Environmental Management Programme (EMPr)

Relocation of the Blurock Quarry's Powerline

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Authors Ludloko Developments cc

Applicant Blurock Quarries (Pty) Ltd

Contact Jeremy Hunter-Smith

Telephone 082 492 8957

Email <u>jeremy@brd.co.za</u>

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1.0 Project Background

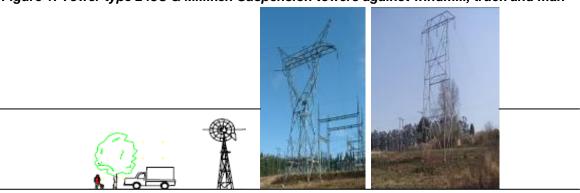
The applicant, Blurock Quarry proposes to deviate approximately 2.2 km of the existing 1 Colenso/Gowrie 88kV powerline.

This deviation will include the following activities:

- Erection of new towers required for the deviation at intervals along the proposed route;
- Foundations for the towers;
- Stringing of lines between towers;
- Removal of 2.2km of existing powerline and towers.

The powerline will have a dedicated servitude of 32km and tower height can range from 15m to 25m. One of the following tower designs will be used for the deviation:

Figure 1: Tower type 248C & Milliken Suspension towers against windmill, truck and man



The affected portion of the powerline is situated on the outskirts of the town of Estcourt. Estcourt is a town in the <u>uThukela District</u> of <u>KwaZulu-Natal Province</u>. This portion of the powerline and the proposed deviation route are situated on the east of Klein Boesman's river and north of Boesman's river.

2.0 Site Description

Geographically the portion of the powerline to be deviated starts at 2900'27.55"S;29053'25.61"E and will end at 29069'59.68S; 29052'43.04"E (see figure 2). The preferred deviation route is located within an approved mining site (Reference Number: KZN30/5/1/2/2/276MR), bound by existing mining activities to the South, open natural grassland to the North, the town of Estcourt to the South and West and the Klein Boesman's river to the East.

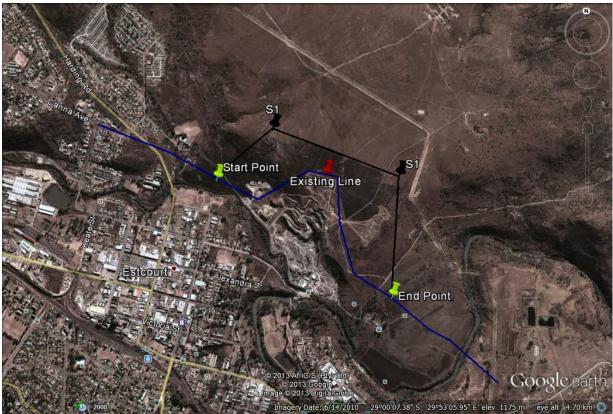


Figure 2: Map showing the existing route in blue, the preferred deviation route in black as well as the start and end points of the deviated line

3.0 Purpose of the EMPr

An Environmental Management Plan (EMP) can be defined as "an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented; and that the positive benefits of the projects are enhanced". EMPr's are therefore important tools for ensuring that the management actions arising from Environmental Impact Assessment (EIA) processes are clearly defined and implemented through all phases of the project life-cycle¹.

The EMPr is intended to be used as a stand-alone document that translates mitigation measures into actions that can be practically implemented during pre-construction, construction and operational activities. As such the EMPr aims to mitigate and manage construction, operational and decommissioning activities and any negative impacts that these activities may have on the surrounding environment. Key to this is assigning the responsibilities to personnel at each stage, developing mitigation measures that can translate into action plans and regular auditing of these mitigation measures.

¹ Source: DEA&DP (2005). Guideline for Environmental Management Plans (EMPs). Provincial Government of Western Cape. Online: http://www.westerncape.gov.za/Text/2005/7/deadp_emp_guideline_june05_5.pdf

4.0 EAP Details

5.0 Roles and Responsibility

The following roles and responsibilities are defined:

Personnel	Role	Responsibility
Applicant	The person or organisation proposing the project or activity.	 Ensuring that the engineer and contractors comply with the approved EMPr. Ensuring compliance with the provisions for duty of care and remediation of damage in accordance with section 28 of the National Environmental Management Act (NEMA), (No. 107 of 1998) and its obligations regarding the control of emergency incidents in terms of Section 30 of NEMA. Notifying DAEA&RD of any incident as defined in subsection 30(1)(a) of NEMA. Where construction or operation activities are contracted out (eg. to Contractors and Subcontractors), the liability associated with non-compliance still rests with the Applicant (unless otherwise agreed upon between the authorities, the Applicant and the contracting parties).
Project Manager	Project Manager is appointed by the applicant who has over-all responsibility for managing the Contractors and for ensuring that the environmental management requirements are met.	 Appointing the appropriately qualified contractor. Ensuring that the work undertaken is properly and competently directed, guided and executed at appointed stages of the project. Ensuring the adherence to statutory safety, health and environment (SHE) standards. Ensuring the construction activities comply with the EMPr. Monitoring the site on a daily basis to ensure compliance. Overall responsibility and accountability for the site during the construction phase. Avoiding and/or mitigating adverse impacts

- on the environment by the appropriate design and construction.
- Ensuring transparency in operation and environmental management of the site.
- Ensuring that the contractor has a copy of the EMPr and all agreed Method Statements.

Contractor Contractor representative

/ Person / company appointed by the Applicant to undertake the construction work. • As part of implementing the management actions, Method Statements should be prepared by the Contractor and/or Subcontractor. These Method Statements should specify how they will manage potential environmental impacts in line with the requirements of the EMPr, and, where relevant, environmental best practice; and how they will practically ensure that the objectives of the EMPr are achieved.

EAP / ECO

A person to monitor that the EMPr requirements are implemented. For the construction phase, this person is usually appointed by the Applicant

- Maintenance, update and review of the EMPr.
- Liaison between the Project Proponent,
 Contractors, authorities and other lead
 stakeholders on all environmental concerns.
- Compilation and administration of an environmental monitoring plan to ensure that the environmental management measures are implemented and are effective.
- Monitoring the performance of the Contractor (and Sub-contractors) and ensuring compliance with the EMP and associated Method Statements.
- Validating the regular site inspection reports, which are to be prepared by the Contractor's
- Checking the EO's record of environmental incidents (spills, impacts, legal transgressions, etc.) as well as corrective and preventive actions taken.
- Checking the EO's public complaints register in which all complaints are recorded, as well as action taken.

- Issuing of site instructions to the Contractor for corrective actions required.
- Assisting in the resolution of conflicts.
- Communication of all modifications to the EMP to the relevant stakeholders.
- Conducting regular audits to ensure that the system for implementing the EMPr is operating effectively.

EO Appointed by the Contractor to coordinate environmental management activities of the

Contractor on site.

- Support the ECO in the monitoring and execution of the Contractors or Subcontractors' Method Statements maintaining a permanent presence on site.
- Inspect the site as required to ensure adherence to the management actions of the EMP and the Method Statements.
- Complete Site Inspection Forms on a regular basis (eg. daily or weekly).
- Provide inputs to the regular (eg. monthly) environment report to be prepared by the ECO.
- Liaise with the construction team on issues related to implementation of, and compliance with, the EMP.
- Maintain a record of environmental incidents (spills, impacts, legal transgressions, etc.) as well as corrective and preventive actions taken, for submission to the Project Proponent.
- Maintain a public complaints register in which all complaints are recorded, as well as action taken, for submission to the Applicant.

6.0 Applicable Legislation

The following legislation should be adhered to:

Title of legislation, policy or guideline:	Administering	Date:
	authority:	
Environment Conservation Act (73 of 1989)	DEA	1989
Mineral and Petroleum Act	DMR	2002
National Environmental Management Act (107 of 1998)	DEA	1998
National Heritage Resources Act 1999	SAHRA / AMAFA	1999
National Environmental Management: Biodiversity Act 2004	DEA	2004
National Forests Act 1998	DAFF	1998
National Water Act (Act 36 of 1998)	DWA	1998
National Water Resources Strategy 2004	DWA	2004
National Forests Act (84 of 1998)	DAFF	1998
Water Act 1956	DWA	1956
Occupational Health and Safety Act	Department of	1993
	Labour	
Hazardous Chemical Substance regulations	Department of	1995
	Labour	
Environmental Regulations for Workplaces	Department of	1987
	Labour	
General Administrative Regulations	Department of	2003
	Labour	
Construction Regulations	Department of	2003
	Labour	
National Standards (SANS)	SABS	2003
Noise Induced Hearing Loss Regulations	Department of	2003
	Labour	

7.0 Compliance and Performance Assessment

This EMPr must be updated with the conditions of the Environmental Authorisation (EA). A copy of the EMPr must be available on site at all times. An independent ECO must be appointed to monitor construction activities. At minimum, the ECO must submit monthly audit reports to the relevant competent authority for review unless otherwise requested by the Department. The contractor must monitor for non-compliance on a daily basis.

8.0 Summary of Impacts

The impacts below have been listed for the preferred alternative and all mitigation measures must be adhered to where appropriate:

Potential Impact	Mitigation Measure
Potential impact on the flow of the watercourse	 No construction activities are allowed to take place within 32m of the watercourse. A 35m buffer from the edge of the watercourse must be implemented. Towers must not be placed within 32m of the watercourse. Stringing of lines over the watercourse must be done with the use of a helicopter or special arrangements must be made. Existing access roads must be used during the construction and operational phases. Construction camps must be located further than 50m from the watercourse. All workers must be inducted on the protection of watercourses. This must be further managed with the use of the Environmental Management Programme.
Potential impact on river morphology due to erosion / damage to habitat	 No construction activities are allowed to take place within 32m of the watercourse. A 35m buffer from the edge of the watercourse must be implemented. Towers must not be placed within 32m of the watercourse. Stringing of lines over the watercourse must be done with the use of a helicopter or special arrangements must be made. Existing access roads must be used during the construction and operational phases. Construction camps must be located further than 50m from the watercourse. This must be further managed with the use of the Environmental Management Programme.
Potential impact on water quality due to sedimentation or poor construction practises	Implement suitable stormwater measures during construction to manage ingress of

	runoff into watercourses.
	Silt traps to be implemented if required.
	Ensure proper storage of material (including)
	fuel, paint) that could cause water pollution.
	Ensure proper storage and careful handling
	of hazardous substances with spill prevention
	materials at hand.
	Ensure proper waste management and
	housekeeping.
Erosion of stockpiled material	· · ·
Elosion of stockpiled material	Material must be stocked in such a way that it
	cannot fall or cause injury or damage to
	properties or the natural environment.
	Stockpiles must not exceed 2m in height and
	must be covered if exposed to heavy wind or
	rain.
	Alternatively, low walls or berms must be
	constructed around the stockpiles.
	No material is allowed to be stockpiled within
	35m of any watercourse.
	An Environmental Management Programme
	(EMPr) has been designed to manage
	construction activities and is included in
	Appendix G.
Erosion of steep areas / access roads	No cutting and filling in areas of 4%
	sideslope and less.
	Stabilisation of cleared areas to prevent and
	control erosion. The method chosen (e.g.
	watering, planting, retaining structures,
	commercial anti-erosion compounds) will be
	selected according to the site specific
	conditions.
	Drainage management should also be
	implemented to ensure the minimisation of
	potential erosion on access roads.
	Acceptable reinstatement and rehabilitation
	to prevent erosion during operation phase.
	A detailed geotechnical assessment may
	need be undertaken for each tower site prior
	to commencement of construction activities.

Contamination of soil due to concrete mixing	Cement mixing must take on a hard surface
	or cement mixing trays. Construction must
	be monitored by an ECO who will manage
	compliance with the construction EMPr.
Vegetation loss due to construction activities	 Only vegetation directly affected by the construction of the foundation of the tower site may be removed. Topsoil disturbance must be minimised as far as possible. Erosion control measures must be implemented as required. No protected vegetation was identified on site, however it is recommended that a site survey be undertaken prior to commencement of construction activities by the ECO and Engineer, if identified the plant or tree may not be removed without the
	relevant permit.
Damage to plant life outside of the proposed	Any plant accidentally removed outside the
distribution line routes	proposed routes should be replaced or
	rehabilitated at the expense of the contractor.
	Measures must be taken to penalize
	construction workers who damage plants
	intentionally or remove plants accidentally
	without reporting the incident.
The deviation of the power line may affect	The encroachment of alien vegetation must
biodiversity through the encroachment of exotic	be monitored regularly and controlled;
vegetation following soil disturbance, in addition	The area must be kept clear of all invader
the maintenance of the area would disturb	plants as per the Conservation of Agricultural
naturalized species within the area.	Resources Act, 1983 (Act No 43 of 1983).
	Rehabilitation measures must be employed
	until such a time as indigenous species are
	established. If herbicides are used then
	correct licenses and permits must be
District to the second	acquired prior to use.
Disturbance to fauna and avifauna	During site preparation special care must be
	taken during the clearing of the works area to
	minimize damage or disturbance of any
	roosting and nesting sites.

	Barricading measures to be utilised should not restrict the movement of the fauna in the area.
	 If any livestock is found on site, it must be carefully relocated outside the construction servitude.
	If required, bird flappers are to be used to avoid collision risks with the deviated lines.
Bird streamers causing electrical faults	Perch management through the use of perch deterrents (bird guards) can be used and fitted at least 1m directly above and on both sides of the phase conductor. Open perch areas should be allowed to remain after construction.
Collision of birds with lines	People responsible for maintaining the area should monitor for collisions and report any
	 incidents. Eskom employees and or subcontractors to remain inside construction footprint. All staff to be informed of disciplinary actions for the wilful damage to plants and animals. Fitting bird flappers on the lines within migratory pathways and the major migratory routes pertaining to the project area to coincide with sensitive areas such as river valleys and prominent ridge systems. Maintenance crews to monitor for bird collisions and to mitigate for this impact within areas identified as hotspot collision areas not previously identified during the preconstruction and construction and phase.
Loss of indigenous vegetation within the Savanna Biome	The deviation will result in the loss of vegetation which will contribute to the degradation and loss of indigenous within the savannah biome. It is however important to note that as part of the mining permit, this site will be rehabilitated to an eco tourist conservancy area.
Damage of heritage resources	Should remains and/or artefacts be discovered on the site during earthworks, all

	work will cease in the area affected and the Contractor will immediately inform the Construction Manager. • Should any heritage resources be exposed during excavation or be found on site, a registered heritage specialist must be called to site for inspection. • Should any heritage resources be exposed
	during excavation or be found on site, the relevant heritage resource agency (i.e. AMAFA) must be informed about the finding. • Under no circumstances may any heritage
	material be destroyed or removed from site.
	 If any heritage structures cannot be avoided the relevant permit must be obtained from the relevant authority to remove the structures. Should any remains be found on site that is potentially human remains, the South African Police Service should also be contacted.
Reduction in visual quality due to construction	Suitable screening of works area.
activities, poor housekeeping	 Construction camps to be situated in areas with reduced impact to surrounding community members. On-going housekeeping to maintain a tidy construction area. Proper reinstatement and rehabilitation of construction area must be undertaken.
Reduction in visual quality due to tower structures and lines	Trees should be used to screen the towers where possible, however there is an existing line in place and the project is to merely relocate the line within the same property.
Potential employment for local skilled workers,	Positive impact, no mitigation measure required
Deviation will also allow for mining to continue	
therefore contributing to the local economy. Temporary disruption to traffic during construction	• Evicting roads will be used and must be
remporary disruption to trainic during construction	 Existing roads will be used and must be rehabilitated if damaged in any way. Flagsman should be used to control traffic. Speed limits must be implemented and maintained.

Emission and dust generated during the construction phase

The increase in emissions will contribute to the existing emissions released by the mining activities, however the following mitigation must still be implemented to reduce emissions.

Vehicles that are not in good working order must be removed from site. Emissions generated from construction vehicles will be minimal and is not expected to significantly affect surrounding residents or hotel patrons. A water truck should be used to wet bare ground.

Increase in emissions and dust in the area

The increase in emissions will contribute to the existing emissions released by the mining activities, however the following mitigation must still be implemented to reduce emissions.

Vehicles that are not in good working order must be removed from site. Emissions generated from construction vehicles will be minimal and is not expected to significantly affect surrounding residents or hotel patrons. A water truck should be used to wet bare ground.

Noise generated by construction workers, machinery and construction vehicles disturbing surrounding residents, and business.

Excessive noise must be controlled on site. Workers will be trained regarding noise on site and construction hours will be kept to working hours (07h00 to 17h00). The construction will need to be monitored by an ECO who will ensure compliance with the construction EMPr. All precautions must be taken to ensure that noise generation is kept to a minimum. If excessive noise is expected during certain stages of the construction, residents must be notified prior to the event. An Environmental Management Programme (EMPr) has been designed to manage construction activities.

The improper storage and disposal of general and hazardous waste i.e. used oils from vehicles, old cement bags etc. resulting in possible contamination of the surrounding environment.

Hazardous waste: Hazardous waste must be stored on a hard surface within a bunded area and must not be allowed to enter storm water drains and the surrounding environment. Waste

must be disposed of regularly by a reputable contractor to a n approved landfill site. Hazardous waste such as oils, contaminated rags etc. must be disposed of at a hazardous class landfill. Safe disposal certificates must be obtained and kept on site at all times.

General Waste: Waste must be stored in the bins within the waste collection area in the Construction Camp and must not be allowed to blow around the site, be accessible by animals, or be placed in piles adjacent the skips / bins. Separate waste bins for each of the waste streams generated must be provided. The waste containers must be appropriate to the waste type contained therein and where necessary should be lined and covered. Waste must not be allowed to accumulate on site but should be disposed of regularly by a reputable contractor and must be disposed of at an appropriate landfill site.

Steel and Rubble: All excess material and rubble must be removed from the site so not to restrict the rehabilitation process. All excess material and rubble must go to an approved, designated landfill and a safe disposal certificate must be obtained.

Potential for construction waste to be disposed of at incorrect landfill resulting in contamination at the landfill site. Recycling should be undertaken where possible to limit waste added to the Landfill site. Waste to be sent to registered landfills and safe disposal certificates must be retained for hazardous waste.

Increase in waste sent to landfill site

Waste streams must be separated and recycled where possible to limit the amount of waste being added to the landfill site. Where possible, materials suitable enough to be used as fill material, should be used as fill to further reduce waste being sent to the landfill site.

Waste produced during the decommissioning / closure phase incorrectly disposed off

It is not anticipated that the deviated line will be decommissioned, however should this occur, the steel for the towers and the lines must be

	removed and recycled where possible. If this is not possible, the waste must be sent to a registered landfill site. The concrete used for the foundations are to be removed and the site to must be rehabilitated with indigenous vegetation.
Potential health issues related to the electric and magnetic field	Potential impacts are anticipated to be minimal based on previous studies undertaken by Eskom however the tower sites must be adequately fenced and danger and warning signs must be appropriately utilised.
Potential impact on construction activities due to blasting or other mining activities	The mine manager must be notified of the commencement of construction activities. All construction workers must undergo the mining induction and must be made aware of any potential activities that may affect the workers or construction activities.

9.0 EMPr / Management of Environmental Impacts

The framework for the management measures consists of the following:

- Objectives i.e. desired outcome of management measures for mitigating negative impacts and enhancing the positive impacts related to project activities and aspects (i.e. risk sources);
- Targets i.e. level of performance to accomplish management objectives; and
- Actions i.e. practical actions required to achieve management objectives and targets.

The Contractor shall supply method statements for all works required as stated throughout this document as per specific contract requirement. The ECO shall ensure that all works are in accordance with Method Statements and Contract Specifications.

The list of method statements required to assist in the implementation of this EMP includes but is not limited to the following (where applicable):

- Method Statement that outlines the approximate number of people on site, the layout of the camp, management of ablution facilities, noise and wastewater management;
- · Method Statement for the management of waste;
- Method Statement for the management of wetland and other sensitive areas;
- Method Statement to deal with traffic;
- Method Statement to deal with possible emergencies that can occur, such as fire; accidental leaks and spillage of fuels and oils;
- Method Statement for the storage of hazardous substances;
- Method Statement for management of concrete and batching plants; and

Method Statement for rehabilitation of construction footprint.

All conditions of the EMPr below must be implemented by the responsible person as discussed in section 5 of the EMPr.

9.1 Site Clearing

Phase	Objective	Action / Mitigation	Responsibility	Monitoring
		Measure		
Pre-Construction	Ensure that only areas required for construction activities are clearly demarcated.	 All sensitive areas must be clearly demarcated. The relevant permits must be obtained where necessary i.e. A DAFF permit for the removal of indigenous and or protected vegetation. All contractors to be made aware of the areas that within the construction footprint that must be cleared to allow for construction activities. A site plan must be prepared indicating areas to be cleared. Ensure that the relevant landowners are aware of the designated areas to be cleared. 	C/E	EO / ECO
Construction	• Ensure that only areas	Site plan demarcating areas to	C/E	EO / ECO

	required for construction activities are cleared.	be cleared must be used and monitored against. • Should any vegetation or structure or infrastructure be removed outside the designated areas, then contractor must notify the relevant person on site i.e. the PM, and the site must be rehabilitated if required and the structures replaced.		
Post Construction	Ensure that any cleared area that is not part of the built environment is rehabilitated where required.	Any area cleared for construction activities must be rehabilitated, and structures and infrastructures must be replaced if these areas do not form part of the newly built environment.	C/E	EO / ECO
Operation	N/A	N/A	N/A	N/A

9.2 Access Routes

Phase	Objective	Action / Mitigation Measure	Responsibility	Monitoring
Pre-	Ensure that all	Prepare a detailed site	C/E	EO / ECO
Construction	access routes	plan indicating the		
	are clearly	access routes to be		
	identified and	used.		
	demarcated.	The routes chosen must be located away from any sensitive		

		areas.		
		 All contractors and suppliers must be made aware of these routes. The relevant speed limits and signage must be implemented. 		
Construction	 Ensure that all construction vehicles use only dedicated access routes. Ensure proper access control. Adhere to agreements made with land users regarding access. 	 Site plan to detail all access road(s). Access roads shall be capable of accommodating the type of vehicles and/or mechanical plant using the routes. Any changes to the routes shown on the site plan need to be approved by the PM and ECO. Speed limits and signage must be maintained. The movement of any vehicles and/or personnel outside of designated working areas will not be permitted. Access roads to be maintained in a suitable condition. Suitable erosion protective measures to be implemented for access roads during 	C/E	EO / ECO

Damage to the existing access roads as a result of construction activities will be repaired to the satisfaction of the PM and ECO. Traffic safety measures (e.g. traffic warning signs, flagmen) to be implemented.
Post-Construction • Ensure that existing access roads used for construction purposes are rehabilitated / repaired where necessary; • Ensure that any roads constructed for access during the construction phase to be removed and the area rehabilitated. • All traffic signage used for construction activities must be removed. • Any damage to existing roads must be repaired. • Any damage to existing roads must be repaired.
Operational N/A N/A

9.3 Site Layout and Construction and Camp

Phase	Objective	Action / Mitigation Measure Responsibility Monitoring
Pre-	Planning and	Identify any sensitive C/E EO / ECO
Construction	layout of site to	environmental features

ensure protection of receiving environment.

- i.e. wetland areas, where special care needs to be taken and implement suitable mitigation measures to protect these features.
- Site layout to be approved by PM and ECO.
- Location of construction camp to avoid sensitive environmental features.
- The contractor must supply a site plan for the construction camp to the ECO and PM for approval.
- Structures within the site camp must be located to reduce visual intrusion and minimal disturbance to the biophysical environment.
- Documentation for each proposed camp site should be prepared by the contractor prior to the of commencement construction activities, and submitted to the PM and Environmental Advisor for approval. This documentation should include, but not limited to the following:
 - Site layout including access points and material storage areas;
 - Topsoil and subsoil management;

		o Infill areas;	
		Waste water	
		facilities;	
		o Erosion control;	
		o Fencing;	
		o General and	
		Hazardous waste	
		management;	
		o Workshop /	
		Maintenance areas;	
		o Management of	
		hazardous materials,	
		o Water supply; and	
		o Rehabilitation.	
Construction	Maintenance of	The designated waste	EO / ECO
	construction	area must be utilized	
	camp to minimise	at all times.	
	environmental	Tailet facilities mount	
	associated with	Toilet facilities must	
	the site camp	be provided for construction staff.	
		Should chemical	
		toilets be used on site,	
		these must be	
		maintained regularly.	
		mamamou regularry.	
		Storm water control	
		must be maintained	
		and flow must be	
		directed into existing	
		drainage ditches.	
		 A stormwater 	
		management plan	
		must be implemented.	
		act 20plomortou.	
		Litter collection bins	
		must be provided and	
		emptied at regular	
		intervals.	

9.4 Education - Environmental Awareness

Phase	Objective	Action / Mitigation Measure	Responsibility	Monitoring
Pre-Construction	Ensure that all staff are aware of potential impacts and mitigations measures, as well ways in which to protect the environment.	 Environmental Awareness training must be undertaken for staff at all levels. All staff must be familiar with the EMPr and conditions of the EA issued by the Department of Agriculture and Environmental Affairs (DAEA). Workers must be shown areas with sensitive features and must be informed of the importance of ensuring this area is not impacted on. Site workers must be trained in avoiding impacts in areas of potential concern (e.g. the buffered areas) 	C /E	EO / ECO
Construction		 Daily / Weekly toolbox talks must be held with all contractors and subcontractors to ensure that they are aware of the environmental and safety and health issues. Topics should address but not limited to the following: 	•	•

		0	Waste management;		
		0	Access roads;		
		0	Sensitive areas;		
		0	PPE;		
		0	Use of drip trays;		
		0	Storage of hazardous substances;		
		0	Emergency procedures; etc.		
Post Construction	N/A	N/A		N/A	N/A
Operation	N/A	N/A		N/A	N/A

9.5 Storage Areas

Phase	Objective	Action / Mitigation Measure	Responsibility	Monitoring
Pre- Construction	Establish suitable storage areas for general and hazardous materials with minimal impact on the surrounding environment	 Storage areas must be clearly indicated on the site plan. Storage areas must be located outside sensitive areas and further then 20m from any buffered wetland areas. 	C/E	EO / ECO
Construction	Ensure that storage areas and the associated handling of non-hazardous materials do not result in any pollution or contamination of the surrounding	Materials must be suitably stored to prevent environmental contamination and visual impacts. Storage requirements to be determined based on chemical qualities of material.	C/E	EO / ECO

Operation	N/A	N/A	N/A	N/A
Post Construction	Ensure that the storage areas are removed and the site rehabilitated if it is not located within the newly built environment.	 The contractor must ensure that there are no remaining materials or substances are stored on site once all construction activities are complete. Any remaining material must either be sent back to the supplier or to another construction site if possible. 	C/E	EO / ECO
	environment.	 Where required, stored material to be protected from rain and run-off to avoid environmental contamination. Materials must be appropriately transported to avoid environmental contamination. Loose loads (e.g. refuse, paper and cement) must be covered. Suitable remedial measures, depending on the nature of the contaminant and the receiving environment, to be instituted for spillages. Materials to be suitably used to prevent environmental contamination. 		

9.6 Storage and Handling of Hazardous Materials and Substances

Phase	Objective	Action / Mitigation Measure	Responsibility	Monitoring

Construction	Ensure that the	•	Hazardous materials	C/E	EO / EC
	storage and		must be suitably stored to		
	handling of		prevent environmental		
	hazardous		contamination and visual		
	materials does not		impacts. Storage		
	result in		requirements to be		
	contamination /		determined based on		
	pollution of the		chemical qualities of		
	surrounding		material.		
	environment.	•	Hazardous materials		
			must be stored in a		
			bunded, lockable, roofed		
			area.		
		•	Drip trays must be used		
			for hazardous substances		
			/ materials that are used		
			on the construction site.		
		•	The MSDS kept at the		
			storage area must be		
			maintained and amended		
			as new substances are		
			stored.		
		•	Where required, stored		
			material to be protected		
			from rain and run-off to		
			avoid environmental		
			contamination.		
		•	Materials must be		
			appropriately transported		
			to avoid environmental		
			contamination. Loose		
			loads (e.g. refuse, paper		
			and cement) must be		
			covered.		
		•	Suitable remedial		
			measures, depending on		
			the nature of the		
			contaminant and the		
			receiving environment, to		
			<u> </u>		

be instituted for spillages.

- Materials to be suitably used to prevent environmental contamination.
- Staff must be trained to work with hazardous substances / materials.
- Should a spillage of hazardous substances occur, the appropriate clean up and disposal measures must be implemented. The contractor must compile a method statement for this purpose.
- The following will apply should a spillage occur:
 - All contaminated soil must be removed and be placed in containers;
 - Contaminated
 material can be
 either bio remediated or
 disposed off at a
 suitable
 hazardous site;
 - Smaller spills can be treated on site, and identified employees must be trained to perform this function;
 - o A specialist

		Contractor shall	
		be used for the	
		bio-remediation of	
		contaminated soil	
		where the required	
		remediation	
		material is not	
		available on site;	
		and	
		o All spills of	
		hazardous	
		substances must	
		be recorded and	
		reported	
		immediately to the	
		EO and PM for	
		further remedial	
		action that may	
		require engaging	
		with relevant	
		authorities (<i>e.g.</i>	
		the Department of	
		Water Affairs in	
		cases where there	
		is water pollution).	
Post	Ensure that all	The contractor must	
Construction	hazardous	ensure that there are no	
	substances used	remaining hazardous	
	during the	materials or substances	
	construction	are stored on site once all	
	phase is removed	construction activities are	
	from the site and	complete.	
	that no harm or		
	pollution of the	Any remaining material	
	environment	must either be sent back	
	occurs.	to the supplier or to	
		another construction site	
		if possible	
Operation	Ensure that the	The applicant is Applicant	EO / SHEQ Officer
Эрогипоп	Libaro triat tric	The applicant is Applicant	

9.7 Materials - Management and Sourcing

Phase	Objective	Action / Mitigation	Responsibility	Monitoring
		Measure		
Pre-	Ensure that	Contractor must	C/E	EO / ECO
Construction	materials are	ensure that all		
	obtained from	materials brought on		
	license facilities	site are		
		accommodated by		
		the relevant slips		
		from a licensed		
		supplier.		
		It is the responsibility		
		of the contractor to		
		obtain materials from		
		legal sources.		
Construction	Ensure that	All materials must be	C/E	EO / ECO
	materials obtained	obtained from		
	do not result in any	licensed suppliers.		
	negative impact to	 No sand mining or 		
	the environment	borrow pit activities		
	either directly or	are allowed without		
	indirectly.	first obtaining the		
		relevant permits from		
		the DMR.		
		It is anticipated that		
		water will be obtained		

		from the municipal system, however should extraction of water be required this must not exceed the relevant DWA thresholds. It is the responsibility of the contractor to ensure that all the relevant permits are in place. The contractor must ensure that only the required amount of material is obtained, the wastage of material must be minimised.		
Post Construction	Ensure that areas where materials were sourced from are rehabilitated to ensure no erosion or degradation of the surrounding environment occurs.	Should materials be sourced either through sand mining / borrow pits etc., a rehabilitation plan must be implemented and effected.	C/E	EO/ECO
Operation	N/A	N/A	N/A	N/A

9.8 Construction Vehicles / Equipment Maintenance

Phase	Objective	Action / Mitigation	Responsibility	Monitoring
		Measure		
Pre-	Ensure that the	All vehicles or	C/E	EO / ECO
Construction	vehicles or	equipment must be		
	equipment to be	checked before being		
	used on site do not	brought onto site.		
	cause harm to the	A method statement		
	environment and	must be prepared for		
	are in safe working	vehicle and		

	conditions.		maintenance.		
Construction	Ensure that the	•	Maintenance of	C/E	EO / ECO
	construction		equipment and		
	vehicles /		vehicles will be		
	equipment used on		performed in such a		
	site does not result		manner so as to		
	on contamination or		avoid any		
	pollution of the		environmental		
	surrounding		contamination (e.g.		
	environment.		use of drip trays) and		
			must only occur		
			within the site where		
			possible.		
		•	The washing of		
			vehicles on site is not		
			allowed.		
		•	Drip trays must be		
			provided for the		
			equipment that could		
			leak oil, stationary		
			plant and for the		
			"parked" plant.		
		•	All vehicles and		
			equipment will be		
			kept in good working		
			order and serviced		
			regularly. Leaking		
			equipment must be		
			repaired immediately		
			or removed from the		
			site.		
		•	Suitable storage and		
			disposal of hydraulic		
			fluids and other		
			vehicle oils.		
		•	Any vehicle or		
			equipment not in use		
			must be stored within		
			a designated		
		•	equipment not in use must be stored within		

Post	Ensure that all	• All vehicles /	C/E	EO/ECO
Construction	vehicles /	equipment must be		
	equipment are	removed from the		
	removed from site	construction site.		
Operation	N/A	N/A	N/A	N/A

9.9 Air Quality and Dust Control

Phase	Objective	Action / Mitigation	Responsibility	Monitoring
		Measure		
Pre-Construction Construction	Prevent any negative air quality impacts. Ensure that the	The contractor must obtain the necessary equipment to ensure that dust is controlled during the construction phase. Appropriate dust	C/E	EO / ECO
Construction	potential impact on air quality is minimised.	 Appropriate dust suppression measures or temporary stabilising mechanisms must be used when dust generation is unavoidable (e.g. dampening with water). Dust suppression to be undertaken for all bare areas, if required. Speed limits must be strictly adhered to. The Contractor must take preventative measures to minimise complaints regarding dust nuisances (e.g. dust control, timing, prenotification of 	O.L.	

		affected parties).		
		A complaints register		
		must be maintained		
		on site at all times		
		and be made		
		accessible to the		
		surrounding		
		community (or any		
		affected person(s)) to		
		record complaints		
		regarding odours,		
		emissions and/or		
		excessive levels of		
		dust.		
		The construction		
		vehicles must be		
		regularly maintained		
		to ensure that		
		excessive emissions		
		are controlled.		
Post	N/A	N/A	N/A	N/A
Construction				
Operation	N/A	N/A	N/A	N/A

9.10 Waste Water and Ablution Facilities

Phase	Objective	Action / Mitigation Measure	Responsibility	Monitoring
Pre-Construction	Ensure that sufficient waste water collection facilities are available.	The contractor shall submit a method statement to the ECO detailing how wastewater would be collected from all wastewater generating areas, as well as storage and disposal methods. If the contractor intends to carry out any on-	C/E	EO / ECO

		site wastewater	
		treatment, this must	
		also be included.	
		No contaminated	
		runoff or gray (i.e.	
		water from washing	
		hands) water may be	
		discharged from the	
		site camp.	
		Temporary waste	
		water facilities must	
		be implemented for	
		the construction	
		phase where	
		necessary. It is	
		recommended that a	
		wash bay with sand	
		and grease traps be	
		temporarily installed	
		for the duration of	
		construction	
		activities.	
		The contractor can	
		utilize conservancy	
		tanks or connect to	
		the existing waste	
		water system.	
		The ECO's approval	
		must be obtained	
		prior to the discharge	
		of contaminated	
		water into sewer	
		systems.	
Construction	Ensure that the	The chemical toilets	
	waste water	servicing the camp	
	produced on site	must be maintained	
	does not result in	in a good state, and	
	any contamination	any spills or	
	of the surrounding	overflows must be	

immediately by a sanitation expert. 1 portable toilet must be provided for every 15 staff members. No waste water must be allowed to runoff into the surrounding buffered areas. Runoff from fuel depots / workshops / machinery washing areas and concrete batching areas must be directed into a conservancy tank or into the wash bay before being disposed off into the municipal waste water system. Should conservancy tanks be utilized, the waste collected must be disposed of at a site approved by the ECO.
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collected must be disposed of at a site approved by the ECO.
disposed of at a site approved by the ECO.
approved by the ECO.
ECO.
Grey water from
washing of
equipment etc. must
be directed to the
wash bay or collected
for safe disposal and
should not be
disposed of on site.
Alternatively no
vehicle equipment
washing should be

		conducted on site. Toilet waste to be removed by an approved contractor and safe disposal certificates must be kept on site and available on request.	
Post Construction	Ensure that the site is clean and that not waste water has contaminated the site.	 All waste water collection facilities must be removed. Ensure clean up and rehabilitation of areas where any waste water spillage has occurred. 	EO / ECO
Operation	Ensure that waste water does not result in contamination of the surrounding environment.	 Tenants must be connected to the municipal water-borne sewerage system. Tenants must be made aware of the re-use of grey water and other water conservation methods. 	ant SHEQ / EO

9.11 Solid Waste Management and Waste Disposal

Phase	Objective	Action / Mitigation Measure	Responsibility	Monitoring
Pre- Construction	Ensure that measure are put in place to collect waste and dispose of it appropriately.	 A method statement must be prepared for the waste management during the construction phase. The relevant waste bins and skips must 	C/E	EO / ECO

			be ordered before		
			construction		
			commences.		
		•	Toolbox talks must		
			be done prior to		
			construction and		
			during construction		
			so that workers are		
			aware of waste		
			management.		
Construction	Ensure that solid	•	No littering is allowed	C/E	EO / ECO
	waste does not		on construction site.		
	contaminate the	•	The site must be		
	surrounding		maintained in a clean		
	environment.		and tidy condition at		
			all times.		
		•	All waste produced		
			on site must be		
			disposed off at a		
			licensed facility and		
			all waste disposal		
			certificates must be		
			obtained and kept on		
			site.		
		•	Adequate waste		
			collection containers		
			must be provided.		
			Each waste bin must		
			be clearly marked.		
		•	Waste bins must be		
			removed weekly or		
			daily if required.		
		•	No dumping to occur		
			in the buffered area.		
		•	The construction		
			rubble must be		
			disposed at the		
			relevant landfill if it		
			cannot be re-used.		

- Refuse must be separated at source and disposed in the appropriate bins, which will be emptied regularly.
- Separation of waste and recycling of paper, glass etc must be encouraged throughout the construction period.
 Recycling bins must be utilized.
 Composting of organic waste is encouraged.
- ΑII solid waste generated during the construction process (including packets, plastic, rubble, cut plant material, waste metals etc) must be placed in the waste collection area in the construction camp and must not be allowed to blow around the site, be accessible by animals, or be placed in piles adjacent the skips / bins. Weather proof and vermin proof bins must be used at all times.
- Large skips must be covered with a

tarpaulin at all times or a lid. Separate waste bins for each of the waste generated streams must be provided. The waste containers must be appropriate to the waste type contained therein and where necessary should be lined and covered. Waste must not be allowed to accumulate on site should but be disposed of regularly by а reputable contractor. Hazardous waste such oils, as contaminated rags etc must be disposed of at a hazardous class landfill. Rubble must not be buried on site. separate drum must be available for storage of contaminated soil.

Post	•	All litter must be	
Construction		removed from the	
		site.	
	•	Burying of rubble on	
		site, or dumping in	
		drainage lines/rivers	
		is prohibited. A check	
		must be done by the	
		contractor before the	
		site is handed over to	
		the applicant. The	
		contractor is to check	
		that the stormwater	
		channels and the	
		drainage pipes are	
		free from building	
		rubble, spoil	
		materials and waste	
		materials.	
	•	Surfaces are to be	
		checked for waste	
		products from	
		activities such as	
		concreting or	
		asphalting and	
		cleared in a manner	
		approved by the	
		ECO.	
	•	DSW must be	
		notified by the	
		contractor prior to	
		operation to ensure	
		that once the new	
		development is	
		occupied, any refuse	
		produced will be	
		collected weekly by	
		DSW or the	
		appointed sub-	

		contractor.		
Operation	Ensure that solid waste does not contaminate the site.	DSW must be contacted to ensure that waste is collected form the development on a weekly basis.	Applicant	SHEQ /EO

9.12 Social Impacts

Phase	Objective	Action / Mitigation Measure	Responsibility	Monitoring
Pre- Construction	Ensure that the activities have minimal impact on the businesses and neighbours.	 All landowners and neighbours must be made aware of the commencement of construction activities. 	C/E	EO / ECO

		A		
	•	A complaints register		
		must be prepared		
		and neighbours /		
		landowners must be		
		made aware of the		
		process to lodge any		
		complaints or issues.		
	•	A traffic management		
		plan must be		
		implemented to		
		ensure that traffic		
		impacts have minimal		
		effect on users.		
Construction	•	Consult with property	C/E	EO / ECO
		owners, local		
		authorities and		
		communities to		
		ensure that all		
		affected parties are		
		•		
		informed of the timing		
		and extent of any		
		disruptions.		
	•	Comply with		
		agreements made		
		with landowners prior		
		to construction, which		
		includes matters		
		such as security,		
		access, etc.		
	•	The Contractor		
		should, in		
		consultation with		
		local HIV/AIDS		
		organisations and		
		government		
		structures, design		
		and implement a		
		STD, HIV and AIDS		
		awareness and		

Operation	N/A	N/A	N/A	N/A
Post Construction	Ensure that there are no outstanding social issues that have not been attended to during the construction phase.	Implement the relevant traffic plan. Ensure that all complaints noted were all attended to and that there are no outstanding issues from neighbours/ businesses near the site.	C/E	EO / ECO
		prevention campaign for employees. This campaign should use various common practice methodologies in order to ensure social and cultural sensitivity.		

9.13 Safety and Security

Phase	Objective	Action / Mitigation Measure	Responsibility	Monitoring
Pre-Construction	Ensure that the site is access controlled to prevent any unauthorised person from entering and resulting in any potential injuries.	 Access gates and fences to be erected. Only designated personal to be allowed onto site. A security guard to be placed at entrance of site to monitor who enters and leave the site. PPE must be brought on site for employees prior to commencement of site or activities. 	C/E	EO / ECO

		•	Signboards with		
			contact and		
			emergency numbers		
			must be placed at the		
			entrance to the site		
			and at appropriate		
			points.		
		•	A health and safety		
			plan must be		
			implemented.		
		•	A method Statement		
			must be prepared to		
			address this issue.		
Construction	Ensure that the site	•	Staff must wear	C/E	EO / ECO
	is secure and that		appropriate PPE at		
	staff adhere to		all times.		
	Health and Safety	•	Adherence of the		
	requirements.		Contractor and all		
	'		employees on site to		
			the Safety, Health		
			and Environment		
			Policy.		
			-		
		•	Emergency contact		
			details will be		
			prominently		
			displayed and		
			maintained during the		
			construction phase.		
		•	All workers will be		
			supplied with the		
			required Personal		
			Protective Equipment		
			as per the		
			Occupational Health		
			and Safety Act (Act		
			No. 85 of 1993). The		
			contractor must		
			ensure that staff wear		
			the PPE provided at		
	l .				

		all times.		
Post	Ensure that the site	The site must be left	C/E	EO / ECO
Construction	is safe once	in a safe condition		
	construction	and no machinery or		
	activities have been	any other equipment		
	completed.	or structures or		
		substances that		
		could result in injury		
		of any person must		
		left on site.		
Operation	N/A	N/A	N/A	N/A

9.14 Soil Erosion

Phase	Objective	Action / Mitigation	Responsibility	Monitoring
		Measure		
Pre-	Prevent any soil	The contractor shall,	C/E	EO / ECO
Construction	erosion within the	as an initial and		
	site and	ongoing exercise,		
	surrounding	implement erosion		
	environment.	and sedimentation		
		control measures to		
		the satisfaction of the		
		ECO.		
		• The developer /		
		contractor must		
		ensure that the		
		buffered areas are		
		clearly demarcated		
		and must ensure that		
		these areas are not		
		impacted on as a		
		result of erosion or		
		sedimentation.		
Construction	Protect surrounding	Stabilisation of	C/E	EO / ECO
	areas from soil	cleared areas to		
	erosion.	prevent and control		
		erosion and/or		
		sedimentation must		
		be actively managed.		

		•	The contractor must ensure that any areas susceptible to erosion is protected by installing necessary temporary and permanent drainage works as soon as possible and by taking any other measures necessary to prevent stormwater from concentrating in streams and scouring slopes, banks, etc. Traffic and movement over stabilised areas must be restricted and controlled to prevent erosion.		
Post Construction	Ensure that no erosion has occurred on site and to prevent any erosion from taking place.	•	Any eroded soil on paths / roadways / other areas must be collected and replaced in the area from which it was eroded. These high risk erosion areas must be protected from further soil erosion.		
Operation	Ensure protection of the surrounding environments and buffered areas.	•	The buffered area must be strictly maintained. This vegetation band will protect against erosion along the	Applicant	SHEQ Officer /EO

banks.
An operational plan
for maintenance of
the buffer must be
implemented and
followed. The plan
must include the
phased and
controlled removal of
alien vegetation and
the re-introduction of
indigenous
vegetation.

9.15 Conservation of the Natural Environment

Phase	Objective	Action / Mitigation	Responsibility	Monitoring
		Measure		
Pre-Construction	Ensure that sensitive areas are protected.	 All sensitive areas must be identified together with the ECO and clearly marked and demarcated. All recommended buffers as per the conditions of the BAR must be implemented. 	C/E	EO / ECO
Construction	Ensure protection of the sensitive environments.	 Sensitive areas must be clearly marked and buffered where required. Staff are not allowed in these areas. No construction activities are allowed in these areas. Waste must not be allowed to enter 	C/E	EO/ECO

Post Construction	Ensure that the sensitive environments are protected and that the construction activities have not resulted in any damage or disturbance to these environments.	•	these areas. Contaminated runoff must not be allowed to enter the sensitive areas. The contractor must ensure that the areas marked as sensitive areas have not been damaged or disturbed in any way.	C/E	EO/ECO
Operation	Ensure of protection of sensitive environments.	•	The sensitive areas must be demarcated during the operation phase and maintained by the applicant if it is located within their land. A maintenance plan must be prepared for the operation of the new development. Do dumping must be allowed in these areas.	Applicant	EO / SHEQ Officer

9.16 **Cultural Environment**

Phase	Objective	Action / Mitigation Measure	Responsibility	Monitoring
Pre- Construction	Ensure that no items of cultural	The site must be checked to ensure	C/E	EO / ECO
	significance are present on site.	that there are no areas of cultural or		

		heritage significance. This can be undertaken by the EO who must ensure that they are familiar with the task to be undertaken.		
Construction	Ensure that should any items of cultural or heritage significance be identified, that these items are protected.	Should any artefact or items of cultural significance be identified, all construction activities must stop and the relevant Engineer, EO, ECO and the relevant authority must be notified.	C/E	EO/ECO
Post Construction	N/A	N/A	N/A	N/A
Operation	N/A	N/A	N/A	N/A

9.17 Emergency Procedure

Phase	Objective	Action / Mitigation Measure	Responsibility	Monitoring
Pre-Construction	Ensure that all staff are aware of emergency procedures such that the environmental and health and safety impacts are minimised.	 All construction staff must be made aware of emergency phone numbers to use in the case of an emergency. All staff must be trained on how to react in the case of an emergency. An emergency response team must be set up to manage emergencies. 	C/E	EO / ECO

Construction

Minimise environmental impacts associated with the emergency procedures associated with fires / leaks / spillages.

- Any incident minor / major must immediately be noted on the incidents register and the appropriate process must be followed.
- Major incidents / spillages must be reported to the authorities relevant and the DEA incident emergency report must be completed and submitted.
- Contractor to develop proper emergency response for dealing with fires.
- Burning of waste is not permitted.
- Suitable precautions will be taken (e.g. suitable fire extinguishers, water bowsers, welding curtains) when working with welding or grinding equipment.
- All fire fighting equipment must be regularly inspected by a qualified person and where applicable be approved by local fire services.
- All staff on site will be

	made aware of
	general fire
	prevention and control
	methods, and the
	name of the
	responsible person to
	alert to the presence
	of a fire.
	Contractor to develop
	emergency response
	procedure for dealing
	with spills and leaks.
	Ensure that the
	necessary materials
	and equipment for
	dealing with spills and
	leaks are available on
	site, where
	practicable.
	Remediation of the
	spill areas will be
	undertaken to the
	satisfaction of the PM
	and Environmental
	Advisor.
	In the event of a
	hydrocarbon spill, the
	source of the spillage
	will be isolated and
	contained. The
	hazardous waste will
	be treated in
	accordance with the
	waste management
	requirements, which
	includes suitable
	disposal or treatment.
Post N/A	N/A
Construction	

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9.18 **Decommissioning**

- contaminate the buffered area or sensitive areas.
- Any wash water must be treated as contaminated and is not permitted to enter stormwater drains and runoff into the receiving environment.
- Rehabilitation measures must be put into place.
- All structures, foundations, concrete and tarred areas are demolished. Rubble must be removed by an approved contractor and taken to a licensed landfill site. Waste recycling must be encouraged.
- A long-term monitoring system must be in place to ensure total rehabilitation of the site following decommissioning.
- An assessment of the end land use to determine which infrastructure will be removed or retained must be undertaken.
- Equipment, structures, and building material that can be reused will be identified prior to the commencement of rehabilitation activities.
- Scrap metal and equipment will be sold as scrap or disposed of at a suitably licensed facility.