DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

FOR

DEVELOPMENT OF A NEW SOLID WASTE SITE IN LUCKHOFF

FREE STATE DESTEA REF. NO:.WML/EIA/02/2018

SUBMITTED TO

DEPARTMENT OF ECONOMIC, SMALL BUSINESS DEVELOPMENT, TOURISM AND ENVIRONMENTAL AFFAIRS

ON BEHALF OF

LETSEMENG LOCAL MUNICIPALITY

PREPARED BY

NSVT CONSULTANTS

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1. INTRODUCTION

Letsemeng Local Municipality has appointed *NSVT Consultants* as independent environmental assessment practitioners to undertake an Environmental Impact Assessment as well as the Waste License application process and subsequently to complete the draft Environmental Management Program (EMPR) for the construction of a waste facility in Luckhoff in the Free-State. An EMPR is management tool to manage and mitigate the negative impacts associated with the proposed waste site and to promote environmental sustainability. The EMPR was carried out in terms of (EIA) Environmental Impact Assessment Regulations of 2014, as amended on the 7th April 2017 of National Environmental Management (NEMA) Act (Act 107 of 1998). Section 28 "duty care" of NEMA bestows the responsibility on the polluter to ensure that reasonable measures are put in place to prevent pollution or degradation of the environment to occur, continue or recurred and the plan must be in line with NEMA (Act 107 of 1998).

2. DETAILS OF ENVIRONMENTAL ASSESSMENT PRACTITIONER

The curriculum vitae of the EAP is attached hereto as **Appendix A**.

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QUALIFICATIONS	B. Sc (Natural Science) B. Sc Hons (Wildlife)	**EXPERIENCE**	16 years working in the environmental management field as an EAP. She has completed environmental impact assessment, basic assessment, drafting of EMPRs and environmental compliance monitoring for various development within the Free State., North West, Northern Cape and Eastern Cape Provinces.
TRAINING	Resources & Sustainability, Physical & Biological Environment and Informatics, 2006 Project Management for Environmental Management, 2006 Social & Economic Sustainability, 2006 Use of Matrices in EIA, 2008 Public Participation Training, 2010 Introduction to Social Impact Assessment, 2011 Integrating HIV/Aids and Gender-related issues into EIA Process, 2013 Integrated Water Resources Management, Water Use Authorisation and Water Use License Application, 2013 One Environmental System-2015 Introduction to Environmental Law-2018	**PROFESSIONAL AFFILIATE**	SACNASP Professional Natural Scientist-4000161/09 Member of International Association for Public Participation Southern Africa Affiliate-2010/ZA/FS/0001) Member of International Association for Impact Assessment SA-2191

3. PROJECT DESCRIPTION

3.1. BACKGROUND INFORMATION

The proposed solid waste facility is located in Luckhoff, 48km from Koffiefontein which falls under the Letsemeng Local Municipality, Xhariep District Municipality in the Free State Province. The proposed site is 17.7 hectares and situated in the Remaining Extent of Farm Dorpsgronden van Luckhoff 577. The proposed site is accessible via Rabie Street followed by a dirt road and it's located roughly 1.1 km from the urban areas. The waste site will close the gap in the community of Luckhoff for disposal of general and domestic waste. The solid waste facility will be used by Maluti-a-Phofung Local Municipality to service the Luckhoff area and surrounding farms.

Specialist studies were to be conducted prior to any construction of the proposed solid waste facility in order to determine the most environmentally acceptable development footprint. The following specialist studies were conducted:

- Archaeological Assessment;
- Palaeontological Assessment;
- Ecological Assessment and Wetland Delineation; and
- Geotechnical Investigation

The solid waste facility will comprise of the following components:

1. One cell;
2. Security guardhouse;
3. Waste recycling facility;
4. Stormwater pond;
5. Leachate pond;
6. General waste dump area;
7. Rubble dump area;
8. Cover Material Stockpile Area; and
9. 1.8m perimeter fence with a lockable gate.

The condition of the existing gravel road, which branches off from Rabie Street will be improved as part of the construction phase and the water and sewer will be connected to the municipal connections. A culvert will be placed at the crossing of the seasonal drainage line to ensure that the flow is not impeded or obstructed.

3.2. PROJECT LOCATION

The proposed development is located in the Remaining Extent of Farm Dorpsgronden van Luckhoff 577, which is to the east of Luckhoff area and it is a municipal-owned property. Based on the proposed site, the construction and operation of the proposed development will not hinder any traffic flow as it is located away from the urban or residential area. It is used for grazing purposes although it's not recognized as a formal grazing area.

The co-ordinates of the external boundary for the proposed solid waste site is shown in *Table 1* below.

Table 1: Four (4) External Boundary Co-ordinates of the Proposed Site

POINT	LATITUDE			LONGITUDE		
	DD	MM	SS	DD	MM	SS
A	S29˚	44’	56.27”	E24	47’	44.38”
B	S29˚	44’	53.65”	E24˚	48’	3.41”
C	S29˚	44’	58.43”	E24˚	48’	7.51”
D	S29˚	45’	10.60”	E24˚	47’	49.26”

4. CHECKLIST FOR THE PROPOSED DEVELOPMENT

1. **Give a brief description of the surrounding area:**

   The surrounding area encompasses mainly land used for agriculture which is undeveloped, Eskom Powerlines and substation, quarry, grass and shrubs. The nearest residential area can be observed to the west of the proposed site.

2. **Is the project significantly different from the surrounding land use?**

   Yes, the nearest landfill site is in town.

3. **Are any of the following located on the site chosen for the development?**

   i. River, stream, dam, wetland – No, the watercourses (earth-dams, seasonal drainage line and stream) are 200m away.

   ii. Open space area – No

   iii. Residential (formal or informal settlement) – No

   iv. Area of cultural or archaeological importance, e.g. graveyards, old houses, museum, etc. – Yes, stone tool knapping are scattered on the site.

4. **Will the project be considered a noisy intrusion to the neighbors?**

   No, the increased noise levels will be during construction and thereafter, the waste facility is outside the residential area.

5. **Would it be necessary to construct roads to access the proposed site?**

   No, there are existing access roads to the proposed site.

5. SENSITIVITY OF THE PROPOSED SITE

From the specialists’ studies undertaken the findings are summarised as follows:

- The site is located on the Northern Upper Karoo vegetation type, classified as Least Threatened.
- No Red Data Listed, National protected or any other species of conservational significance were found.
- No important Bird Areas
- There are no groundwater users within 400m radius of the proposed site and no groundwater encountered during the Geotechnical Investigation.
- No wetlands within the proposed site.
- The site is underlain by dolerite.
- There are scattered stone tool knapping on site.
- The site has no fossiliferous outcrops thus the low palaeontological sensitivity.
- Rocky ridge transverses the site has unique habitat features.

The identified sensitive features on the proposed site are protected Aloe species, provincially protected small shrub species and a rocky ridge, which transverse the site has unique habitat features but not conservationally significant. The sensitivity map compiled by the Ecologist and Wetland Delineation Specialist is shown in **Appendix B**.

6. ENVIRONMENTAL MANAGEMENT PROGRAMME

6.1. INTRODUCTION

The EMPr has been divided into four different phases associated with the proposed development namely the pre-construction planning phase, the construction phase and operational phase. This draft EMPR will be considered a Final EMPr if approved by the Department of Economic, Small Business Development, Tourism and Environmental Affairs (DESTEA). It should be read in conjunction with the contract documentation to ensure that Letsemeng Local Municipality works in an environmentally sensitive manner, thus ensuring the impacts on the environment and neighbouring agricultural properties are kept to a minimum.

6.2. OBJECTIVES OF THE EMPR

The aim of the EMPr is to ensure that impact on the environment due to the proposed development is limited. To achieve this, the EMPr has the following objectives:

- To identify possible environmental impacts of the proposed activity on the environment and mitigation thereof.
- To provide information on construction activities associated with the identified environmental issues.
- To provide guidelines for the Letsemeng Local Municipality in respect to the identified environmental issues.
- To provide guidelines to the responsible persons from Letsemeng Local Municipality to follow appropriate contingency plans in the case of various negative impacts.

6.3. RESPONSIBLE PERSON (S)

The implementation of this EMPr requires the involvement of various role players, each with specific responsibilities to ensure that the development is completed in an environmentally sensitive manner.

The Developer: Letsemeng Local Municipality

Responsibility: To implement the final EMPr after approval by DESTEA before the commencement of the construction phase and ensure the proposed development complies with the NEMA requirements and the Environmental Authorisation.

Consulting Engineers: Dipabala Consulting Engineers

Responsibility: To undertake the detailed design for the proposed development and to ensure that necessary permits have been obtained prior to construction.

Environmental Control Officer:

Responsibility:

- To ensure that the Letsemeng Local Municipality implements the EMPr for the duration of the project from pre-construction to post-construction (decommissioning).
- To review the method statements compiled by the contractor with the resident engineer.
- To maintain a direct open line between the Letsemeng Local Municipality team and the community.
- To audit the implementation of the EMPr and compliance to the environmental authorisation once a month until project completion.

The Contractor:

Responsibility:

- To implement the EMPr and keep a copy on-site for the duration of the construction phase, as the obligations imposed by the document are legally binding.
- To comply with the Waste Management License conditions and undertake construction activities in an environmentally sensitive manner and rehabilitation of the proposed site.
- To undertake good housekeeping practices during the duration of the project.
- To ensure that adequate environmental awareness training takes place in the language of the Employees.

Designated Environmental Officer:

Responsibility:

- To implement the environmental management plan.
- To maintain records of environmental queries for the duration of the construction.
- To resolve environmental issues during the construction phase of the project.

The Project Steering Committee (Environmental Forum): A committee that comprises of representatives of Letsemeng Local Municipality, Engineers, ECO; Councillor and Ward Committees.

Responsibility:

- To monitor the implementation of the EMPr.
- To assist in the sourcing of general workers from the local community and surrounding farms.
- To help ensure participation of local contractors during construction.
- To assist in resolving social or environmental issues that may arise during construction.

6.4. METHOD STATEMENT

A method statement outlines construction activities to be undertaken with mitigation measures. The contractor should give a written statement to the resident engineers at least two weeks before the activity so that any irregularities can be handled before construction commences and communicated to the Employees. The format of the method statement should clearly indicate the following:

1. Construction and Operational Procedures
2. Materials and Equipment used
3. How and where materials will be stored
4. When actions will be undertaken

Based on the EMPR specifications, the following method statements are required as a minimum:

- Site clearing
- Site layout and establishment
- Cement mixing
- Waste management procedures
- Wastewater management procedures
- Erosion remediation
- Fire control and emergency procedures

6.5. ENVIRONMENTAL AWARENESS TRAINING

The Letsemeng Local Municipality Employees, contractor's workforce and sub-contractors involved with the work in the construction phase are to be briefed on their obligation towards environmental protection and methodologies in terms of the EMPr prior to work commencing.

The briefing should be done by the Designated Environmental Officer prior to construction in the form of an on-site talk (toolbox talks).

The basic rules of conduct, which should be considered for the duration of the project, are shown in *Table 2* below.

Table 2: Basic conduct rules during construction

Do	Do Not
Use of toilet facilities provided and report	Make open fires for cooking, dedicated areas should be provided.
Clear your work areas of litter and building rubbish at the end of each day	Allow any cement bags or litter to be blown around
Report all leakages and/or spillages	Access the neighboring properties without the owners' consent
Confine work and storage of equipment and comply with all safety procedures	Collect fire wood from the neighboring farms
Provide easily accessible fire extinguisher and in good working condition	Dispose of cigarettes and burning matches randomly
Use areas designated for food preparation	Do not leave food lying around
Only emergency repairs of construction vehicles are allowed on the construction site	Enter any fenced off neighboring areas
Use all safety equipment and comply with all safety procedures	Dump any waste substance into the donga
Prevent excessive dust and noise	Dump any hazardous material into the watercourses.
	Abstract water from the earth dams and/or stream without approval or authorisations.
	Stockpile material on the seasonal drainage lines.

6.7. RECORD KEEPING

There should be an up to date filing system at the site office for the duration of the project whereby method statements, environmental incidents report, training records, audit reports and public complaints register are kept. It is advised that photographs of the site should be taken pre-, during and post-construction as a visual reference. These records should be kept for a minimum of 2 years after completion of the project.

6.8. PENALTIES

In cases of transgressions and non-compliance regarding the EMPR by the contractor, they should be liable to a penalty fine. The penalty fine could be paid to an organization that works to protect and conserve the environment in various ways or could be saved for the upkeep of the new Stone Tool Knapping site located near the facility. Transgressions should be recorded in a dedicated register and be kept at the site office for the duration of the project. The resident engineer will issue the penalties in terms of the severity of the environment; however, *Table 3* below may be used as a guideline.

Table 3: Penalties for transgressions

TRANSGRESSION	PENALTY
Littering and defecation in the bush	R1000
Concrete mixing on the ground	R2000
Spillages	R1000-R10 000 depending on the magnitude)
Soil erosion	R2000
Veld fires	R5000

6.9. DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

The Draft Environmental Management Programme is outlined in *Table 4* below. Adherence to this plan during construction will ensure that the environmental impacts associated with the proposed development will be mitigated, thus promoting sustainable development. The commitment and co-operation of the identified responsible person (s) will ensure effective implementation of the EMPr from pre-construction to post-construction. It is therefore imperative that there be a file dedicated for Environmental Documentation.

Table 4: Environmental Management Programme

ASPECT	POSSIBLE IMPACT	MITIGATION PLAN	RESPONSIBLE PERSON (S)	OBJECTIVES	FREQUENCY
1. PRE-CONSTRUCTION PHASE					
Project Contract and Programme	Adherence to the conditions of the WML and EMPr	◊ The environmental responsibilities should be formalized, and environmental awareness should be taught to the laborers in their preferred language as toolbox talks.	**RESIDENT ENGINEERS & CONTRACTOR**	Ensure that EMPR is adhered to	Frequency Once off, prior to commencement of construction activities
MANAGEMENT ACTION		Copy of the EMPr included in the contractual agreement and a designated person responsible for monitoring compliance to the EMPr for the duration of the construction phase.			
Location of Camp and Depot	Environmental damage	◊ The camp depot should be in an area where the dirt road users and Eskom personnel are not disturbed or inconvenienced. ◊ The contractor must provide the layout plan of the camp depot for approval before commencement of the construction phase. The plan should include site offices, temporary fencing boundary, sanitation facility, waste and petroleum products storage facilities, stockpiling areas, etc. The parking of vehicles, storage of equipment and materials must strictly be confined to designated areas. ◊ If located on the "virgin" ground, area to be rehabilitated once the project is completed but it is recommended that construction should be within the footprint of the development. ◊ No camp depot should be established on the identified no-go areas.	**RESIDENT ENGINEERS & CONTRACTOR**	Prevent environmental damage and disturbance of identified sensitive areas and the neighboring land users or encroachment to the Eskom powerline and/or transmission plant	Frequency Once off

MANAGEMENT ACTION		An approved camp depot layout by the Resident Engineer and demarcated sensitive areas			
Water Supply	Source of water during the construction phase.	◊ Potable water must be available at the camp depot, office site and construction site. ◊ It should be obtained from the Letsemeng Local Municipality.	**RESIDENT ENGINEERS, CONTRACTOR & MUNICIPALITY**	Ensure availability of water for various uses, especially portable water	Frequency Duration of the project
MANAGEMENT ACTION		A written agreement between the Engineers and Municipality regarding water supply or any service provider			
Access Control	Hazards to animals, and stealing of construction materials	◊ A Fence or suitably secured camp depot, main site office and material storage area should be established with access control. ◊ Unauthorized entry should be prohibited.	**RESIDENT ENGINEERS & CONTRACTOR**	Keep the site secure from trespassing, minimize possibility of theft and keep the grazing livestock out.	Frequency Duration of the project
MANAGEMENT ACTION		Site access register and complaints book should be in place.			
Power Supply	Safety Impacts	◊ All health and safety laws and regulations must be adhered to. ◊ No work should be allowed under the Eskom servitudes. ◊ A safety officer should be appointed to undertake safety audits.	**RESIDENT ENGINEERS & CONTRACTOR**	Implement safety measures	Frequency Monthly
MANAGEMENT ACTION		Observation of illegal electrical connections to the grid or use of alternative energy			

ASPECT	POSSIBLE IMPACT	MITIGATION PLAN	RESPONSIBLE PERSON (S)	OBJECTIVES	MONITORING ACTION AND FREQUENCY
Solid Waste	Littering/ Pollution of environment with waste materials	◊ Temporary site should be identified for storage of general and hazardous waste. ◊ System for regular waste removal must be set up. ◊ Letter of agreement or appointment letter between the local municipalities and the locally sourced contractor dealing with hazardous waste should be kept on site always.	**RESIDENT ENGINEERS & CONTRACTOR**	Ensure proper waste management is in place	Frequency Duration of the Project
MANAGEMENT ACTION		Method Statement for storing, handling, and disposal of waste (Waste Management)			
Sewage	Pollution of environment by waste materials	◊ Adequate sanitation facilities must be provided. ◊ Letter of consent from a registered waste facility to allow the contractor to empty the toilets in their sewer system should be in the environmental document.	**RESIDENT ENGINEERS & CONTRACTOR**	Prevent environmental pollution	Frequency Duration of the project
MANAGEMENT ACTION		Agreement with the service provider for supply and upkeeping of chemical toilets.			
Social & Socio-Economic Aspects	Dissatisfaction	◊ A project steering committee (PSC), which comprises of the municipality, Engineers, contractor, community representatives must be convened, and details of the project discussed. ◊ PSC must meet regularly to address any concerns/ issues	**RESIDENT ENGINEERS, CONTRACTOR & COMMUNITY MEMBERS**	Ensure satisfaction of workers and neighbouring land users	Frequency Monthly

		regarding the project from the community and/or labourers.			
MANAGEMENT ACTION		Contravening of PSC meetings once a month for duration of the construction phase and Records of the Minutes			
Health & Safety	Danger to the neighbouring landusers and labourers	◊ The site should be clearly demarcated/fenced of for safety reasons, community and passerby should not be allowed on the construction site as a precautionary measure. ◊ Safety signs complying with SABS and SANS standards should be placed on-site in a manner clearly visible to the public ◊ Construction methods should adhere to the Occupational Health and Safety Act (Act 85 of 1993). ◊ A safety officer should arrange a safety awareness meeting with the Luckhoff community.	**RESIDENT ENGINEERS & CONTRACTOR**	To create a working environment that is not harmful to the health and wellbeing of the neighbouring land users and labourers.	Frequency Once off
MANAGEMENT ACTION		Appointment of a Safety Officer, records of Toolbox Talks and risk register should be in place			
Access route	Possible erosion due to the disturbance of the access road	◊ Upgrade the existing access road branching off from Rabie Street to an acceptable condition prior to construction ◊ Proper maintenance should be done to ensure the quality of the access road.	**RESIDENT ENGINEERS, CONTRACTOR**	To improve the condition of the access road and minimize possibility of erosion.	Frequency For the duration of the construction period
MANAGEMENT ACTION		Inspection of the road condition and photographic records			

2. CONSTRUCTION PHASE					
ASPECT	**POSSIBLE IMPACT**	**MITIGATION PLAN**	**RESPONSIBLE PERSON**	**OBJECTIVES**	**MONITORING ACTION FREQUENCY**
Health & Safety	Danger to the workforce	◊ The Contractor should provide employees with suitable equipment to protect them from hazards being presented and that will allow them to work without risk to the health in a hazardous environment, e.g. hard hats, gloves, boots, etc. ◊ An emergency preparedness plan should be compiled and approved by the resident engineer and ECO before construction commences. ◊ A list of all emergency telephone numbers, i.e. fire, ambulance, ECO, engineers, etc. should be available all the time at various construction sites.	**RESIDENT ENGINEERS, CONTRACTOR & ECO**	To create a working environment that is not harmful to the health and wellbeing of the workforce.	Frequency Once off
MANAGEMENT ACTION		Safety audit reports			

ASPECT	POSSIBLE IMPACT	MITIGATION PLAN	RESPONSIBLE PERSON	OBJECTIVES	MONITORING ACTION FREQUENCY
Flora	Loss of vegetation and damage to protected and endangered species	◊ A final ecological walkthrough be conducted to confirm the locations of all individuals of the provincially protected Aloe species on site and that they subsequently be removed prior to the commencement of the construction phase and adequately relocated to a suitable, similar open area. ◊ A Provincial Flora Permit has to be obtained prior to the commencement of any construction activities. ◊ A Plant Relocation Management Plan must be compiled by a suitably qualified and experienced ecologist for the removal process	**CONTRACTOR, ENGINEER, ECO & BOTANIST**	Prevent impacts on flora and destruction of Protected Species	Frequency Once off
Flora	Loss of Vegetation	◊ Construction must be limited to the development footprint. ◊ No construction of roads outside the development site recommended, except for the identified access road.	**CONTRACTOR, ENGINEER, & ECO**	To prevent loss of vegetation outside the development footprint	Frequency Duration of the Project

ASPECT	POSSIBLE IMPACT	MITIGATION PLAN	RESPONSIBLE PERSON	OBJECTIVES	MONITORING ACTION FREQUENCY
Flora	Loss of indigenous vegetation due to infestation of alien invasive species	◊ All declared alien plant species must be effectively cleared from the assessment area and be disposed of in accordance with the National Environmental Management; National Biodiversity Act (Act 10 of 2004); Alien Invasive Species Regulations, 2014. ◊ Adequate alien invasive plan to be implemented during construction, should the authority be granted the proponent must appoint the relevant specialist. ◊ No site construction camp to be established in any natural surrounding areas outside the proposed development area. ◊ Manual or mechanical removal of alien invasive species must be used.	**CONTRACTOR, ENGINEER & ECO**	To control alien invasive species	Frequency Duration of the
MANAGEMENT ACTION		Appointment of a Botanist to conduct a search and rescue but a permit should be obtained first from DESTEA. Monthly ECO Monitoring Compliance Report, Alien Invasive Plan, Photographs taken before the clearance of the site.			

ASPECT	POSSIBLE IMPACT	MITIGATION PLAN	RESPONSIBLE PERSON (S)	OBJECTIVES	MONITORING ACTION FREQUENCY
Fauna	Disturbance to fauna in the area	◊ Representative portion of the rocky ridge should be adequately buffered out of the proposed development footprint area. ◊ No hunting, snaring, shooting, nest raiding or egg collection by the construction staff should be allowed. ◊ Toolbox talks should include handling of animals.	**CONTRACTOR, ENGINEER & ECO**	Prevent killings of animals and destruction/ degradation of areas (habitats) not included in the development footprint.	Frequency Duration of the contract
MANAGEMENT ACTION		Records of Toolbox Talks, ECO reports and cordoning of the portion of the rocky ridge outside the development footprint. Photographic records			
Geology and Soil	Loss of Topsoil	◊ Exposure of bare ground will be minimized. Topsoil stripping should be limited, and it should be stored separately from the subsoil, i.e. no mixing of soils. ◊ In situ material should be removed to an average depth of 1000mm. ◊ Soil conservation measures such as berms, gabions and mats should be used on-site to help reduce erosion. ◊ Topsoil stockpiles should be kept free of litter and weeds.	**CONTRACTOR, ENGINEER & ECO**	Conserve and protect topsoil from erosion and deterioration	Frequency Duration of the contract
MANAGEMENT ACTION		ECO audit checklist, photographs			

ASPECT	POSSIBLE IMPACT	MITIGATION PLAN	RESPONSIBLE PERSON (S)	OBJECTIVES	MONITORING ACTION AND FREQUENCY
MANAGEMENT OUTCOME		ECO Audit Report, Safety Audit report and Complaints Register			
Air Quality	Nuisance and reduction in visibility	◊ Suitable dust suppression and prevention measures to be implemented ◊ Adequate rehabilitation to prevent significant dust emission.	**CONTRACTOR, ENGINEER & ECO**	To avoid excessive generation of dust and improved visibility on the construction site	Frequency As and when required
MANAGEMENT ACTION		Availability of a water tank to be used for dust suppression when required			
Noise	Nuisance	◊ Construction should be limited to normal contractors' working days and working hours. ◊ Ensure that employees and staff conduct themselves in an acceptable manner while on site, both during work hours and after hours. ◊ Limit working hours of noisy equipment to daylight hours, ◊ Fit silencers to the noisier construction equipment.	**CONTRACTOR, ENGINEER & ECO**	To avoid excessive noise generation from site operations	Frequency Duration of the construction period
MANAGEMENT ACTION		No sensitive noise receptors nearby thus no management action required except for provision of Personal Protection Equipment, e.g. hearing aids			
Waste Management	Littering/ Pollution	◊ All waste should be appropriately separated, contained and disposed of and be removed to the existing municipal solid waste site during the construction period. ◊ Reduction, reuse and recycling of waste should be introduced.	**CONTRACTOR, ENGINEER & ECO**	Provide facilities for appropriate collection and disposal of solid waste and sewage	Frequency Duration of the construction period

		◊ Illegal dumping should be forbidden. ◊ No dumping of builders' rubble or other materials within the newly proposed servitude area. ◊ Toolbox talks should include a component of waste management. ◊ Good housekeeping practices.			
MANAGEMENT ACTION		Provision of refuse bins with lids, marked storage facilities for hazardous waste.			
Sewerage	Pollution of the receiving environment	◊ Adequate sanitation facilities *i.e*., 15 employees per facility should be provided. ◊ The toilets should be located at least 50m from the construction site. ◊ They should be kept clean and hygienic regularly to ensure that they are usable. ◊ Effluent must not be discharged into the natural environment and defecating in the bush is prohibited.	**CONTRACTOR, ENGINEER & ECO**	Provide facilities for sanitation	Frequency Duration of the construction period
MANAGEMENT ACTION		Provision of easily and clean sanitation facilities.			
Water Supply	Source of potable water during the construction phase.	◊ Potable water must be made available at the camp site and construction site in clearly marked containers.	**CONTRACTOR, ENGINEER & ECO**	Water supply must be made available	Frequency Duration of the contract period

ASPECT	POSSIBLE IMPACT	MITIGATION PLAN	RESPONSIBLE PERSON (S)	OBJECTIVES	FREQUENCY
Power Supply	Safety Impacts	◊ Limit the power supply cables & ensure the safety of the workers. ◊ All health and safety laws and regulations should be adhered to.	**CONTRACTOR, ENGINEER & ECO**	Avoid health and safety impacts	Frequency Duration of the contract period
MANAGEMENT ACTION		Safety Audit Reports			
Stormwater	Contamination of storm water	◊ Stormwater must be diverted away from the construction works. ◊ Storm water control works must be constructed, operated and maintained in a sustainable manner throughout the project. ◊ Construct and operate the necessary collection facilities and stormwater management systems such as diversion berms, ditches, drains, oil separation sumps, and gross waterways etc. to prevent contaminated water from leaving the construction site. ◊ The stormwater designs should not alter the drainage patterns of the site; they should reflect the positions of the natural drainage lines.	**CONTRACTOR, ENGINEER & ECO**	Protect water quality of neighbouring watercourses	Frequency Duration of the construction period
MANAGEMENT ACTION		Stormwater Management Plan must be in place			

ASPECT	POSSIBLE IMPACT	MITIGATION PLAN	RESPONSIBLE PERSON (S)	OBJECTIVES	FREQUENCY
Loss of topsoil	To prevent the possibility of soil erosion	◊ Topsoil stripping should be limited to the development footprint and should be stripped to a 300mm depth. It should be stored separately from subsoil, i.e. no mixing of soils on a similar soil horizon. ◊ Stockpiles should be away from drainage lines. ◊ Exposure of bare soil must be minimized. ◊ Stockpiled topsoil must be protected by erosion control measures. ◊ Vehicle movement should be limited to the access road and development footprint.	**CONTRACTOR, ENGINEER & ECO**	Prevent soil erosion	Frequency Duration of the construction period
MANAGEMENT ACTION		Designated topsoil stockpile area and erosion control measures must be in place.			
Traffic Impact	Safety/ Traffic Impacts	◊ Vehicle speed on the site should be limited speed to 40km/h. ◊ Only drivers with valid licenses should be allowed to drive on the site. ◊ All traffic laws must be allowed to ◊ Traffic signs complying with SABS and SANS standards should be placed on-site in a	**CONTRACTOR, ENGINEER & ECO**	Minimize the disruption to road users	frequency Duration of the project

		manner clearly visible to the public.			
MANAGEMENT ACTION		Visible construction traffic signs.			
Fire Hazard	Risk of veld fires on human and animal life	◊ No open fires are permitted on the construction site, except under strictly controlled conditions subject to the National Veld and Forest Act, (Act No. 101 of 1998). ◊ The contractor and laborers should be informed and advised on the associated risks, dangers and damage of property caused by accidental fires and how to prevent them. ◊ Fire-fighting equipment should be made available at the construction site, and the laborers should be informed of their location and trained to use them. ◊ Restrict smoking activities to demarcated smoking activities.	**CONTRACTOR, ENGINEER & ECO**	Prevent veld fires.	Frequency Duration of the construction period
MANAGEMENT ACTION		A fire management plan should be in place and inclusion of fire management in the toolbox talks			
Vehicle Servicing Areas	Water and soil pollution	◊ Vehicle servicing should be done at the identified camp depot on impermeable surfaces to minimize the likelihood of petrochemical spills on the soil. ◊ In the case of accidents, polluted soil should be appropriately treated or taken	**CONTRACTOR, ENGINEER & ECO**	To avoid contamination of soil and water resources	Frequency Duration of the Project

		away to an appropriate disposal site. ◊ Used spares must be collected and disposed of in the correct manner. ◊ Oils must be drained into a suitable container, transferred to a larger storage container, and then supplied to oil recycling companies. ◊ Oil must under no circumstances be disposed off into stream or the ground.			
MANAGEMENT ACTION		A designated maintenance area must be identified and no incidents reported			
Areas of Paleontological, Cultural and/or Historical Importance	Disturbance of important scientific artefacts	◊ In the event that fossil remain are uncovered during any phase of construction, either on the surface or unearthed by new excavations and vegetation clearance, the ECO in charge of the development ought to be alerted immediately. These discoveries ought to be protected and the ECO must report to SAHRA so that the appropriate mitigation can be carried by a professional. ◊ A Phase 2 AIA should be undertaken prior to commencement of construction so that residual surface stone tool artefacts within the development footprint are	**CONTRACTOR, ENGINEER AND ENVIRONMENTAL COMPLIANCE OFFICER**	Prevent disturbance of scientific artefacts.	<u>Frequency</u> Duration of the Contract

		mapped, recorded and relocated to the fenced off factory near the construction site. ◊ Should any human skeletal remains be found during excavations, work must stop in the area. The findings should be reported immediately to SAHRA.			
MANAGEMENT ACTION		A report from an Archaeologist on Phase 2 AIA and relocation of archaeological artefacts			
Cement Mixing	Pollution of soils, surface and groundwater	◊ Mixing of cement should be done at specifically selected areas on mortar boards or similar structures to contain surface run-off. ◊ Cleaning of cement mixing equipment should be done on proper cleaning trays. ◊ No cement or cement containers should be left lying around.	**CONTRACTOR, ENGINEER & ECO**	Prevent pollution of surface water and soil.	<u>Frequency</u> Duration of the contract period

ASPECT	POSSIBLE IMPACT	MITIGATION PLAN	RESPONSIBLE PERSON	OBJECTIVES	MONITORING ACTIONS AND FREQUENCY
3. POST CONSTRUCTION PHASE					
Aesthetic view of the area	Aesthetic pollution	◊ The contractor should rehabilitate the site when construction is completed, thus a detailed rehabilitation plan should be provided by the contractor. ◊ The site must be kept clear of litter and all waste must be removed and properly disposed of. ◊ All stockpiles must be handled are directed by engineers if not spoilt. ◊ The original site topography should be restored as much as possible. ◊ Grading and levelling should match the adjacent ground and to help prevent soil erosion. ◊ A final audit must be completed before the contractor may leave the site to determine whether all requirements were met. ◊ A meeting must be held between the various stakeholders to ensure that the site has been restored to a satisfactory condition.	**CONTRACTOR, ENGINEER AND ENVIRONMENTAL COMPLIANCE OFFICER**	Prevent pollution	Frequency Monthly

ASPECT	POSSIBLE IMPACT	MITIGATION PLAN	RESPONSIBLE PERSON	OBJECTIVES	FREQUENCY
4. OPERATION PHASE					
OPERATION AND MAINTENANCE PLAN MUST BE COMPILED BY THE ENGINEERS					
Waste Classification and Inspection	Disposal of acceptable waste material	◊ Waste should be weighed at the weighbridge before being dumped for sorting. ◊ No waste classification is required for general waste	**MUNICIPALITY**	To ensure only allowed waste is disposed and to keep records of waste quantities	Frequency Duration of the operation phase
Aesthetic view of the area	Windblown litter	◊ Ensure that sufficient water storage and disposal measures are implemented to adequately manage and contain waster. ◊ The community and the municipality team should implement annual clean ups.	**MUNICIPALITY & COMMUNITY MEMBERS**	Prevention of plastic and another windblown liter	Frequency Duration of the Operation Phase

Ground water	Pollution of groundwater resources	◊ Water facility to be properly placed to prevent undesired seepages or leakages into the groundwater. ◊ The lining to be re-evaluated annually to ensure functionality. ◊ Ground water samples to be collected every six months to monitor the status of the water.	**MUNICIPALITY**	Maintain good water quality	Frequency 6-months cycle
Stormwater	Inefficient functioning of the stormwater system in managing surface water runoff	◊ Management of all storm water systems to keep them in working condition. ◊ Storm water handling must be done accordingly to prevent soil erosion.	**MUNICIPALITY**	Ensure effectiveness of the stormwater management system and prevent ponding/flooding on site.	Frequency For the duration of the operation phase

7. AUDIT AND MONITORING

Compliance monitoring provides useful information for gauging environmental performance throughout the duration of the project. The information obtained can be used to gauge how effective the mitigation plans in the EMPr are and determine whether the corrective actions undertaken are adequate and whether some modifications are required. The resident engineer should monitor the overall aspects of the project, e.g. labor issues and complaints raised by the local farming community, so they can be addressed in conjunction with the Project Steering Committee. The ECO should monitor construction activities at least once a month and the monthly reports should be compiled and presented to the PSC for discussion if needs be. It is highlighted that regular meetings between the resident engineer, site manager and ECO should be held to ensure that anticipated environmental impacts are within predicted levels, e.g. noise generation and the implementation of the EMPr is effective. A designated Environmental Officer should be on site for the duration of the construction phase to ensure that the conditions of the Waste Management License and EMPr are adhered to.