.7. The site should be designed and constructed such that clean stormwater, including roof runoff, is diverted away from contaminated areas and directed to the stormwater discharge system.	Contractor	Construction phase
17.8. Any liquids stored on site, including admixtures, fuels and lubricants, should be stored in accordance with applicable legislation	Contractor	Construction phase
17.9. Contaminated stormwater and process wastewater should be captured and recycled where possible. A wastewater collection and recycling system should be designed to collect contaminated water.	Contractor	Construction phase
17.10. Process wastewater and contaminated stormwater collected from the entire site should be diverted to a settling pond, or series of ponds, such that the water can be reused in the concrete batching process.	Contractor	Construction phase
17.11. Areas where spills of oils and chemicals may occur should be equipped with easily accessible	Contractor	Construction



Mitigation: Action/control	Responsibility	Timeframe
spill control kits to assist in prompt and effective spill control		phase
17.12. Ensure that all practicable steps are taken to minimise the adverse effect that noise emissions. This responsibility includes not only the noise emitted from the plant and equipment but also associated noise sources, such as radios, loudspeakers and alarms	Contractor	Construction phase
17.13. Where possible, waste concrete should be used for construction purposes at the batching plant or project site.	Contractor	Construction phase
17.14. The batching plant should be monitored by the ECO to ensure that the plant is operating according to its environmental objectives and within legislative requirements.	ECO	Construction phase

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» No complaints regarding dust or contamination</li> <li>» No water or soil contamination by chemical spills</li> <li>» No complaints received regarding waste on site or indiscriminate dumping</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Observation and supervision of chemical storage and handling practices and vehicle maintenance throughout construction phase</li> <li>» A complaints register will be maintained, in which any complaints from the community will be logged. Complaints will be investigated and, if appropriate, acted upon</li> <li>» A complaints register will be maintained, in which any complaints from the community will be logged. Complaints will be investigated and, if appropriate, acted upon</li> <li>» An incident reporting system will be used to record non-conformances to the EMP</li> <li>» Developer or appointed ECO must monitor indicators listed above to ensure that they have been met for the construction phase</li> </ul>

**OBJECTIVE 18. : To minimise the potential risk of increased veld fires during the construction phase**

<b>Project component/s</b>	Construction and establishment activities associated with the establishment of power station including infrastructure.
<b>Potential Impact</b>	Grass fires can pose a personal safety risk to local farmers and communities, and their homes, crops, livestock and farm infrastructure, such as gates and fences.
<b>Activity/risk</b>	The presence of construction workers and their activities on the site can

<b>source</b>	increase the risk of grass fires.
<b>Mitigation: Target/Objective</b>	To avoid and or minimise the potential risk of grass fires on local communities and their livelihoods.

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
18.1. Ensure that open fires on the site for cooking or heating are not allowed except in designated areas.	The developer and contractors	During construction and operations
18.2. Provide adequate firefighting equipment onsite	The developer and contractors	During construction and operations
18.3. Provide fire-fighting training to selected construction staff.	The developer and contractors	During construction and operations
18.4. Compensate farmers / community members at full market related replacement cost for any losses, such as livestock, damage to infrastructure etc.	The developer and contractors	During construction and operations

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» Conditions contained in the Construction EMPr.</li> <li>» Designated areas for fires identified on site at the outset of the construction phase.</li> <li>» Fire fighting equipment and training provided before the construction phase commences.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» The proponent and or appointed ECO must monitor indicators listed above to ensure that they have been met for the construction phase.</li> </ul>

### 7.3. Detailing Method Statements

**OBJECTIVE 19. : To ensure all construction are undertaken with the appropriate level of environmental awareness to minimise environmental risk, in line with the specifications of the EMPr.**

The environmental specifications are required to be underpinned by a series of Method Statements, within which the Contractors and Service Providers are required to outline how any identified environmental risks will practically be mitigated and managed for the duration of the contract, and how specifications within this EMPr will be met. That is, the Contractor will be required to describe how specified requirements will be achieved through the submission of written Method Statements to the Site Manager.

A Method Statement is defined as "a written submission by the Contractor in response to the environmental specification or a request by the Site Manager, setting out the plant, materials, labour and method the Contractor proposes using to conduct an activity, in such detail that the Site Manager is able to assess whether the Contractor's proposal is in accordance with the Specifications and/or will produce results in accordance with the Specifications". The Method Statement must cover applicable details with regard to:

- » Details of the responsible person/s
- » Construction 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 Specifications, and
- » Any other information deemed necessary by the Site Manager.

Method Statements must be compiled for all activities which affect any aspect of the environment and should be applied consistently to all activities. Specific areas to be addressed in the method statement: pre, during and post construction include:

- » Site establishment (which explains all activities from induction training to offloading, construction sequence for site establishment and the different amenities and to be established etc. Including a site camp plan indicating all of these).
- » Preparation of the site (i.e. clearing vegetation, compacting soils and removing existing infrastructure and waste).

- » Soil management/stockpiling and erosion control.
- » Excavations and backfilling procedure.
- » Stipulate norms and standards for water supply and usage (i.e.: comply strictly to licence and legislation requirements and restrictions)
- » Stipulate the storm water management procedures recommended in the storm water management method statement.
- » Ablution facilities (placement, maintenance, management and servicing)
- » Solid Waste Management:
  - \* Description of the waste storage facilities (on site and accumulative).
  - \* Placement of waste stored (on site and accumulative).
  - \* Management and collection of waste process.
  - \* Recycle, re-use and removal process and procedure.
- » Liquid waste management:
  - \* The design, establish, maintain and operate suitable pollution control facilities necessary to prevent discharge of water containing polluting matter or visible suspended materials into rivers, streams or existing drainage systems.
  - \* Should grey water (i.e. water from basins, showers, baths, kitchen sinks etc.) need to be disposed of, link into an existing facilities where possible. Where no facilities are available, grey water runoff must be controlled to ensure there is no seepage into wetlands or natural watercourses.
- » Dust and noise pollution
  - \* Describe necessary measures to ensure that noise from construction activities is maintained within lawfully acceptable levels.
  - \* Procedure to control dust at all times on the site, access roads, borrow pits and spoil sites (dust control shall be sufficient so as not to have significant impacts in terms of the biophysical and social environments). These impacts include visual pollution, decreased safety due to reduced visibility, negative effects on human health and the ecology due to dust particle accumulation.
- » Hazardous substance storage (Ensure compliance with all national, regional and local legislation with regard to the storage of oils, fuels, lubricants, solvents, wood treatments, bitumen, cement, pesticides and any other harmful and hazardous substances and materials. South African National Standards apply).
  - \* Lists of all potentially hazardous substances to be used.
  - \* Appropriate handling, storage and disposal procedures.
  - \* Prevention protocol of accidental contamination of soil at storage and handling areas.
  - \* All storage areas, (i.e.: for harmful substances appropriately bunded with a suitable collection point for accidental spills must be implemented and drip trays underneath dispensing mechanisms including leaking engines/machinery).
- » Fire prevention and management measures on site.
- » Fauna and flora protection process on and off site (i.e. removal to reintroduction or replanting, if necessary).
  - \* Rehabilitation and re-vegetation process.

- » Incident and accident reporting protocol.
- » General administration
- » Designate access road and the protocol on while roads are in use.
- » Requirements on gate control protocols.

The Contractor may not commence the activity covered by the Method Statement until it has been approved by the Site Manager, except in the case of emergency activities and then only with the consent of the Site Manager. Approval of the Method Statement will not absolve the Contractor from their obligations or responsibilities in terms of their contract.

Failure to submit a method statement may result in suspension of the activity concerned until such time as a method statement has been submitted and approved. The ECO should monitor the construction activities to ensure that these are undertaken in accordance with the approved Method Statement.

#### **7.4. Awareness and Competence: Construction Phase of the Power Station**

**OBJECTIVE 20. : To ensure all construction personnel have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and on-going minimisation of environmental harm**

To achieve effective environmental management, it is important that Contractors are aware of the responsibilities in terms of the relevant environmental legislation and the contents of this EMPr. The Contractor is responsible for informing employees and sub-contractors of their environmental obligations in terms of the environmental specifications, and for ensuring that employees are adequately experienced and properly trained in order to execute the works in a manner that will minimise environmental impacts. The Contractors obligations in this regard include the following:

- » Employees must have a basic understanding of the key environmental features of the construction site and the surrounding environment.
- » Ensuring that a copy of the EMPr is readily available on-site, and that all site staff are aware of the location and have access to the document. Employees will be familiar with the requirements of the EMPr and the environmental specifications as they apply to the construction of the facility.
- » Ensuring that, prior to commencing any site works, all employees and sub-contractors have attended an Environmental Awareness Training course. The course must provide the site staff with an appreciation of the project's environmental requirements, and how they are to be implemented.

- » Basic training in the identification of archaeological sites/objects, paleontological sites, and protected flora and fauna that may be encountered on the site.
- » Awareness of any other environmental matters, which are deemed to be necessary by the ECO.
- » Ensuring that appropriate communication tools are used to outline the environmental "do's" and "don'ts" (as per the environmental awareness training course) to employees.
- » Records must be kept of those that have completed the relevant training.
- » Refresher sessions must be held to ensure the contractor's staff are aware of their environmental obligations.

### **7.5.1 Environmental Awareness Training**

Environmental Awareness Training must take the form of an on-site talk and demonstration by the ECO before the commencement of site establishment and construction on site. The education/awareness programme should be aimed at all levels of management and construction workers within the contractor team. A record of attendance of this training must be maintained by the ECO on site.

### **7.5.2 Induction Training**

Environmental induction training must be presented to all persons who are to work on the site – be it for short or long durations; Contractor's or Engineer's staff; administrative or site staff; sub-contractors or visitors to site.

This induction training should include discussing the developer's environmental policy and values, the function of the EMP and Contract Specifications and the importance and reasons for compliance to these. The induction training must highlight overall do's and don'ts on site and clarify the repercussions of not complying with these. The non-conformance reporting system must be explained during the induction as well. Opportunity for questions and clarifications must form part of this training. A record of attendance of this training must be maintained by the Contractors representative on site.

### **7.5.3 Toolbox Talks**

Toolbox talks should be held on a scheduled and regular basis (at least twice a month) where foremen, environmental and safety representatives of different components of the Works and sub-consultants hold talks relating to environmental practices and safety awareness on site. These talks should also include discussions on possible common incidents occurring on site and the prevention of reoccurrence thereof. Records of attendance and the awareness talk subject must be kept on file.

## 7.5. Monitoring Programme: Construction Phase of the Power Station

**OBJECTIVE 21.: To 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 Project Developer will determine and stipulate the period and frequency of monitoring required in consultation with relevant stakeholders and authorities. The Project Manager will ensure that the 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 updates based on audit outcomes, in order to enhance the efficacy of environmental management on site
- » Aid communication and feedback to authorities and stakeholders.

The Environmental Control Officer will ensure compliance with the EMPr, and to conduct monitoring activities. The Environmental Control Officer must have the appropriate experience and qualifications to undertake the necessary tasks. The Environmental Control Officer will report any non-compliance or where corrective action is necessary to the Site Manager and/or any other monitoring body stipulated by the regulating authorities.

The Environmental Control Officer (ECO) will ensure compliance with the environmental authorisation (EA), EMPr, relevant permits and licences and the environmental legislation during construction, and will conduct monitoring activities on a regular basis. An independent ECO must be appointed, and must have the appropriate experience and

qualifications to undertake the necessary tasks. The ECO will report any non-compliance or where corrective action is necessary to the Site Manager, DEA and/or any other monitoring body stipulated by the regulating authorities.

#### ***7.6.1. Non-Conformance Reports***

All supervisory staff including Foremen, Resident Engineers, and the ECO must be provided the means to be able to submit non-conformance reports to the Site Manager. Non-conformance reports will describe, in detail, the cause, nature and effects of any environmental non-conformance by the Contractor. Records of penalties imposed may be required by the relevant authority within 48 (forty eight) hours.

The non-conformance report will be updated on completion of the corrective measures indicated on the finding sheet. The report must indicate that the remediation measures have been implemented timeously and that the non-conformance can be closed-out to the satisfaction of the Site Manager and ECO.

#### ***7.6.2. Monitoring Reports***

A monitoring report will be compiled by the ECO on a monthly basis and must be submitted to DEA 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. Records relating to monitoring must be kept on site and made available for inspection to any relevant and competent authority in respect of this development.

#### ***7.6.3. Final Audit Report***

A final environmental audit report must be compiled by an independent auditor and be submitted to DEA upon completion of the construction and rehabilitation activities (within 30 days of completion of the construction phase (i.e.: within 30 days of site handover) and within 30 days of completion of rehabilitation activities. 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 EMPr. Records relating to audits must be kept on site and made available for inspection to any relevant and competent authority in respect of this development.



**MANAGEMENT PROGRAMME:  
 REHABILITATION OF DISTURBED AREAS**

**CHAPTER 8**

**8.1. Overall Goal for the Rehabilitation of Disturbed Areas**

**Overall Goal for the Rehabilitation of Disturbed Areas:** Undertake the rehabilitation measures in a way that:

- » Ensures rehabilitation of disturbed areas following the execution of the works, such that residual environmental impacts are remediated or curtailed

**8.2. Objectives**

In order to meet this goal, the following objective, actions and monitoring requirements are relevant:

**OBJECTIVE 22. : Appropriate rehabilitation of disturbed areas following the execution of the works, such that residual environmental impacts are remediated or curtailed**

Areas requiring rehabilitation will include all areas disturbed during the construction phase and that are not required for regular maintenance operations. Rehabilitation should be undertaken in an area as soon as possible after the completion of construction activities within that area. This is therefore an on-going activity and may commence while construction is still underway in other areas.

<b>Project component/s</b>	<ul style="list-style-type: none"> <li>» Power Station Plant</li> <li>» Lay down areas</li> <li>» Substation site</li> <li>» Access roads not required for operation and maintenance</li> <li>» Power line servitude</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Environmental integrity of site undermined resulting in reduced visual aesthetics, erosion, compromised land capability and the requirement for on-going management intervention</li> </ul>
<b>Activity/risk source</b>	<ul style="list-style-type: none"> <li>» Temporary laydown areas</li> <li>» Temporary access roads/tracks</li> <li>» Other disturbed areas/footprints</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» To ensure and encourage site rehabilitation of disturbed areas</li> <li>» To ensure that the site is appropriately rehabilitated following the execution of the works, such that residual environmental impacts (including erosion) are remediated or curtailed</li> </ul>

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
22.1. All temporary facilities, equipment and waste materials must be removed from site as soon as practically possible after construction is complete.	Contractor	Following execution of the works
22.2. All temporary fencing and danger tape must be removed once the construction phase has been completed.	Contractor	Following completion of construction activities in an area
22.3. Necessary anti-erosion measures must be installed, where required, to minimise loss of topsoil and control erosion.	Contractor	Following completion of construction activities in an area
22.4. Disturbed areas must be rehabilitated/re-vegetated with appropriate natural vegetation and/or local seed mix. Re-use of native/indigenous plant species that were removed from disturbance areas in the rehabilitation phase.	Contractor in consultation with specialist/ suitable qualified person	Following completion of construction activities in an area
22.5. Re-vegetated areas may have to be protected from wind erosion and maintained until an acceptable plant cover has been achieved.	The Project Developer in consultation with a specialist/ suitable qualified person	Post-rehabilitation
22.6. All open spaces created through the construction process must be re-vegetated and rehabilitated in a manner recommended by the Rehabilitation Plan developed in the pre-construction phase.	The Project Developer in consultation with rehabilitation specialist	Pre and Post-rehabilitation
22.7. Any stockpiles should be re-vegetated to stabilise the soil, reduce run-off and minimise erosion.	Contractor	Following completion of construction activities in an area

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» All portions of site, including construction equipment camp and working areas, cleared of equipment and temporary facilities</li> <li>» Topsoil replaced on all areas and stabilised</li> <li>» Disturbed areas rehabilitated and acceptable plant cover achieved on rehabilitated sites</li> <li>» Completed site free of erosion and alien invasive plants</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» On-going inspection of rehabilitated areas in order to determine effectiveness of rehabilitation measures implemented</li> </ul>

**MANAGEMENT PROGRAMME:  
 OPERATION**

**CHAPTER 9**

**9.1. Overall Goal for Operation**

**Overall Goal for Operation:** To ensure that the operation of the power station does not have unforeseen impacts on the environment and to ensure that all impacts are monitored and the necessary corrective action taken in all cases. In order to address this goal, it is necessary to operate the power station in a way that:

- » Ensures that operation activities are properly managed in respect of environmental aspects and impacts.
- » Enables the operation activities to be undertaken without significant disruption to other land uses in the area, in particular with regard to noise impacts, farming practices, traffic and road use, and effects on local residents.

**9.2. Objectives**

In order to meet this goal, the following objectives have been identified, together with necessary actions and monitoring requirements.

**OBJECTIVE 23. : Prevention of any further impact on flora, fauna and ecosystems**

<b>Project component/s</b>	All infrastructure including: <ul style="list-style-type: none"> <li>» power station</li> <li>» access roads</li> <li>» substation</li> <li>» power line</li> <li>» ash dump</li> </ul>
<b>Potential Impact</b>	Ecosystem break down and loss of biodiversity
<b>Activity/Risk Source</b>	<ul style="list-style-type: none"> <li>» Operation of the power plant and associated infrastructure</li> <li>» Movement of employee vehicles within and around site.</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» To maintain minimised footprints of disturbance of vegetation/habitats on-site.</li> <li>» To ensure and encourage plant regrowth in non-operational areas of post-construction rehabilitation.</li> </ul>

Mitigation: Action/control	Responsibility	Timeframe
23.1. Restrict maintenance activities to footprint of	The Project Developer	Operation

Mitigation: Action/control	Responsibility	Timeframe
power station and power line.		
23.2. Implement a biodiversity monitoring programme for all components of the project.	The Project Developer	Operation
23.3. Implement an Air Quality Management Plan, including a dust management programme and emissions emission control and reduction strategy.	The Project Developer	Operation
23.4. Implement an appropriate alien and invasive management programme for all components of the project	The Project Developer	Operation
23.5. Implement an Integrated Water Resource Management Plan	The Project Developer	Operation
23.6. Implement a Water Demand and Conservation Plan for the power station operation.	The Project Developer	Operation
23.7. Implement surface and groundwater monitoring programmes to monitor impacts on water quality.	The Project Developer	Operation
23.8. Implement a Zero Liquid Effluent Discharge (ZLED) policy for the power station	The Project Developer	Operation
23.9. Independent environmental audits to be conducted during the operational phase at a monitoring frequency to be determine by the DEA.	Independent environmental auditor	Operation Recommend bi-annual audits for first two years and then annually thereafter

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» All plans are appropriately implemented.</li> <li>» Impacts on surrounding environment is minimised as far as possible.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» The Environmental Manager will keep records of the impacts and mitigation measures implemented during the operational phase.</li> <li>» Independent environmental auditing during the operational phase.</li> </ul>

## OBJECTIVE 24. : Protect Surface Water Resources

<b>Project component/s</b>	Construction of all infrastructure including: <ul style="list-style-type: none"> <li>» power station</li> <li>» ash dump</li> <li>» coal stockpile</li> <li>» pollution control dams</li> </ul>
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<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Surface Water contamination</li> <li>» Ash disposal to potentially degrade surface and groundwater resources</li> <li>» Accidental spills could lead to water pollution</li> <li>» Runoff from coal stockpiles, ashing plant area and power station surface infrastructure to pollute water resources</li> </ul>
<b>Activities/risk sources</b>	<ul style="list-style-type: none"> <li>» Ash dam management</li> <li>» coal stockpile management</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» Operate a Zero Effluent Discharge Facility</li> <li>» Limit impacts on surface water resources</li> </ul>

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
24.1. Obtain water use licence for the operation of the power plant	Project Developer	Operation
24.2. Implement an appropriate surface water monitoring programme.	Project Developer	Operation
24.3. Dirty and clean stormwater should be separated systems. Dirty stormwater to be contained	Project Developer	Operation
24.4. Where storm water enters the water resource, sediment and debris trapping, as well as energy dissipation control structures should be put in place.	Project Developer	Operation
24.5. Litter traps should be incorporated into the stormwater designs to ensure that litter runoff from the site cannot enter the Mokolo River catchment or other tributaries (Sandloop) directly.	Project Developer	Operation
24.6. The possibility of spillages should be catered for in the design of the infrastructure development where, pollution control dams or attenuation ponds could contain water prior to the discharge.	Project Developer	Operation
24.7. Storm water systems to be designed in such a way that it can be easily sealed off after the occurrence of a spill. If a spill occurs during the operational phase of the water use, a qualified team of experts will need to be consulted, rehabilitation plan drawn up and implemented and the Regional DWA Office should be informed immediately.	Project Developer	Operation
24.8. Good housekeeping (clean-up of spills and minimise informal storage of materials)	Project Developer	Operation
24.9. Run off will be contained in paddocks for collection and evaporation or run off will be captured in the drain system and channelled to the pollution control dams.	Project Developer	Operation

Mitigation: Action/control	Responsibility	Timeframe
24.10. Monitor seepage at the pollution control dams on a quarterly basis.	A suitably qualified person appointed by The Project Developer	Operation

<b>Performance Indicator</b>	» Issued water use license and external audit report indicating 100% compliance with water use licence conditions
<b>Monitoring</b>	» Surface water quality monitoring and monitoring reports

### OBJECTIVE 25. : Manage impacts on ground water

<b>Project component/s</b>	<ul style="list-style-type: none"> <li>» ash dumps</li> <li>» coal stock piles</li> <li>» power station plant</li> <li>» pollution control dams</li> <li>» evaporation ponds</li> </ul>
<b>Potential Impact</b>	Groundwater pollution
<b>Activities/risk sources</b>	Ash dump management
<b>Mitigation: Target/Objective</b>	Avoid/ keep ground water impacts an absolute minimum

Mitigation: Action/control	Responsibility	Timeframe
25.1. Maintain liners of ash dump, coal stockpile and pollution control dams on a continual basis and rectify any areas which may be compromised as soon as possible.	Project Developer	Operation
25.2. Regular sampling and chemical analyses of the groundwater is imperative to establish a sound database: <ul style="list-style-type: none"> <li>* Groundwater in all boreholes made available for monitoring, within a distance of less than two kilometres must be sampled regularly to establish a database against which future groundwater levels can be compared.</li> <li>* Sampling must preferably be quarterly, but at least twice annually, following the dry – and rainy seasons.</li> </ul>	A suitably qualified person appointed by The Project Developer	Quarterly
25.3. Groundwater sampling must performed to establish a database of plume movement trends, to aid eventual decommissioning and	A suitably qualified person appointed by The Project	Preferably Quarterly

Mitigation: Action/control	Responsibility	Timeframe
rehabilitation of the power station.	Developer	
25.4. Water samples must be taken from all the monitoring boreholes by using approved sampling techniques and adhering to recognised sampling procedures. Samples should be analysed for both organic as well as inorganic pollutants, as activities at power stations often lead to hydrocarbon spills in the form of diesel and oil.	A suitably qualified person appointed by The Project Developer	Preferably Quarterly
25.5. If it is found during such a sampling event that groundwater from any extraction borehole is polluted beyond acceptable standards, alternative water will have to be supplied to the affected party by the Project Developer.	A suitably qualified person appointed by The Project Developer	As and when required
25.6. Additional mitigation measures guided by DWAF's best practice guidelines of July, 2008 should also be implemented.	A suitably qualified person appointed by The Project Developer	As and when required

<b>Performance Indicator</b>	» Limited ground water impacts from the power station activities.
<b>Monitoring</b>	» Ground water monitoring by a suitably qualified specialist on a regular basis (preferably quarterly but at least bi-annually).

### OBJECTIVE 26. : Ensure good management of the environmental impacts of the ash dams and coal stockpile

There are two major contamination pathways from the ash dump and coal stockpile which are surface-runoff and seepage. Prevention/Management measures to management the impacts of the two major contamination pathways is discussed below.

<b>Project component/s</b>	» Ash dumps » Coal stockpile
<b>Potential Impact</b>	» Ground water pollution » Surface water pollution
<b>Activities/risk sources</b>	» Ash management » Coal stock pile management
<b>Mitigation: Target/Objective</b>	» No / limited surface and ground water pollution due to ash dumps and coal stock piles

Mitigation: Action/control	Responsibility	Timeframe
26.1. Construction of spillways: Spillways generally are	Project Developer	Operation

Mitigation: Action/control	Responsibility	Timeframe
<p>designed as temporary structures because they will change (i.e., be moved or increased in length) as raised embankments increase in height. They are constructed of an impervious material able to withstand rapid flow velocities. The spillway also is designed to contain and control hydraulic jumps that occur at the bottom of the spillway. In addition, a spillway design has to consider and plan for water treatment if the surface water runoff passes through the ash dump or stockpile.</p>		
<p>26.2. Containment of Storm Water: All water that falls within the catchment area of the stockpile and ash dump must be retained within the area. Water that has been in contact with coal material, and must therefore be considered polluted, must be kept within the confines of the power station until evaporated, treated to rendered acceptable for release, or re-used in some other way. It should be based on the average monthly rainfall for the area concerned less the gross mean evaporation in the area plus the maximum precipitation to be expected over a 24 hour period with a frequency of once in 50 years.</p>	Project Developer	Operation
<p>26.3. Material from the stockpile and ash dump should be submitted for geochemical analysis to determine the leachability, acid generation capacity and contamination potential of each.</p>	Project Developer	Operation
<p>26.4. Seepage is the movement of water (contaminated and uncontaminated) through and around the stockpile and ash dump on site. Primary factors affecting the volume of seepage present in a system are depth to the groundwater table and infiltration capacities of the unsaturated zone and stockpiles. Assuming that the facilities have no lining present and no mitigation measures are in place to control seepage, the possibility of a pump and treat system could be investigated if monitoring data indicates that sulphate contamination is increasing beyond acceptable levels in groundwater. The reason for this mitigation option is due to the thickness of the unsaturated zone in this area, rendering other options such as cut off trenches, unfeasible. Seepage from these facilities may also take an</p>	Project Developer	Operation



Mitigation: Action/control	Responsibility	Timeframe
extended period of time to reach the phreatic surface due to its depth and the thickness of the unsaturated zone.		
<p>26.5. Due to the possibility of groundwater contamination, quarterly groundwater sampling must be done to establish a database of plume movement trends. Water samples must be taken from all the monitoring boreholes by using approved sampling techniques and adhering to recognised sampling procedures. Samples should be analysed for both organic as well as inorganic pollutants, as activity at power stations often lead to hydrocarbon spills in the form of diesel and oil. At least the following water quality parameters should be analysed for:</p> <ul style="list-style-type: none"> <li>* Major ions (Ca, K, Mg, Na, SO<sub>4</sub>, NO<sub>3</sub>, Cl, F)</li> <li>* pH</li> <li>* Electrical Conductivity (EC),</li> <li>* Total Petroleum Hydrocarbons (TPH)</li> <li>* Total Alkalinity</li> </ul> <p>These results should be recorded on a data sheet. It is proposed that the data should be entered into an appropriate computer database and reported to the Department of Water Affairs and Forestry.</p>	A suitably qualified person appointed by The Project Developer	Quarterly during the operation of the power station

<b>Performance Indicator</b>	» Limited surface and ground water pollution due to ash dumps and coal stock piles
<b>Monitoring</b>	» Quarterly groundwater sampling and monitoring reports. » The environmental manager / suitably qualified person to monitor groundwater impacts

## OBJECTIVE 27. : Manage air emissions

<b>Project component/s</b>	» Ash dumps » Coal stock piles » Emissions from power station
<b>Potential Impact</b>	» Air pollution » Human health impacts
<b>Activities/risk sources</b>	» Power station operation » Ash management » Coal stock pile operations

<b>Mitigation:</b>	» Limit air emissions
<b>Target/Objective</b>	

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
27.1. Obtain Air Emissions Licence prior to commencement of operation	Project Developer	Prior to operation
27.2. Comply to the conditions of the air emissions licence throughout operational phase.	Project Developer	Operation
27.3. Implement a dust mitigation plan and undertake regular dust monitoring.	Project Developer	Operation
27.4. Implement an emission control and reduction strategy that aims to ensuring that the contribution to ambient concentrations is minimised.	Project Developer	Operation
27.5. Conduct air emissions monitoring	A suitably qualified person appointed by The Project Developer	Frequency to be determined by AEL
27.6. The sidewalls of the ash dump should be vegetated as they rise, and the vegetation cover should be maintained to reduce the exposed area and limit wind entrainment.	Project Developer	Operation
27.7. The top of the ash dump must be kept moist to bind the surface dust and prevent wind entrainment of dust.	Project Developer	Operation
27.8. Roads should be tarred or traffic control measures implemented to limit vehicle-entrained dust from unpaved roads e.g. by limiting vehicle speeds and by restricting traffic volumes. Unpaved road surfaces should be sprayed with a surfactant to ensure high moisture content which will bind the silt.	Project Developer	Operation

<b>Performance Indicator</b>	Compliance with the conditions of the air emission's licence.
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Emissions monitoring reports</li> <li>» Dust monitoring reports</li> <li>» Annual independent environmental auditing</li> </ul>

## **OBJECTIVE 28. : Control noise from the power station plant**

Projected noise levels during operation of the proposed development were modelled using the methodology as proposed by SANS 10357:2004. The resulting current and

future noise projections indicated that the operation of the facility would comply with the Noise Control Regulations (GN R154) and the SANS 10103:2008 guidelines during the day and night-time hours (worst-case scenario). The results of the study indicate that there is a low potential of a noise impact during the operational phase. No mitigation or routine noise monitoring is therefore required. However, appropriate management measures are required to be implemented in order to minimise the potential for impacts.

<b>Project component/s</b>	<ul style="list-style-type: none"> <li>» Cooling fans</li> <li>» Heavy machinery</li> <li>» Heavy vehicles and trucks</li> <li>» Operational staff</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Noise and disturbances</li> </ul>
<b>Activities/risk sources</b>	<ul style="list-style-type: none"> <li>» Operation of the power station 24 hours a day</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» Ensure that the change in ambient sound/Rating levels as experienced by receptors is less than 5 dBA;</li> <li>» Prevent the generation of nuisance noises; and</li> <li>» Ensure acceptable noise levels at surrounding stakeholders and receptors.</li> </ul>

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
28.1. Should any valid noise complaints registered relating to the operation of the power station noise measurements should be conducted as recommended by an acoustical consultant.	Acoustical Consultant / suitably qualified person appointed by The Project Developer	As and when required during operation
28.2. If noise measurements are conducted annual feedback should be presented to all stakeholders and other Interested and Affected parties in the area.	Acoustical Consultant / suitably qualified person appointed by The Project Developer	As and when required during operation
28.3. The findings of the noise report should also be made available to all potentially noise-sensitive developments in the area with the contents explained to them to ensure that they understand all the potential risks that the development may have on them and their families.	Acoustical Consultant / suitably qualified person appointed by The Project Developer	As and when required during operation

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» No noise complaints from the public or adjacent landowners</li> <li>» Ensure that maximum noise levels at potentially sensitive receptors are less than 65 dBA</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» No routine noise measurements recommended.</li> <li>» Environmental manager/ Power Station to maintain a complaints</li> </ul>

register

**OBJECTIVE 29. : Traffic management during operation**

<b>Project component/s</b>	<ul style="list-style-type: none"> <li>» Vehicles</li> <li>» Operation Staff</li> <li>» Trucks and heavy vehicles / abnormal loads transporting limestone and other goods</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Traffic congestion</li> <li>» Risk of accidents</li> <li>» Deterioration of road pavement conditions (both surfaced and gravel road) due to abnormal loads</li> </ul>
<b>Activity/risk source</b>	<ul style="list-style-type: none"> <li>» Transportation of limestone to the site via road</li> <li>» Daily commuting of operational staff to the power station</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» To minimise impact of traffic associated with the operation of the power station .</li> <li>» To minimise potential for negative interaction between pedestrians or sensitive users and traffic associated with the power station.</li> </ul>

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
29.1. All relevant permits for abnormal loads must be applied for from the relevant authority as required.	Project Developer	As and when required
29.2. Designated accesses to the proposed site must be created to ensure safe entry and exit.	Project Developer	Operation
29.3. Appropriate road management strategies must be implemented on internal roads with all employees and contractors required to abide by standard road and safety procedures.	Project Developer	Operation
29.4. Any traffic delays as a result of the power station operation must be co-ordinated with the appropriate authorities.	Project Developer	Operation
29.5. Appropriate road signage must be established at and road markings appropriate points warning of turning traffic and the power station site entrance (all signage to be in accordance with prescribed standards and must be appropriately maintained throughout the operational phase)	Project Developer	Operation

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» No traffic incidents involving the power station vehicles.</li> <li>» Appropriate signage in place</li> <li>» No complaints resulting from traffic congestion, delays or driver negligence associated with power station.</li> </ul>
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<b>Monitoring</b>	<ul style="list-style-type: none"> <li>» Visual monitoring of dust produced by traffic movement</li> <li>» Visual monitoring of traffic control measures to ensure they are effective</li> <li>» A complaints register will be maintained, in which any complaints from the community will be logged. Complaints will be investigated and, if appropriate, acted upon</li> </ul>
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**OBJECTIVE 30.: Limit the visual impacts of the power station and associated infrastructure**

The primary visual impact, namely the appearance of the power station and ancillary infrastructure is not possible to mitigate. The functional design of the power station cannot be changed in order to reduce visual impacts. The following mitigation is, however possible.

<b>Project component/s</b>	<ul style="list-style-type: none"> <li>» power station</li> <li>» ancillary infrastructure (i.e. ash dam, access roads, substation, power line, security lighting, workshop, offices, etc.).</li> </ul>
<b>Potential Impact</b>	Visual impact of facility degradation and vegetation rehabilitation failure.
<b>Activities/risk sources</b>	The viewing of the above mentioned by observers on or near the site (within 3km).
<b>Mitigation: Target/Objective</b>	Well maintained and neat facility.

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
30.1. Maintain the general appearance of the facility as a whole, including the power station, servitudes and the ancillary structures.	Project Developer	Operation
30.2. Maintain roads and servitudes to forego erosion and to suppress dust.	Project Developer	Operation
30.3. Monitor rehabilitated areas, and implement remedial action as and when required.	Project Developer	Operation
30.4. Implement and maintain green buffer zones surrounding the power station.	Project Developer	Operation
30.5. Maintain existing vegetation cover in all areas outside of the actual development footprint.	Project Developer	Operation

Mitigation: Action/control	Responsibility	Timeframe
30.6. Mitigation of lighting impacts. Mitigation measures could include any of the following: <ul style="list-style-type: none"> <li>* Shielding the sources of light by physical barriers (walls, vegetation, or the structure itself);</li> <li>* Limiting mounting heights of lighting fixtures, or alternatively using foot-lights or bollard level lights;</li> <li>* Making use of downward directional lighting fixtures;</li> <li>* Making use of minimum lumen or wattage in fixtures;</li> <li>* Making use of down-lighters, or shielded fixtures;</li> <li>* Making use of Low Pressure Sodium lighting or other types of low impact lighting.</li> <li>* Making use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes.</li> </ul>	Project Developer	Operation
30.7. During operation, the maintenance of the power station and ancillary structures and infrastructure will ensure that the facility does not degrade, thus aggravating visual impact/landscape scarring.	Project Developer	Operation
30.8. If required, where sensitive visual receptors are likely to be affected, it is recommended that the developer enter into negotiations regarding the potential screening of visual impacts, either at the receptor site or along the perimeter of the facility. This may entail the planting of vegetation or the construction of landscaped berms or screens at the visual receptor.	Project Developer	Operation

<b>Performance Indicator</b>	Well maintained and neat facility with intact vegetation on and in the vicinity of the facility.
<b>Monitoring</b>	Monitoring of the entire site on an ongoing basis

**OBJECTIVE 31. : Manage social impacts or disturbances due to the operation of the power station**

<b>Project component/s</b>	Operation and maintenance of the power station
<b>Potential Impact</b>	Loss of opportunities to stimulate production and employment of the local economy
<b>Activities/risk sources</b>	Labour and procurement practices employed during operations
<b>Mitigation: Target/Objective</b>	Maximise the production, and local community employment benefits in the local economy

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
31.1. The operator of the power station should be encouraged to procure materials, goods and services required for the operation of the facility from local suppliers to increase the positive impact in the local economy as far as possible.	Project Developer	Operation
31.2. Where possible, the local labour should be considered for employment to increase the positive impact on the local economy.	Project Developer	Operation
31.3. Where possible train and empower local communities for employment in the operations of the power station.	Project Developer	Operation
31.4. Implement an apprenticeship programme to build onto existing or develop new skills of construction workers, especially those coming from the local communities.	Project Developer	Operation
31.5. Profit generated by the project supported through the social responsibility programme should be considered for re-investment in the community to create new businesses and generate more wealth for the community members.	Project Developer	Operation
31.6. The operator of the power station should be encouraged to procure materials, goods and services required for the operation of the facility from local suppliers to increase the positive impact in the local economy as far as possible.	Project Developer	Operation
31.7. Implement a social and economic development programme	Project Developer	Operation
31.8. Compensate landowners for proven losses. Agreements should be reached through negotiations so that developers can try to offset potential losses in property values.	Project Developer	Operation

<b>Performance Indicator</b>	<ul style="list-style-type: none"><li>» Number of contracts and percentage of contract values allocated to local SMEs and companies</li><li>» Number of people attending vocational training on an annual basis</li><li>» Percentage of workers that were employed from local communities</li><li>» Social and economic development programme that takes into account local policies, priorities and needs</li><li>» Consultation with local authorities and communities on the social and economic needs and priorities</li><li>» Percentage of profits reinvested back into local communities</li><li>» Number of successful SME's initiated by CSI programmes</li></ul>
<b>Monitoring</b>	Environmental manager to collect information and to provide report in operational phase audit reports



**MANAGEMENT PROGRAMME:  
 DECOMMISSIONING**

**CHAPTER 10**

The lifespan of the proposed coal-fired power station is more than 25 years. Equipment associated with this facility would only be decommissioned once it has reached the end of its economic life. It is most likely that decommissioning activities of the infrastructure of the facility discussed in this EIA would comprise the disassembly and disposal of the infrastructure. Decommissioning activities will involve disassembly of the production units and ancillary infrastructure, demolishing of buildings, removal of hazardous waste and rehabilitation of the ash dumps and site. The decommissioning activities would need to comply with the legislation relevant at the time.

Should the activity ever cease or become redundant, the applicant shall undertake the required actions as prescribed by legislation at the time and comply with all relevant legal requirements administered at any relevant and competent authority at that time.

**OBJECTIVE 32. : To avoid and or minimise the potential impacts associated with the decommissioning phase**

<b>Project component/s</b>	» Decommissioning of the power station and associated infrastructure.
<b>Potential Impact</b>	» Decommissioning will result in job losses, which in turn can result in a number of social impacts. » Decommissioning is also similar to the construction phase in that it will also create temporary employment opportunities. » Decommissioning can cause environmental impacts.
<b>Activity/risk source</b>	» Decommissioning of the power station and associated infrastructure.
<b>Mitigation: Target/Objective</b>	» To avoid and or minimise the potential social and environmental impacts associated with decommissioning of the power station.

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
32.1. Retrenchments should comply South African labour legislation of the day	Project Developer	Decommissioning.
32.2. Rehabilitation to be undertaken in terms of specifications outlined in the Rehabilitation Section of this EMP (Chapter 8) as well as in terms of any specific requirements applicable at the time.	Project Developer	Decommissioning.
32.3. Once the facility has exhausted its life span, the main facility and all associated	Project Developer	Decommissioning.

Mitigation: Action/control	Responsibility	Timeframe
<p>infrastructure not required for the post rehabilitation use of the site should be removed and all disturbed areas appropriately rehabilitated. An ecologist should be consulted to give input into rehabilitation specifications.</p>		
<p>32.4. All rehabilitated areas should be monitored for at least a year following decommissioning, and remedial actions implemented as and when required.</p>	Project Developer	Decommissioning.
<p>32.5. Rehabilitation of the site should start immediately after decommissioning is completed.</p>	Project Developer	Decommissioning
<p>32.6. All excavations must be rehabilitated with soil and topsoil, which should not contain invasive plant species</p>	Project Developer	Decommissioning
<p>32.7. Re-vegetation specifications to be developed.</p>	Project Developer	Decommissioning
<p>32.8. All building materials must be removed from the site. All compacted surfaces must be ripped and re-vegetated as per the re-vegetation specifications.</p>	Project Developer	Decommissioning
<p>32.9. Rehabilitation to be conducted in a progressive manner (i.e. once decommissioning in an area has been completed the area will be rehabilitated). The rehabilitation of the area with indigenous vegetation must coincide with the rainfall events and all alien invasive vegetation shall be removed.</p>	Project Developer/ appointed Contractor	Decommissioning
<p>32.10. Rehabilitation measures for the site are to include the following:</p> <ul style="list-style-type: none"> <li>» Re-contouring Subsoil stockpiles should be used to re-contour construction affected areas. The Contractor shall restore the profile, soil condition and landform to as close as possible state to the pre-construction state.</li> <li>» Scarification and ripping All areas where rehabilitation interventions are required shall be cross-ripped before topsoil placement. Topsoil and fertile soil shall be uniformly scarified to allow for vegetation growth</li> <li>» Fertilising The Contractor shall be required to perform soil analysis tests on the top 75mm of prepared surface prior to re-vegetation/seeding to</li> </ul>	Project Developer/ appointed Contractor	Decommissioning

Mitigation: Action/control	Responsibility	Timeframe
determine the required fertiliser levels for permanent cover. » Seed acquisition The Contractor shall purchase seed from a South African National Seed Organisation (SANSOR) accredited dealer.		
32.11. Schedule works for placing of topsoil once all infrastructure has been successfully decommissioned. Seeding can then take place after the first rains of the season and should be concluded by one month before the end of the growing season.	Project Developer/ appointed Contractor	Decommissioning
32.12. The seed mix for use in rehabilitation must be an approved mix of indigenous grass species common to the area.	Project Developer/ appointed Contractor	Decommissioning
32.13. Maintain rehabilitated areas free of weeds and invader plants until the end of the Defects Notification Period applicable to rehabilitation. Control of weeds and invader plants must be done in accordance with the specifications stipulated in the CARA.	Project Developer/ appointed Contractor	Decommissioning
32.14. Implement appropriate measures to erosion in areas impacted upon by their activities. All erosion repairs must be implemented at the first signs thereof and no erosion shall be allowed to develop on a large scale.	Project Developer/ appointed Contractor	Decommissioning
32.15. All recyclable rubble and solid waste (e.g. scrap metal, cables, bottles, cans, and plastic residues) shall be collected and disposed of through a registered recycling company. Waste manifests will be kept by the Contractor and shown to the ECO on request.	Project Developer/ appointed Contractor	Decommissioning
32.16. All non-recyclable rubble and solid waste shall be collected and disposed of at an approved waste disposal site. Waste manifests will be shown to the ECO on request.	Project Developer/ appointed Contractor	Decommissioning
32.17. Prepare a Rehabilitation Close-Out Report	Project Developer/ appointed Contractor	Post- Decommissioning
<b>Performance Indicator</b>	» South African Labour legislation at the relevant time » Successful re-vegetation and rehabilitation of the site	
<b>Monitoring</b>	» Rehabilitation undertaken in accordance with the EMPr » Monitoring of Rehabilitation by ECO b& Rehabilitation Close-Out Report	

