

**APPLICATION FOR
AN ENVIRONMENTAL AUTHORISATION
FOR THE
CONSTRUCTION OF A WATER SUPPLY PIPELINE
AT THE DUVHA POWER STATION,
MPUMALANGA PROVINCE**

FINAL ENVIRONMENTAL MANAGEMENT PROGRAMME - JUNE 2016



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Authors: Ndomupei Dhemba

Reviewer: Terry Calmeyer

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Professor Martin van Veelen
Director: NAKO-ILISO

ENVIRONMENTAL AUTHORISATION APPLICATION FOR THE CONSTRUCTION OF A WATER SUPPLY PIPELINE AT DUVHA POWER STATION, MPUMALANGA PROVINCE

ENVIRONMENTAL MANAGEMENT PROGRAMME

TABLE OF CONTENTS

1.	INTRODUCTION	1-1
1.1	BACKGROUND	1-1
1.2	PURPOSE OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME	1-3
1.3	PROJECT TEAM	1-4
	1.3.1 Details and Expertise of the Environmental Assessment Practitioner (EAP)	1-4
	1.3.2 Details of the Project Team.....	1-4
1.4	STRUCTURE OF THE EMPR.....	1-7
2.	PROJECT DESCRIPTION	2-1
2.1	CONSTRUCTION OF THE WATER SUPPLY PIPELINE	2-1
2.2	SERVICES.....	2-5
	2.2.1 Water for construction purposes	2-5
	2.2.2 Power	2-5
	2.2.3 Sanitation	2-5
	2.2.4 Contractors Camp and Laydown Area	2-5
	2.2.5 Access Roads.....	2-5
2.3	MATERIALS HANDLING	2-5
	2.3.1 Stockpiles of Raw Materials.....	2-5
	2.3.2 Fuel Display.....	2-6
	2.3.3 Construction Materials	2-6
2.4	EMPLOYMENT	2-6
	2.4.1 Occupational Health and Safety	2-6
2.5	PROJECT TIMING.....	2-7
3.	ROLES; RESPONSIBILITY AND COMPLIANCE MONITORING	3-1
3.1	DEPARTMENT OF ENVIRONMENTAL AFFAIRS (DEA).....	3-1
3.2	ESKOM HOLDINGS SOC LTD	3-1
3.3	CONTRACTOR.....	3-2
3.4	ENVIRONMENTAL CONTROL OFFICER (ECO).....	3-2
3.5	CONTRACTOR MANAGEMENT	3-3
3.6	INCIDENTS AND NON-CONFORMANCES.....	3-3

3.7	PENALTIES AND FINES	3-5
4.	ENVIRONMENTAL PRINCIPLES AND LEGAL REQUIREMENTS	4-1
4.1	ENVIRONMENTAL PRINCIPLES	4-1
4.2	COMPLIANCE WITH LEGISLATION AND REGULATION	4-1
4.2.1	Required environmental permits, licences and authorisations.....	4-1
5.	EMPR FOR CONSTRUCTION	5-1
5.1	SITE ESTABLISHMENT AND CONSTRUCTION LAYDOWN AREA	5-2
5.1.1	Site Clearance	5-2
5.1.2	Ablution facilities.....	5-2
5.1.3	Eating Areas.....	5-3
5.1.4	Environmental Awareness	5-4
5.1.5	Hazardous Material handling and storage.....	5-6
5.2	MATERIAL SOURCING AND EARTHWORKS	5-9
5.2.1	Material Sourcing.....	5-9
5.2.2	Earthworks and Stockpiles.....	5-9
5.3	NOISE CONTROL MANAGEMENT AND MITIGATION PLAN	5-10
5.4	DUST ABATEMENT AND MITIGATION PLAN	5-11
5.5	WASTE MANAGEMENT AND MITIGATION PLAN.....	5-12
5.5.1	Domestic waste	5-13
5.5.2	Inert waste	5-14
5.5.3	Hazardous waste	5-15
5.5.4	Handling and disposal of contaminated waste water	5-16
5.6	EMERGENCY PREPAREDNESS PLAN.....	5-17
5.6.1	Spill Management Plan.....	5-17
5.6.2	Fire Management Plan	5-18
5.7	SOIL PROTECTION AND EROSION MANAGEMENT PLAN	5-19
5.7.1	Soil Erosion Mitigation Measures.....	5-19
5.7.2	Groundwater and soil contamination mitigation measures	5-20
5.8	WATER MANAGEMENT AND MITIGATION PLAN	5-21
5.8.1	General.....	5-21
5.8.2	Storm Water Management.....	5-22
5.8.3	Water abstraction	5-23
5.8.4	Pollution control and discharge measures	5-23
5.8.5	Water conservation and recycling	5-24
5.8.6	Wetland preservation.....	5-25
5.9	TRAFFIC AND TRANSPORTATION MANAGEMENT PLAN	5-26
5.9.1	Construction signage.....	5-26

5.9.2	Traffic movement of construction vehicles	5-27
5.10	FLORA, FAUNA AND AVIFAUNA MANAGEMENT	5-27
5.10.1	Protection of ecologically sensitive areas/habitats	5-27
5.10.2	Weeds and alien vegetation.....	5-28
5.10.3	Terrestrial Biodiversity	5-29
5.10.4	Flora	5-29
5.10.5	Fauna	5-31
5.10.6	Invasive alien vegetation	5-31
5.11	SOCIO-ECONOMIC MANAGEMENT PLAN	5-32
5.11.1	Maximise new business sales, multiplier effects	5-32
5.11.2	Maximum Employment and Skills transfer	5-33
5.11.3	Minimise in-migration and effect of temporary workers	5-34
5.11.4	Minimise Health, safety and security impacts	5-35
5.11.5	Minimise nuisance noise and other disruptions a.....	5-36
5.11.6	Minimise impacts on Duvha Primary School	5-37
5.11.7	Complaints management.....	5-38
5.12	HERITAGE MANAGEMENT AND MITIGATION PLAN	5-39
5.12.1	Chance heritage finds.....	5-39
5.13	SITE REHABILITATION.....	5-39
5.13.1	Disturbed areas to be rehabilitated	5-40
6.	MANAGEMENT AND MITIGATION PLANS FOR OPERATION.....	6-1
6.1	WEEDS AND ALIEN VEGETATION	6-1
7.	REHABILITATION	7-2
7.1	REHABILITATION OBJECTIVES.....	7-2
7.2	REHABILITATION PHASE.....	7-2
7.2.1	Removal of structures and infrastructure	7-2
7.2.2	Inert waste and rubble	7-2
7.2.3	Hazardous waste and pollution control	7-3
8.	MONITORING PROGRAMME	8-1
8.1	PHOTOGRAPHIC RECORD.....	8-1
8.2	ENVIRONMENTAL MONITORING	8-1
9.	ENVIRONMENTAL AWARENESS PLAN.....	9-1

LIST OF TABLES

TABLE 1-1:	SUMMARY OF THE ILISO PROJECT TEAM AND THEIR ROLES ..	1-4
TABLE 1-2:	SPECIALIST STUDIES UNDERTAKEN.....	1-5
TABLE 3-1:	CLASSIFICATION OF ENVIRONMENTAL INCIDENT.....	3-4

TABLE 8-1: ENVIRONMENTAL MONITORING PROGRAMME 8-2

LIST OF FIGURES

FIGURE 1-1: LOCATION OF THE PROPOSED WATER SUPPLY PIPELINE 1-2
FIGURE 2-1: PROPOSED PIPELINE ROUTE 2-1
FIGURE 2-2: INTERCONNECTING VALVE 2-2
FIGURE 2-3: SCHEMATIC DIAGRAM OF THE PROPOSED PIPELINE..... 2-3
FIGURE 2-4: STEEL PIPE SUPPORTS 2-4
FIGURE 2-5: CURRENT STATE OF THE PIPE SUPPORTS ON SITE..... 2-4
FIGURE 3-1: INSTITUTIONAL ARRANGEMENTS 3-1
FIGURE 5-1: *BOOPHANE DISTICHA* OBSERVED ON SITE. 5-30
FIGURE 5-2: PROJECT AREA WHERE SCC WERE ENCOUNTERED 5-30

LIST OF ABBREVIATIONS

BA:	Basic Assessment
BBBEE:	Broad Based Black Economic Empowerment
CARA:	Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983)
DEA:	Department of Environmental Affairs
DRC:	Democratic Republic of Congo
DWS:	Department of Water and Sanitation
EA:	Environmental Authorisation
EAP:	Environmental Assessment Practitioner
ECO:	Environmental Control Officer
EIA:	Environmental Impact Assessment
EMPr:	Environmental Management Programme
EO:	Environmental Officer
GIS:	Geographic Information System
HAS:	Hazardous Substances Act, 1993 (Act 85 of 1993)
HDPE:	High Density Polyethylene
IAIA:	International Association of Impact Assessment
KWS:	Komati Water Scheme
MS:	Method Statements
MSDS:	Material Safety Data Sheets
NEMA:	National Environmental Management Act, 1998 (Act no. 107 of 1998)

NEMBA:	National Environmental Management: Biodiversity Act, 2004 (Act No 10 of 2004)
NEMWA:	National Environmental Management: Waste Act 2008 (Act 59 of 2008)
NHRA:	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NWA:	National Water Act, 1998 (Act 36 of 1998)
OHSA:	Occupational Health and Safety Ac, 1993 (Act 85 of 1993)
PPE:	Personal Protective Equipment
PPP:	Public Participation Process
SANS:	South African National Standards
SANCOLD:	South African Committee on Large Dams
SCC:	Species of Conservation Concern
UV:	Ultraviolet
WTP:	Water Treatment Plant
WUL:	Water Use Licence

ENVIRONMENTAL AUTHORISATION APPLICATION FOR THE CONSTRUCTION OF A WATER SUPPLY PIPELINE AT DUVHA POWER STATION, MPUMALANGA PROVINCE

ENVIRONMENTAL MANAGEMENT PROGRAMME

APRIL 2016

1. INTRODUCTION

1.1 BACKGROUND

Eskom Holdings SOC is proposing to construct a 2.287 km water supply pipeline at Duvha Power Station. The proposed pipeline will be situated on the Remaining Portion (Portion 0) of Farm Duvha Kragstasie 337JS (**Figure 1-1**) in the Mpumalanga Province.

Duvha Power Station receives water from two sources; the Komati Water Scheme (KWS) (Komati Water) and the Usutu-Vaal River System (Vaal Water). Komati Water is of a better quality and is the preferred source to produce demineralised and potable water. The Department of Water and Sanitation (DWS) has however scheduled parts of the KWS for an outage from the middle of 2016. The outage will impact the supply of Komati Water to Duvha Power Station. Duvha Power Station has two raw water reservoirs which can be independently filled with the Vaal Water and the Komati Water.

To mitigate the impact of the outage, the reserve capacity of the Komati water reservoir will be maximised by using Vaal Water as a source of make-up water for the cooling water systems on the South side of the power station instead of Komati water. Komati water will be reserved for use in the water treatment plant (WTP). Modification to the pipeline network is required to achieve the supply of Vaal Water for cooling and Komati Water for treatment. This will require a connection pipeline to be installed from the Komati raw water reservoir to the Water Treatment Plant (WTP) on the south side of the Power Station, the "Komati Reservoir WTP Pipeline".

The project will entail the design, supply construction and commissioning of a new Ultraviolet (UV) Protected High Density Polyethylene (HDPE) pipeline from the Komati raw water reservoir to the WTP. The project will also include the design, supply, construction and commissioning of valves and pipe supports including fasteners and concrete plinths. It is estimated that a 450 mm pipeline with a water flow rate of 540 m³/hour will be required.

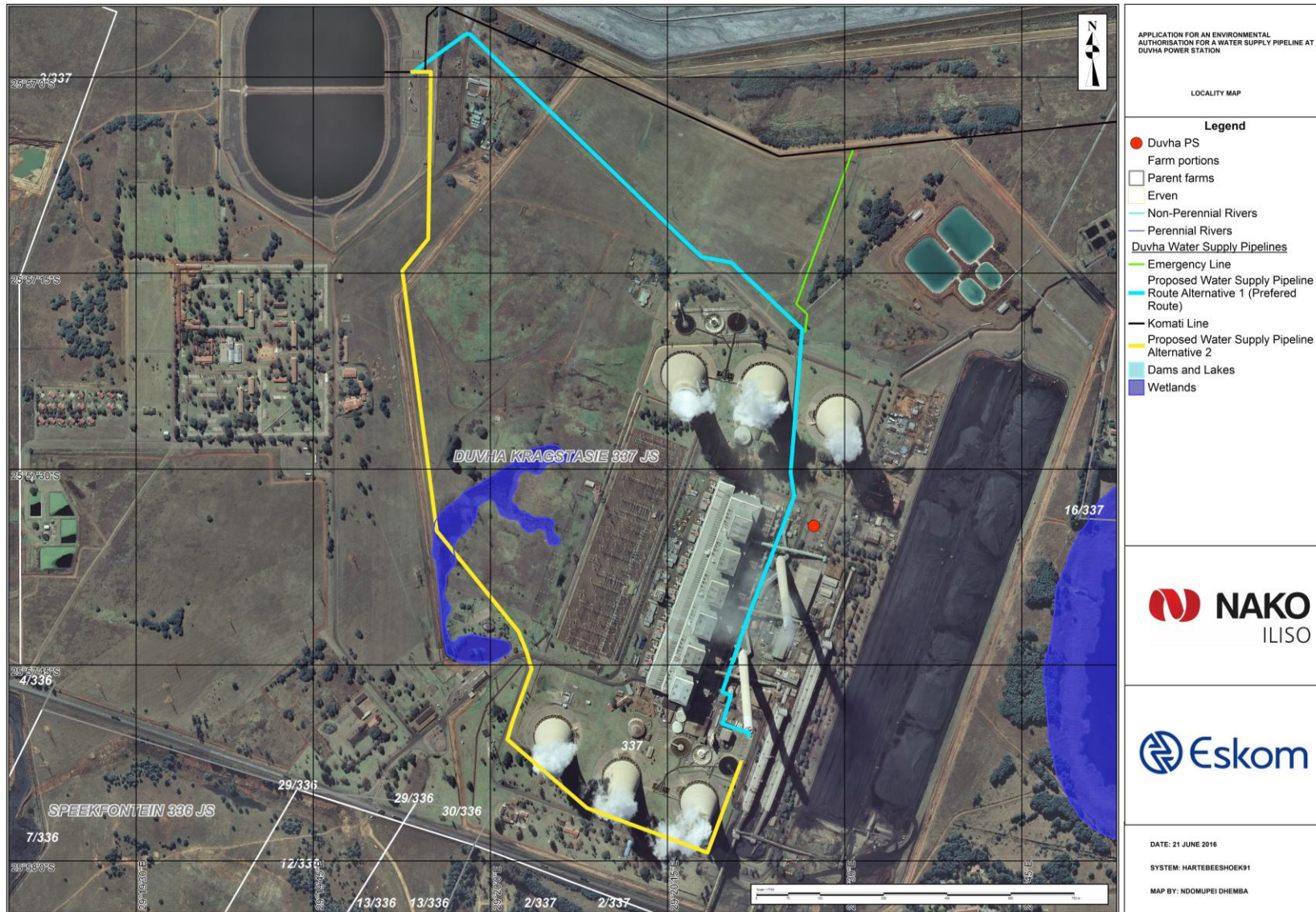


Figure 1-1: Location of the proposed water supply pipeline

1.2 PURPOSE OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME

The purpose of this Environmental Management Programme (EMPr) is to ensure that the impacts of the proposed project are kept to the minimum.

This EMPr is based on the principles of the National Environmental Management Act (Act no. 107 of 1998) (NEMA). These principles include:

- To avoid, minimise, or correct pollution and degradation of the environment;
- To avoid or minimise waste and to re-use or re-cycle waste where possible;
- To apply a risk averse and cautious approach;
- To anticipate and prevent negative impacts on the environment (physical, biological, social, economic, and cultural). Where these impacts cannot be prevented, such impacts must be minimized or remedied;
- That negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimized and remedied;
- Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option; and
- The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.

The NEMA stipulates that anyone who causes pollution or degradation of the environment is responsible for preventing impacts occurring, continuing or recurring and for the costs of repair of the environment. Other legislation that contain requirements which were taken into consideration in drafting the EMPr, include:

- National Environmental Management Act No. 107 of 1998;
- National Water Act, 1998 Act No. 36 of 1998; and
- Occupational Health and Safety Act No. 85 of 1993.

This EMPr among other things:

- Presents an action plan for the implementation of mitigation measures with the purpose of regulating the Contractor's conduct or method of working;

- Provides specific environmental guidance for construction and operation activities;
- Incorporates measures to manage and mitigate construction activities so that negative environmental impacts are avoided or reduced;
- Identifies and allocates responsibilities for specific actions associated with the management of construction activities to mitigate negative environmental impacts; and
- Provides an outline of the activities which require monitoring and the assessment thereof.

1.3 PROJECT TEAM

ILISO Consulting (Pty) Ltd was appointed as the independent Environmental Assessment Practitioner (EAP) to undertake the Environmental Impact Assessment (EIA) and compile the EMPr with input from the specialists.

1.3.1 Details and Expertise of the Environmental Assessment Practitioner (EAP)

Ms Ndomupei Dhemba is a registered SACNASP (Reg Number: 400045/14) Professional Environmental Scientist who has more than 10 years of Integrated Environmental Management experience. Her experience includes compiling Environmental Management Programmes, undertaking Public Participation Processes, providing Geographic Information System (GIS) Services and undertaking the processes and assessments to support applications for Environmental Authorisations, Water Use Licences, Waste Management Licences and Air Emission Licences, for roads, railway lines, power stations, airports, dams, housing developments, schools in South Africa, Zimbabwe and Uganda.

1.3.2 Details of the Project Team

In addition to the EAP, the ILISO Consulting (Pty) Ltd project team includes the following individuals: Mrs Terry Calmeyer (Project Leader) and Mr Joseph Masilela (Public Participation Process (PPP) administrator). A summary of the project team, their roles is provided in **Table 1-1** and **Table 1-2**.

Table 1-1: Summary of the ILISO Project Team and their Roles

Role	Project Team Member	Company
Project Manager/EAP	Mrs Terry Calmeyer	ILISO Consulting (Pty) Ltd
EAP and GIS	Ms Ndomupei Dhemba	ILISO Consulting (Pty) Ltd

Public Participation Process Administrator	Mr Joseph Masilela	ILISO Consulting (Pty) Ltd
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Table 1-2: Specialist Studies Undertaken

Specialist Study	Specialist	Company
Fauna, Flora and Wetland Assessment	Mr Emile van der Westhuizen	Scientific Aquatic Services
Social Impact Assessment	Mrs Nanja Churr	Kayamandi Development Services
Heritage Impact Assessment	Dr Johnny van Schalkwyk	Independent Consultant

A short description of the key qualifications and capabilities of the ILISO team members and Specialists are presented below.

Mrs Terry Calmeyer is a Director of ILISO Consulting Environmental Management (Pty) Ltd and a certified Environmental Assessment Practitioner (EAP). She has a Master's degree in Environmental Management and over 20 years' experience. She specialises in Environmental Impact Assessments, the environmental components of project implementation and Project Management. Terry serves on the International Association of Impact Assessment (IAIA) Council, is the past President of the South African Affiliation of the International Association of Impact Assessment and an active member of the South African Committee on Large Dams (SANCOLD), the Environmental Law Association and the International Association for Public Participation. She has been involved in a variety of EIAs including those for transmission lines, water supply projects, dams, roads, railways, waste water treatment works and airports, in South Africa, Uganda, Lesotho, Botswana, Namibia and Mozambique.

Mr Joseph Masilela has 9 years' experience in office administration and community liaison work. This includes arranging meetings, facilitating community workshops, meeting with traditional authorities and assisting on all project related work. Joseph assists with secretarial functions for projects including the maintenance of attendance registers and databases for all projects. He also undertakes field work and data input into AutoCAD programmes.

Mr Emile van der Westhuizen has 9 years' experience in Ecological Assessments and has a Bachelor of Science (BSc) Botany and Environmental Management degree

from UNISA and holds a BSc (Hons) Plant science degree with specialisation in terrestrial plant ecology from the University Of Pretoria. Emile's skills include GIS and Wetland Delineation processes. He has extensive experience in EIA's, BA's, and Water Use Licensing, the development of Rehabilitation Plans, Landscape plans and Visual Assessments. Emile has been involved in various projects throughout Africa (including South Africa, Ghana, the DRC and Mozambique) focusing on terrestrial ecological assessments which involve phytosociological community assessments, RDL faunal and floral species assessments, alien and invasive species control methods and rehabilitation plans.

Mrs Nanja Churr has 15 years' experience and Bachelor of Science Degree in Town and Regional Planning (cum laude). She has acquired excellent skills in the field of socio-economic and economic development of rural and urban communities, inclusive of the dynamic impacts associated with socio-economic and economic impact assessments, urban frameworks, economic frameworks, development plans, feasibility studies, urban revitalisation studies, integrated development planning, local economic development plans, socio-economic research, baseline surveys and needs assessment, rural and community development, policy analysis and formulation, macro-economic analysis, feasibility studies and business plan development. Nanja has also obtained valuable International Training in Canada on Regional Planning and Economic Investment Analysis, theory of economic development, and practice of Economic Development.

Dr J A van Schalkwyk, D Litt et Phil, heritage consultant, has been working in the field of heritage management for more than 30 years. Based at the National Museum of Cultural History, Pretoria, he has actively done research in the fields of anthropology, archaeology, museology, tourism and impact assessment. This work was done in Limpopo Province, Gauteng, Mpumalanga, North West Province, Eastern Cape, Northern Cape, Botswana, Zimbabwe, Malawi, Lesotho and Swaziland. He has curated various exhibitions at different museums and has published more than 60 papers. During this period he has done more than 1 500 impact assessments (archaeological, anthropological and social) for various government departments and developers. Projects include environmental frameworks, roads, pipelines, power lines, dams, mining developments, water purification works, historical landscapes, refuse dumps and urban developments.

1.4 STRUCTURE OF THE EMPR

The EMPr has been structured to include the following aspects:

Chapter 1 provides project background and team details;

Chapter 2 provides the summary of the project description;

Chapter 3 specifies roles, responsibilities and compliance monitoring requirements;

Chapter 4 highlights all relevant legislative requirements and principles;

Chapter 5 provides mitigation and management plans for the construction phase;

Chapter 6 provides Mitigation and Management Plans for the Operation Phase;

Chapter 7 provides Mitigation and Management Plans for the Rehabilitation Phase;

Chapter 8 provides the Monitoring programme; and

Chapter 9 provides the Environmental Awareness Plan

2. PROJECT DESCRIPTION

The project will entail the design, supply, construction and commissioning of a new UV resistant HDPE pipeline from the Komati raw water reservoir to the WTP. The project will also include the design, supply construction and commissioning of valves and pipe supports including fasteners and concrete plinths. It is estimated that a 450 mm pipeline with a water flow rate of 540 m³/hour will be required.

2.1 CONSTRUCTION OF THE WATER SUPPLY PIPELINE

As stipulated in the Eskom study entitled 'Works Information for Water Supply during KWS Outage' this alternative is described as having two sections, namely:

- The Komati Reservoir to WTP emergency pipeline (point 1 to 3 in **Figure 2-1**); and
- The WTP Emergency pipeline (point 3 to 5 in **Figure 2-1**).



Figure 2-1: Proposed Pipeline Route

Reservoir to WTP emergency pipeline

Figure 4 shows the required reconfiguration of the new pipeline. This new pipeline will run below ground parallel to the existing ash pipelines until the existing emergency line (point 1 to point 3). The line will be connected to the existing connection point of the emergency line, at point 3. A reconfiguration of the reservoir pipework, at point 1 will be done to provide isolation of the Komati reservoir compartment. The existing 400 mm drain valve will be used for a connection point to the new 450 mm HDPE pipe. The valve 00VA12S501 (Figure 2-2) will be closed to isolate the station's main supply lines and then opened for Vaal water to be directed to the south cooling water system.

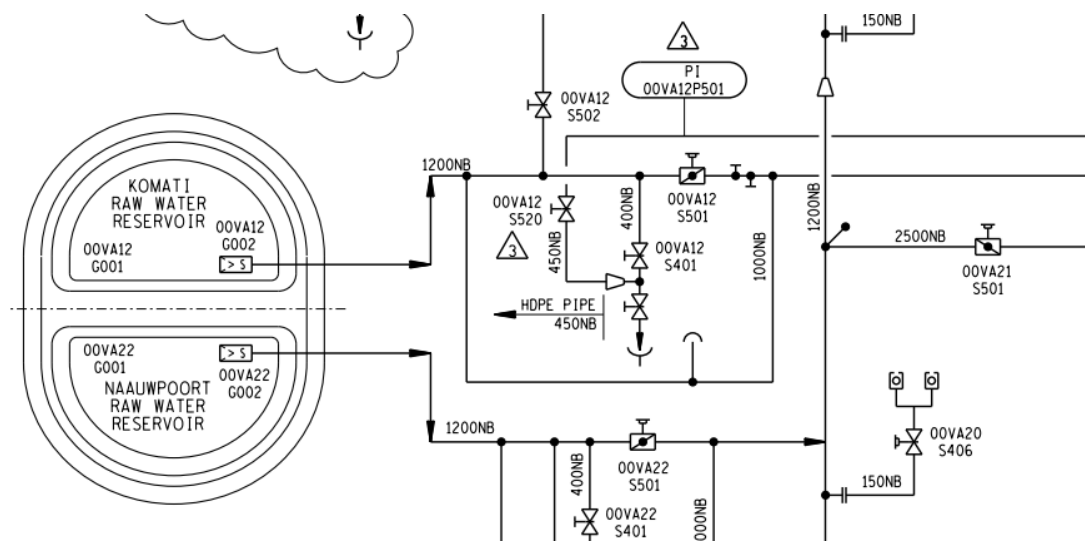


Figure 2-2: Interconnecting Valve

WTP Emergency pipeline

The 450mm line will be connected to the existing connection point of the existing emergency line which will then be decommissioned and removed completely. A new 450mm reservoir connection pipeline will be installed in place of the old 200mm emergency line from point 3 to the WTP (point 5). The pipeline between point 3 and 4 will be below ground, while above ground between point 4 and 5.

Figure 2-3 provides the schematic diagram of the pipeline.

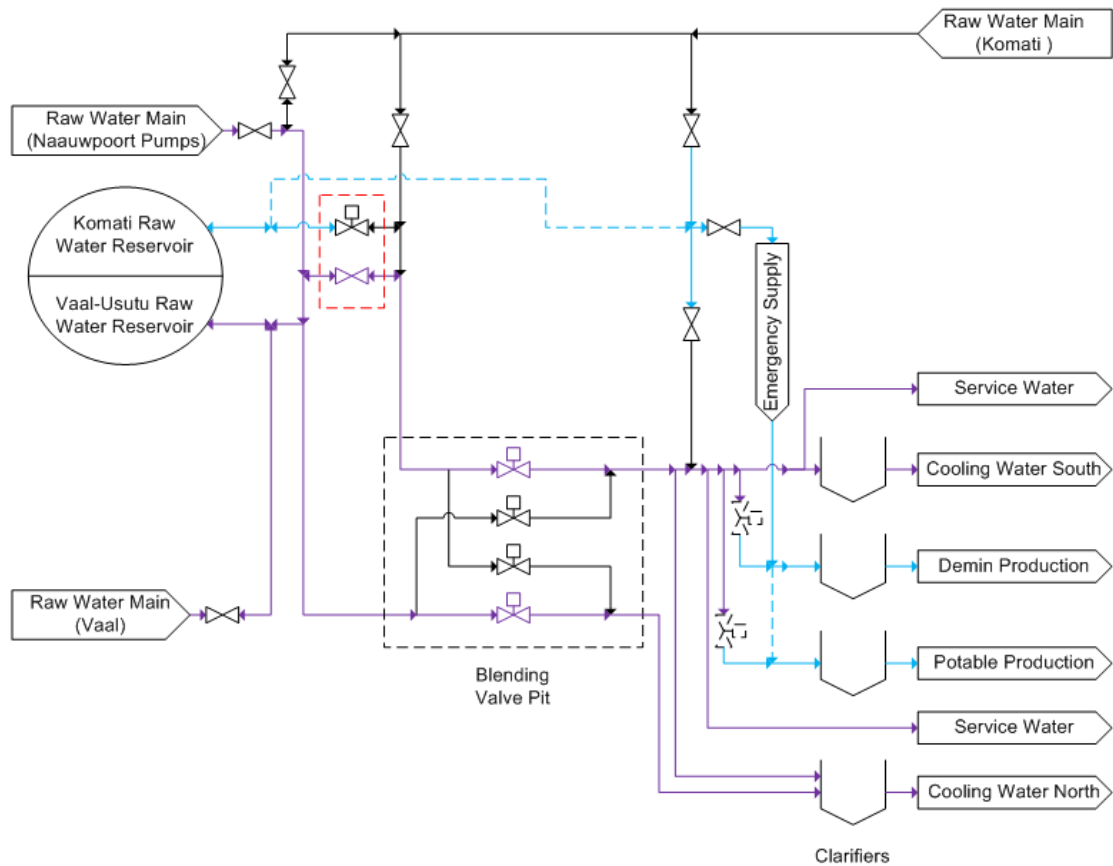


Figure 2-3: Schematic Diagram of the proposed pipeline

The total length of the proposed pipeline is 2.285km.

Currently the emergency line is supported on concrete sleeper supports and once in the station it is supported on a steel support that is mounted on a short brick wall or short steel stub column as shown in the **Figure 2-4**.



Figure 2-4: Steel Pipe Supports

These supports require refurbishment as at various spots the steel saddle has broken off and the pipes are seated on the ground unsupported as can be seen in **the Figure 2-5**.



Figure 2-5: Current State of the Pipe Supports on Site

The envisaged sequence of construction for Alternative 1 is the following:

1. The HDPE pipe is laid from the Komati Raw Water Reservoir to the WTP valve pit A and supports installed.
2. The Emergency Supply line is removed as the new pipe is installed.
3. The HDPE pipe is connected to the Emergency line tie in valve.
4. The HDPE pipe is connected to the drain valve at the Komati raw water reservoir.

5. Drain valve opened and the HDPE pipe is filled with water.
6. Manual valve configurations are completed and the system is running.

All existing supports will need to be refurbished and modified to accommodate the new pipe size. The new routing will require the pipe line to pass through the station perimeter fence which will be achieved by routing the pipe line through an existing pipe culvert that runs under the security fence that is used for the ash lines.

2.2 SERVICES

2.2.1 Water for construction purposes

Approximately 100 m³ of water will be required during the construction phase. The water required will be delivered to the project area using tanker trucks, which will obtain from the Duvha Water Treatment Plant

2.2.2 Power

All machinery used during the construction will be diesel/petrol driven.

2.2.3 Sanitation

Chemical ablution facilities will be made available to the construction staff at all times during the construction period. These facilities will be serviced regularly, and the waste will be transported to a treatment facility off-site. The facilities will be removed from the site once the construction phase is completed.

2.2.4 Contractors Camp and Laydown Area

The contractor's camp and laydown areas shall be located outside the identified artificial wetland and drainage areas.

2.2.5 Access Roads

The existing access roads will be used throughout the construction period.

2.3 MATERIALS HANDLING

2.3.1 Stockpiles of Raw Materials

The stockpiles will be placed in such a way that they will not impact on any wetlands and drainage areas. It is anticipated that the Contractor will make use of a local supplier of ready mix concrete and that it will not be necessary to store material such as cement, sand and stone for the mixing of concrete on site.

2.3.2 Fuel Display

To prevent earthmoving machinery moving in and out of the site and disrupting traffic in the area diesel will be stored on site. Diesel will be required primarily for the earth moving equipment. The demand for diesel is estimated at 10 000 litres per month. On-site storage of about 5 000 litres in above ground storage tanks will be required to ensure the continuation of the construction activities.

2.3.3 Construction Materials

- **Bulk earthworks:**

Suitable excavated material from the trench will be stockpiled adjacent to the excavated area and used as backfill after the pipe has been laid. Material not suitable for backfilling and all excess excavated material that is not required for backfilling will be disposed of at the Middelburg Landfill Site.

- **Pipeline:**

Pipes will be sourced and delivered from one of the main pipeline suppliers, and will be laid and welded together on site.

2.4 EMPLOYMENT

It is anticipated that the contractor who will be appointed to do the work will be responsible for recruiting people, including those from the surrounding area. Employment will only be generated during the construction phase of the project.

2.4.1 Occupational Health and Safety

As a basis, all contractor employees and visitors will undergo induction training with regard to health, safety and the environment. This training will be required prior to entering the site for the first time and will be required each time the conditions on-site change such that additional training is required.

Personal Protective Equipment (PPE) will be issued by all persons entering the construction site. PPE includes safety shoes, goggles, earplugs, gloves, hard hats, masks, etc. The PPE required will be dependent on the area that the person is working in, as well as the activity he/she is undertaking.

2.5 PROJECT TIMING

The implementation of the project is subject to obtaining an Environmental Authorisation (EA) from the Department of Environmental Affairs (DEA). The construction has been scheduled to commence in March 2017.

3. ROLES; RESPONSIBILITY AND COMPLIANCE MONITORING REQUIREMENTS

The purpose of this section is to define roles for personnel and allocate responsibilities in the implementation and monitoring of the EMPr. The reporting relationships and an indication of the institutional linkages on the project are set out in **Figure 3-1**.

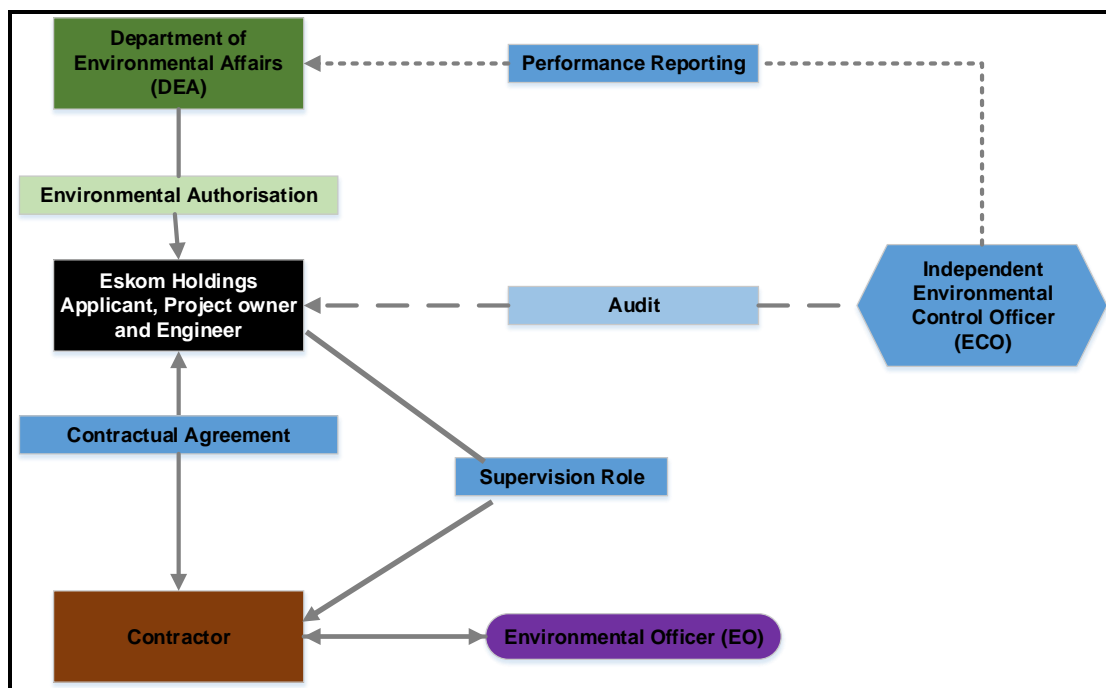


Figure 3-1: Institutional Arrangements

3.1 DEPARTMENT OF ENVIRONMENTAL AFFAIRS (DEA)

The DEA, on behalf of the Minister, plays a lead role in the implementation of national environmental policies, legislation and regulations. Their role is to ensure that the the construction of the water supply pipeline at Duvha Power Station is implemented in a sustainable manner, in compliance with the relevant environmental legislation. DEA is responsible for approving the EMPr for the project and any revisions and amendments thereto.

3.2 ESKOM HOLDINGS SOC LTD

Eskom Holdings SOC Ltd is the applicant, the developer of the project and the Client of the Contractor and Environmental Control Officer (ECO). Under the South African environmental law, applicants are accountable for the potential impacts of activities being undertaken as well as managing these impacts. Eskom, therefore, has the overall environmental responsibility to ensure that the implementation of the EMPr complies with national and provincial legislation as well as with the conditions of the

Environmental Authorisation (EA) and will designate one of its Environmental personnel to monitor the project

Eskom may delegate environmental compliance / responsibility to nominated agents such as the Contractor and ECO.

3.3 CONTRACTOR

The Contractor is responsible for the implementation of this EMPr and conditions of the EA and must ensure works on site are conducted in an environmentally sensitive manner and fully in accordance with the requirements of the EMPr, at all times. The appointed ECO will work closely with the contractor to ensure that the EMPr and EA are adhered to at all times.

3.4 ENVIRONMENTAL CONTROL OFFICER (ECO)

Eskom will appoint a suitably qualified ECO who will be responsible for monitoring and auditing the implementation of the EMPr and EA during the construction and decommissioning phases. The designation of the ECO is reserved for a suitably qualified environmental personnel, with adequate environmental knowledge to understand and implement the EMPr. Once appointed, the name and contact details of the ECO must be submitted to the Director: Compliance Monitoring of the DEA.

The duties of the ECO during construction phase will include but are not limited to:

- Evaluation of the EIA documents and verify the environmental condition of the project footprint.
- Prior to the commencement of construction activities the ECO and Contractor will conduct a pre-construction survey of site. The findings of the pre-construction survey must be documented in a report with photographic reference by the Contractor for the ECO's review. The construction procedure, designated no go areas and activity zones must also be confirmed at this time by the Contractor and Eskom and agreed with by the ECO.
- Bi-weekly (i.e. every two weeks) site inspections during construction must take place to ensure adherence to environmental laws and the conditions contained in the EA and EMPr.
- Monthly reports and relevant checklists on the findings of the monitoring sessions must be compiled and submitted to Eskom.
- Provide independent compliance reporting to the DEA.

- Conduct monthly audits and compile report on audit findings for submission to Eskom and the DEA.
- Reporting of any non-conformances within 48 hours of identification of such non-conformance to the relevant authorities.
- Ensure that the requisite remedial action is implemented in the event of noncompliance.
- Maintain a non-conformance register.
- Ensure the proactive and effective implementation and management of environmental protection measures.
- Ensure that a register of public complaints is maintained by the Contractor and that any and all public comments or issues are appropriately reported and addressed.
- Act as a Liaison between Eskom, the Contractor and DEA.

3.5 CONTRACTOR MANAGEMENT

Contractor management will be affected through specific activities as listed below:

- At the tender briefing meeting environmental management expectations during the project shall be highlighted.
- The EA and EMPr shall be included with the contract documents.
- Once the Contractor is appointed they should be instructed to develop a document that should indicate how they plan to ensure compliance with the EMPr; and
- Fines and penalties shall be managed in accordance with Eskom procedures.

3.6 INCIDENTS AND NON-CONFORMANCES

According to Section 30 of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA): *“Incident” means an unexpected sudden occurrence including a major emission, fire or explosion leading to serious danger to the public or potential serious pollution of or detriment to the environment, whether immediate or delayed.*

In terms of the above definition:

The Emergency response plan/method statement should be initiated in response to an incident as classified in **Table 3-1**. The incident must be reported to the ECO and DEA as per Section 30 (3) of NEMA. An emergency incident report required in terms of Section 30(5) of NEMA must be submitted to DEA’s Environmental Management Inspectorate for processing.

A chemical spill is defined as a potential liquid hydrocarbon or chemical spill or other release which can create a hazard to life or property or create environmental damage. Examples include liquid hydrocarbons, compressor or other equipment lube oil, evaporative cooler acid water, liquid odorant, or other substances that contain controlled or hazardous substances. Spills and other environmental incidents have been classified according to the risk to the environment and appropriate responses are indicated in **Table 3-1**.

Table 3-1: Classification of Environmental Incident

Level	Definition	Response Required
Level 1	A Minor Emergency which can be controlled entirely by the personnel and facilities located within the immediate vicinity of the accident/incident site. These include events which cause minor property or equipment damage that are non-disruptive to operations, and do not pose a safety risk to personnel or property outside of the boundaries of the development footprint.	Record in the incidents register and managed accordingly
Level 2	A Level 2 Incident is defined as a Moderate Emergency which is disruptive, but not extensive, and forces <u>a portion</u> of the employer operation to be temporarily suspended or shut down. A Level 2 Incident is a spill or hazardous product release which has the potential to cause harm to personnel, the public, or the environment and includes a chemical spill of more than 35 l to land; or any chemical spill to water resources.	Record in the incidents register and managed accordingly
Level 3 to 5 Incidents	A Level 3 to 5 Incident is defined as a Serious (3), Major (4) to Catastrophic (5) alert requiring the intervention of external support services and that can have serious impacts on ecology, humans and on the overall Project.	Report the incident to the ECO immediately. The ECO will submit an emergency incident report to DEA. The incident must also be recorded in the incidents register

In the above cases, it will be the decision of the site management as to whether work stoppage must be implemented. In most cases, work in the area where the incident

occurred will be stopped until all safety clearances have been given. Unless, there is a fatal accident, then the whole site will stop.

The holder of the authorisation must notify DEA, in writing and within 48 (forty eight) hours, if any condition of the EA cannot be or is not adhered to. The notification must be accompanied by reasons for the non-compliance. Non-compliance with a condition of the EA may result in criminal prosecution or other actions provided for in NEMA and the 2014 EIA Regulations.

3.7 PENALTIES AND FINES

A penalties and fines system shall be developed and implemented as per Eskom's procedure.

4. ENVIRONMENTAL PRINCIPLES AND LEGAL REQUIREMENTS

4.1 ENVIRONMENTAL PRINCIPLES

The following environmental principles should be considered at all times during the pre-construction and the construction phase:

- The footprint of the construction activities must be kept as small as possible,
- As a minimum requirement, all relevant standards relating to international, national, provincial and local legislation will be adhered to,
- In addition to the international, national, provincial and local legislation, Eskom's policies and procedures shall be adhered to; and
- Every effort will be made to implement the waste hierarchy of reduce, reuse, and or recycle waste material generated on site.

4.2 COMPLIANCE WITH LEGISLATION AND REGULATION

The contractor is required to comply with all relevant legislation and regulations.

4.2.1 Required environmental permits, licences and authorisations

Waste disposal – All hazardous waste generated during the construction phase on site will only be disposed of to an appropriate licensed landfill site in terms of the National Environmental Management: Waste Act 2008 (Act 59 of 2008) (NEMWA). Copies of the permits or licences of the landfill sites to be used must be obtained and kept on site before the commencement of construction.

All general and hazardous waste generated on site shall be separated and disposed of at the permitted waste disposal site in such a manner as not to cause any nuisance conditions or secondary pollution.

Storage of hazardous substances – Hazardous substances must be stored and handled in accordance with the appropriate legislation and standards. This may include the Hazardous Substances Act 1993 (Act 85 of 1993) (HAS), the Occupational Health and Safety Act 1993 (Act 85 of 1993) (OHSA), relevant associated Regulations and applicable SANS standards. The Contractor must ensure that all the relevant Material Safety Data Sheets (MSDS) are present on site at all times.

Alien Invasive Species – The removal of the alien and weed species encountered on the construction area must take place in order to comply with existing legislation

(amendments to the regulations under the Conservation of Agricultural Resources Act, 1983 (CARA) and Section 28 of the NEMA.

Health and Safety – The necessary health and safety measures shall be implemented as required in terms of the OHSA.

Heritage Resources – The National Heritage Resources Act 1999 (Act 25 of 1999) (NHRA) requires permits for the removal of structures or elements of cultural significance on site. The Heritage Resources study found that there are no heritage resources in the project area.

Water Use licence (WUL) – Prior to construction taking place in any water courses authorisation is required from the Department of Water and Sanitation (DWS). This may be in the form of a directive or in the form of a Water Use Licence (WUL). The current project will not affect any water courses and wetlands (i.e. no construction activities will be conducted within 100 m of a water course or within 500 m of any wetland) and will therefore not require a WUL in terms of the National Water Act, 1998 (Act 36 of 1998) (NWA).

5. ENVIRONMENTAL MANAGEMENT PROGRAMME FOR THE CONSTRUCTION PHASE

Objectives were set as part of the EMPr to ensure that the EMPr is measurable. The following management plans have been identified:

- **Section 5.1:** Site Establishment and Construction layout management and mitigation plan.
- **Section 5.2:** Material Sourcing and Earthworks.
- **Section 5.3:** Noise Control Management and Mitigation Plan.
- **Section 5.4:** Dust Abatement and Mitigation Plan.
- **Section 5.5:** Waste Management and Mitigation Plan.
- **Section 5.6:** Emergency Preparedness Plan.
- **Section 5.5:** Soil Protection and Erosion Management and Mitigation Plan.
- **Section 5.8:** Water Management and Mitigation Plan.
- **Section 5.9:** Traffic and Transportation Management and Mitigation Plan.
- **Section 5.10:** Flora, Fauna and Avifauna Management and Mitigation Plan.
- **Section 5.11:** Socio-economic Management and Mitigation Plan.
- **Section 5.12:** Heritage Management and Mitigation Plan.
- **Section 5.13:** Site Rehabilitation.

Other general mitigation and management measures are included in **Chapter 15**.

5.1 SITE ESTABLISHMENT AND CONSTRUCTION LAYDOWN AREA

This management and mitigation plan defines the establishment and management of the general site and the construction laydown area to prevent or minimise environmental impacts these might cause.

The plan is made up of the following components:

- Site Clearance;
- Site offices;
- Ablution facilities;
- Eating areas;
- Environmental Awareness;
- Hazardous materials handling and storage;
- Gates and Fences

5.1.1 Site Clearance

Objective

Limit extent of areas cleared for construction purposes and to contain all activities within the development foot print.

Target

- To minimise impacts associated with the establishment of the construction camp and laydown area.
- Compliance with SANS standards for site clearance (SANS 2001-BS1:2008) or Eskom Bush Clearing procedure.

Management and mitigation requirements

- a) Site clearance shall occur in a planned manner.
- b) No areas falling outside of the approved footprint may be cleared for construction purposes.
- c) Adhere to SANS standards (SANS 2001-BS1:2008) or Eskom Bush Clearing procedure for site clearance.

5.1.2 Ablution facilities

Objective

To ensure that ablution facilities that comply with norms and standards are provided.

Targets

- Sufficient ablution facilities supplied for the workforce;
- Ablution facilities are kept clean and in good working order;

Management and mitigation requirements

- a) An adequate number (as per the requirements of the OHS Act at a preferred ratio of 1 toilet per 15 workers, but not less than 1 toilet per 30 workers) of portable toilets at the various work areas and site establishment area, including provision for security and access control personnel.
- b) Toilets should not be located further than 200 m from the place of work.
- c) The Contractor shall make provision to have the toilets cleaned and maintained in a hygienic fashion and shall supply toilet paper.
- d) Toilets must be secured to the ground to ensure they are not blown over during high winds or bumped over.
- e) The Contractor shall also make available provisions for workers to wash their hands after using the toilets.
- f) Where portable toilets are located within view of the public or neighbouring residences or places of business, efforts should be taken to screen such facilities from view.
- g) The Contractor shall ensure that no spillage occurs when the toilets are cleaned or emptied and that the contents are properly stored and removed from Site.
- h) Discharge of waste from toilets into the environment and burial of waste is strictly prohibited and must be treated at a registered waste water treatment works.
- i) Portable toilets shall be placed and maintained in such a way as to prevent the potential pollution of the ground and surface water resources.
- j) The contractor shall keep record, and provided such records upon request from the ECO, of the location and volumes of waste disposed.
- k) The use of pit latrines and soak-a-ways is prohibited.
- l) Washing, whether of the person or of personal effects and acts of excretion and urination are strictly prohibited other than at the facilities provided.
- m) The Contractor shall take disciplinary action and implement penalties against any staff member found in contravention of this requirement.

5.1.3 Eating Areas

Objective

To ensure that there is a designated eating area that is protected from the elements (rain, wind, sun) and has adequate seating to accommodate the staff.

Target

- The workforce involved in the project are well informed and utilise the designated eating area.

Management and mitigation requirements

- a) The Contractor must ensure that a designated eating area within the construction laydown area is provided.
- b) The eating area must provide protection from the elements (rain, wind, sun).
- c) The eating areas should also be located away from construction noise, dust, waste storage areas, hazardous materials stores, fuel storage and dispensing areas and any other activity that may contaminate food or impair comfort.
- d) The eating areas shall provide adequate seating to accommodate the staff.
- e) An adequate number of rubbish bins shall be provided to contain the waste generated and emptied daily or as required.
- f) The eating areas shall make provision for a smoking area, including seating and a fire proof sand filled container for extinguishing cigarettes. Smoking shall otherwise be prohibited across the site and in the work areas.
- g) The eating area must be kept clean and tidy.

5.1.4 Environmental Awareness

Objective

All personnel involved in the project (including sub-contractors, visitors, inspectors, casual workers, etc.) should be aware of and familiar with the environmental requirements for the project.

Target

- To ensure that conditions of the EA and EMPr that are relative to the day to day activities on site are included in the Safety Induction,
- All personnel undergo a safety and environmental induction before commencing with any activities on site;

Management and mitigation requirements

- a) The Contractor has the responsibility to provide the site foremen and site engineers etc. with environmental training and to ensure that he/she is capable of passing the information to all the construction staff. Training of the construction staff shall include:
- How construction activities can impact on the environment and what can be done to mitigate such activities;
 - Construction staff shall be made aware of the appearance of possible archaeological or historical objects look and to notify the EO and ECO if such an object is found;
 - Management and minimising of waste;
 - Spill prevention and clean-up procedures;
 - Responsible handling of chemicals and spills;
 - Emergency procedures and incident reporting;
 - Making staff aware of the risk and dangers in regular tool box talks; and
 - Code of Conduct.
- b) The ECO will monitor the performance of the construction staff to ensure that the points that were relayed during their training and induction have been understood and are being followed. If required, a translator may be requested to explain aspects of the environmental requirements or acceptable social behaviour that are unclear.
- c) The Contractor will ensure that construction staff are aware of the following rules:
- Eskom lifesaving rules;
 - No firearms allowed on site;
 - Pets are not allowed on site;
 - Firewood may not be harvested from the site or from adjacent areas;
 - Trespassing on neighbouring properties is forbidden;
 - Fines shall be implemented for transgressions.
- d) Environmental awareness must be created through the use of signage, posters, and regular tool box talks.
- e) Create awareness of water conservation in environmental awareness training, such as toolbox talks, posters and through other available media;
- f) Highlight simple water savings tips such as keeping taps properly closed, fixing leaks on hosepipes and others;
- g) Include observations of unnecessary water use during site inspections;
- h) Where possible, recycle water on the construction site; and

- i) Dust suppression must be done in such a way to prevent pooling of water and runoff leaving the construction site.

5.1.5 Hazardous Material handling and storage

Objective

To ensure that hazardous materials handling and storage is effective and compliant with national, provincial and local regulatory requirements.

Target

- Ensure 100 % compliance to national, provincial, and local regulatory requirements.

Management and mitigation requirements

Hazardous materials include diesel, petroleum, oil, bituminous products, cement, solvent-based paints, lubricants, explosives, drilling fluids, pesticides, herbicides and Liquid Petroleum Gas. Material Safety Data Sheets (MSDSs) shall be available on site for all hazardous substances used on site.

- a) Ensure that all personnel (storeman) that use, handle and store hazardous materials are trained in the following:
 - In the use and potential dangers of materials;
 - Emergency response procedures;
 - The handling and storage practices, for all containers with which they will come into contact;
 - PPE requirements;
- b) An area for the storage of hazardous materials must be established that conforms to the relevant safety requirements and that provides for spillage prevention and containment, the following minimum requirements must be implemented:
 - All hazardous substances must be stored in a designated area that is ventilated, surrounded by an impermeable cement bund and provided with a hard, impervious surface as well as sufficient roof cover to prevent the ingress of water;
 - Where applicable or as advised by the ECO all banded areas will be provided with a catchment sump that drains to a separator unit and prevents runoff from entering and contaminating any adjacent areas;

- Bund walls must be impervious and of sufficient height to contain at least 110% of the volume of any materials stored within the bunded area, in order to ensure that any spillages can be contained and reclaimed without causing any pollution;
 - All hazardous materials storage area must be locked and access restricted to authorised personnel and must be clearly marked as such;
 - All relevant safety signage must be erected outside the hazardous storage area;
 - Firefighting equipment must be placed within range of the hazardous storage facility;
 - All hazardous material containers must be clearly labelled;
 - Storage of incompatible materials (acids, bases, flammables, oxidizer reactive chemicals) into separate areas and with containment facilities separating materials;
 - Store acetylene, propane and oxygen cylinders in dedicated areas where they will be protected from collision or ignition sources.
- c) The following conditions must be implemented when storing, handling and dispensing of fuel:
- All earthmoving vehicles and equipment shall be on a preventative maintenance schedule to ensure that the equipment is in a good working order to prevent the leakages of oil and diesel;
 - An inspection programme shall be implemented to ensure that all the mechanical equipment is inspected on a daily basis to ensure the optimal functioning of the equipment;
 - Vehicle maintenance areas shall be located outside the 1:100 year flood line. The areas shall be isolated from any clean stormwater systems. Drainage from these area will pass through an oil separator before it is discharged to the stormwater;
 - Oil removed from the oil separators shall be stored in suitable containers for recycling. An approved service provider shall be used to remove the used oil from site;
 - Refuelling of equipment shall occur in designated areas by trained people;
 - Fuel amounts to be stored shall on any given day be kept below 80 cubic meters in order not to trigger a listed activity in terms of the EIA regulations 2014;

- Bund areas shall be provided for bulk storage of diesel, fuel, and oils which shall contain 110% of the volumes stored;
- Spill kits shall be readily available to clean up spillages;
- Drivers and operators shall be trained to use spill kits and contain spillages to the smallest possible areas and the training records shall be made available on request;
- Contaminated soil shall be removed and disposed of to an appropriate licensed landfill site in terms of NEMWA, or can be removed by a service provider that is qualified to clean the soil;
- No field maintenance of equipment shall be permitted;
- Drip trays shall be used when dispensing fuel or oils from the earthmoving equipment outside any demarcated areas for any other reason;
- Drip trays shall only be emptied into a dedicated container;
- Dedicated containers must be emptied into containers for removal by an approved contractor to be recycled; and
- Waste manifests and safe disposal certificates must be filed as proof of safe disposal of any hydrocarbons removed from site.

5.2 MATERIAL SOURCING AND EARTHWORKS

To ensure that materials are sourced from authorised operations and that potential impacts from stockpiled material on the environment are limited.

The plan is made up of the following components:

- a) Material Sourcing;
- b) Earthworks and Stockpiles.

5.2.1 Material Sourcing

Objectives

To ensure that materials used for construction are from authorised operations.

Targets

- A 100% record of the sources of all materials.

Management and mitigation requirements

- a) The Contractor will prepare a source statement to indicate the sources of all materials and submit these to Eskom for approval.

5.2.2 Earthworks and Stockpiles

Objectives

To ensure that material stockpiled does not negatively impact on the surrounding environment and that topsoil is suitably stored for subsequent use in the rehabilitation and re-vegetation of the site.

Targets

- Stockpiles are constructed and maintained appropriately.
- To ensure conservation of top soil for the rehabilitation of the site.

Management and mitigation requirements

- a) Prior to site establishment and any earthmoving operations, the Contractor will strip and stockpile all topsoil within the footprint of the construction activities.
- b) The following shall apply for the stripping, stockpiling and storage of topsoil:
 - Soil shall be stripped in a phased manner, so as to retain vegetation cover for as long as possible to avoid prolonged exposure of soils to wind and water erosion;

- All topsoil shall be stockpiled separately from spoil material;
 - No imported topsoil will be used as the final backfill layer; and
 - Stockpiles shall be convex and shall not exceed 2 metres in height.
- c) All stockpiles will be positioned and sloped to create the least visual impact.
- d) All stockpiles will not be allowed underneath trees or against the trunks of trees.
- e) All stockpiles will be constructed and maintained to avoid erosion of the material and contamination of the surrounding environment (including measures such as berms and hessian sheets to prevent erosion and sedimentation).
- f) No stock piling of any material shall take place within 100 m of a watercourse owing to high sedimentation.
- g) Stockpiles should be located as far away as possible from sensitive receptors.
- h) Weed control must be administered on all stockpiles.
- i) If the stockpiles start to erode significantly or cause dust problems, they shall be covered with hessian mats. This is to be determined by the ECO.
- j) Vehicles transporting spoil material must be covered before leaving site.

5.3 NOISE CONTROL MANAGEMENT AND MITIGATION PLAN

There are several general noise mitigating measures/principles which must be applied during the construction phase in order to prevent/minimise impacts on the identified noise sensitive areas. These requirements apply to all of the construction areas of the project.

Objective

To minimise noise levels.

Target

- To ensure noisy operations are restricted to day time hours.
- To ensure compliance with requirements of the Occupational Health and Safety Act (Act No 85 of 1993).

Management and mitigation requirements

- a) In terms of noise impact, the National Noise Regulations define an increase of 7 dB as disturbing. Noise levels must be kept within 7 dB, where possible.
- b) Construction activities are to be contained to working hours during the day.
- c) Deliveries of material and any noisy offloading activities should be restricted to daytime.

- d) As construction workers operate in a very noisy environment, it must be ensured that their working conditions comply with the requirements of the Occupational Health and Safety Act (OHSA) (Act No 85 of 1993). Where necessary ear protection gear should be worn.
- e) No amplified music shall be allowed on site. The use of radios, tape recorders, compact disc players, television sets etc. shall not be permitted unless the volume is kept sufficiently low as to avoid any intrusion on members of the public within range. Sound amplification equipment is not to be used unless in emergency situations.
- f) All equipment shall be kept in good working order with immediate attention being paid to slipping fan belts, worn bearings and other sources of anomalous noise.
- g) Equipment shall be operated within specifications and capacity (e.g. no overloading of machines).
- h) Regular maintenance of equipment will be undertaken particularly with regards to lubrication.
- i) Equipment shall be operated with appropriate noise abatement accessories such as sound hoods which must be correctly maintained.
- j) Equipment shall be turned off when not in use.
- k) Residents from Speekfontein and at Duvha Park in close proximity to the development site should be notified 24 hours prior to any planned activities that will be unusually noisy.

5.4 DUST ABATEMENT AND MITIGATION PLAN

To maintain the emissions of dust particulates and exhaust fumes to a minimum to minimize health hazards and nuisance to workers and persons in adjacent areas and preventing damage to natural vegetation and crops.

Objective

To minimise dust emissions from the construction sites.

Target

- No complaints received regarding dust nuisance.

Management and mitigation requirements

- a) Vehicles travelling along the access roads must adhere to speed limits to avoid creating dust.

- b) A maximum speed limit of 40 km/hr must be adhered to on all site roads.
- c) Dust abatement measures must be implemented.
- d) Visual dust monitoring must be undertaken by the Eskom EO and ECO, and dust abatement measures implemented immediately should excessive dust releases be noticed.
- e) Where dust is unavoidable, screening may be required.
- f) Dust suppression measures such as irrigation with water shall be implemented.
- g) The Contractor must submit an *air quality (dust) management* method statement that must include but is not limited to the following:
 - Identification of high dust generation activities;
 - Techniques proposed for controlling dust. These may include water spraying and/or application of dust suppressants;
 - If water spraying is the chosen method of dust control adequate provision must be made for designated water trucks for the sole purpose of administering dust suppression (i.e. these are not to be used for production purposes). The method statement must detail the route/area that each water truck is designated for and how regularly dust suppression in these areas will be undertaken.
 - If the use of dust suppressants is the chosen method of dust control, the drivers of the truck must be adequately trained in mixing and applying this measure on routes/areas. The method statement must detail mixture requirements and route/area that each water truck is designated for and how regularly dust suppression in these areas will be undertaken.

5.5 WASTE MANAGEMENT AND MITIGATION PLAN

The inappropriate handling and disposal of waste materials can impact on both human safety and risk contamination of the natural environment. This management and mitigation plan covers the handling and disposal of solid waste, including domestic, construction, and hazardous waste as well as waste water/contaminated water and old shutter oil, generated during construction.

The waste management principles of prevent, minimise, recycle or re-use, with disposal as a last option will apply. Only permitted/licensed, registered and municipal landfills will be considered as options for disposal of waste. The Contractor must compile a Waste Management Method Statement with minimum requirements:

- Classification/identification of waste streams as described but not limited to the sections that follow;
- Designate waste disposal facilities (bins, skips etc.) for each waste stream;
- Designate individuals responsible for waste management on site and train accordingly;
- Identify where and how to dispose of difference waste streams;
- Record keeping and maintaining waste manifest and safe disposal certificates to account for all waste removed off site for safe disposal.

The plan is made up of the following components:

- Domestic waste;
- Inert waste;
- Hazardous waste; and
- Handling and disposal of contaminated waste water.

5.5.1 Domestic waste

Objective

To ensure that all domestic waste generated during construction is disposed of at a licensed municipal waste disposal facility.

Target

- Reduced the amount of waste produced.
- Re-use of material where possible.
- Recycle the material where possible.
- Disposal as the last resort.

Management and mitigation requirements

- a) Ensure segregation of hazardous wastes from non-hazardous waste.
- b) Segregation of waste must be maximised so that reuse and recycling are not compromised.
- c) Utilise lidded bins and/or covered skips to prevent windblown waste into neighbouring properties and limit rodent, pests and bad odours.
- d) Maintain Waste manifests for all waste streams and safe disposal certificates/waybills.

- e) Disposal of all waste must be done at a licensed disposal facility in accordance with all applicable legislation, and in such a manner as not to cause any nuisance or secondary pollution.
- f) The Contractor shall make available the time and resources needed to undertake routine housekeeping of the works areas and site establishment areas at a minimum of a weekly interval. Housekeeping shall include:
 - maintenance of barriers;
 - structures;
 - signage;
 - material stockpiles to ensure that they are safe and aesthetically acceptable and to the satisfaction of the ECO;
 - Construction materials shall be stacked in a safe, neat and orderly fashion and shall comply with the requirements of the OHSA; and
 - Windblown litter construction debris and spoil shall be collected and removed for safe disposal.
- g) Littering will not be allowed on site.
- h) Dumping of waste will not be allowed.
- i) The excavation and use of rubbish pits on site is forbidden.
- j) Burning of rubbish is forbidden.

5.5.2 Inert waste

"Inert waste" means waste that:

- does not undergo any significant physical, chemical or biological transformation after disposal;
- does not burn, react physically or chemically biodegrade or otherwise adversely affect any other matter or environment with which it may come into contact; and
- does not impact negatively on the environment, because of its pollutant content and because the toxicity of its leachate is insignificant and which include discarded concrete, bricks, tiles and ceramics, discarded glass and discarded soil, stones and dredging spoil.

Objective

To ensure that inert waste is responsibly disposed of.

Targets

- Responsible reuse and/or disposal of inert material or waste.

Management and mitigation requirements

- a) Construction waste material will be recycled or re-used (e.g. for levelling or as cover material in landfill sites) in the construction process as far as possible;
- b) Regular clearing and disposal of spoil material; and
- c) Where waste is to be transported by truck, it will be covered with a tarp appropriately when travelling through inhabited areas.

5.5.3 Hazardous waste

Objective

To ensure that hazardous waste is treated accordingly or disposed at an appropriate registered waste disposal facility.

Target

- Hazardous waste will always be disposed of at a registered waste disposal facility for toxic/hazardous material.
- In the occurrence where soil contamination is to be treated in situ the Contractor is to provide the ECO and Eskom with a method statement for approval.

Management and mitigation requirements

- a) All hazardous storage containers, storage areas and bund areas for hazardous substances must comply with the relevant SANS standards to prevent leakage;
- b) Bulk storage of hydrocarbons must be stored in a dedicated area and must include a bund or a drain where necessary to contain any spillages during the use, loading and off-loading of the substances;
- c) Bunded areas shall contain 110% of the stored volume;
- d) Bund areas must be impermeable;
- e) Bund areas must have a facility such as a valve/sump to drain or remove clean stormwater;
- f) Regular inspections shall be carried out to ensure the integrity of the bund walls;
- g) The relevant safety signage must be provided to warn employees of the hazards in the area;
- h) Used oil, lubricants, and cleaning materials from the maintenance of vehicles and machinery shall be collected in a holding tank and stored as hazardous materials before being sent back to the supplier or recycled by a reputable registered/permitted company;

- i) An oil/water separator must be installed to collect run-off from designated wash bays and designated fuel areas (if provided on site by the contractor). Oils collected in this manner will be retained in a safe holding tank and removed from site by a specialist oil recycling company for disposal at approved waste disposal sites for toxic/hazardous materials;
- j) Used spill material and filter materials shall be temporarily stored in a designated hazardous waste bin/skip for safe disposal off site to a licensed disposal facility to receive such waste;
- k) Oil contaminated soil must be remedied in-situ for minor incidents and ex-situ for moderate to major incidents dispose safely to a licensed hazardous disposal ;
- l) In the occurrence where soil contamination is to be treated in situ, the Contractor is to provide the ECO and Eskom with a method statement for approval.
- m) Hazardous waste should only be disposed of in a licensed hazardous waste site;
- n) Empty cement bags are considered hazardous waste and must be disposed of accordingly; and
- o) Certificates of safe disposal must be provided for every load and must include the date and vehicle registration number.

5.5.4 Handling and disposal of contaminated waste water

Objective

To ensure the handling and disposal of contaminated water is done within the framework of applicable acts and regulations.

Targets

- No discharge of polluting elements to any Storm water drain and surrounding environment.
- A 100% compliance to relevant standards.

Management and mitigation requirements

- a) No discharge of pollutants such as cement, concrete, lime, chemicals, fuels, or oils will be allowed into any water resource and surrounding environment;
- b) Grey water from kitchens, showers, and/or sinks shall be discharged in accordance with NEMWA Regulations and DWS General Discharge Standards;
- c) Runoff from fuel areas, workshop areas, wash bays, and concrete swills shall be treated as hazardous liquid waste in accordance with the NEMWA Norms and Standards;

- d) Wash areas shall be placed and constructed in such a manner so as to ensure that no pollution occurs, including groundwater pollution; and
- e) Contaminated water must be stored in accordance with NEMWA Norms and Standards and be removed by tanker to a licensed facility.

5.6 EMERGENCY PREPAREDNESS PLAN

In the case of an incident as described in **Section 3** of this EMPr, the Emergency preparedness plan will ensure that impacts are limited/and or addressed accordingly. Emergency preparedness and response plan must be compiled and detail the following:

- A telephone contact list of personnel responsible for emergency prevention and response, (the relevant Eskom representative, and local emergency services).
- A list and description of the types of emergencies that may arise on site.
- Site evacuation procedures and emergency assembly point (drills to be conducted).
- Procedures to be followed in the event of an incident.
- Safeguard measures to prevent fire, with special reference to hazardous materials, fuels and lubricants and explosives stores.
- A layout plan showing the following:
 - The location and type of firefighting equipment;
 - Emergency assembly point;
 - Evacuation routes.

The Emergency Preparedness Plan must encompass a Spill Management Plan and a Fire Management Plan as follows:

5.6.1 Spill Management Plan

Objective

To prevent spills on site.

Target

- In the event of a spill, quick and effective remedial action must be taken to ensure little or no significant impact.
- Should a spill occur the correct reporting procedure is to be implemented.

Management and mitigation requirements

- a) In the event of a hydrocarbon spill, the source of the spillage shall be isolated, and the spillage contained. The contaminated area must be unearthed to the point of infiltration. If in-situ treatment and rehabilitation of soil is to be administered **Section 5.5** of this EMPr will apply.
- b) All contaminated soil and materials must be treated as hazardous waste and disposed of at a licensed facility to receive such waste, except in the case where in situ soil treatment will occur.
- c) The contractor is required to submit a method statement on spill prevention and detail how spills will be managed. The minimum requirements include:
 - Spill prevention measures, such as drip trays, need to be made available on site and proper use communicated to the workforce;
 - All Spills must be reported to the EO for immediate remedial action;
 - All employees must be aware of the emergency procedure(s) to be followed in order to deal with spills and leaks;
 - Reporting procedure must be communicated as per **Section 3** of this EMPr;
 - The Contractor shall ensure that the necessary materials and equipment for dealing with spills and leaks is available on Site at all times;
 - The quantity of such materials shall be able to handle a minimum of 200 ℓ;
 - Treatment and remediation of the spill areas shall be undertaken to the reasonable satisfaction of the ECO/EO.

5.6.2 Fire Management Plan

Objective

To prevent fires on site.

Target

- In the event of a fire, quick and effective remedial action must be taken to eliminate the fire.
- Should a fire occur the correct reporting procedure is to be implemented.

Management and Mitigation

- a) Controlled fires maybe permitted on site in designated areas for recreational purposes.
- b) A designated smoking area within the camp laydown area must be provided with a fire proof sand filled container for extinguishing cigarettes. Smoking shall otherwise be prohibited across the site and in the works areas.

- c) Employees must be aware of the procedure to be followed in the event of a fire.
- d) Fire drills must be conducted every six months or as otherwise required by the OHSA.
- e) Adequate fire protection measures and firefighting equipment must be available at each work area and the camp laydown area to deal with the type and nature of fire that may arise.
- f) The Contractor shall prepare a Fire Prevention and Fire Emergency Method Statement. The Method Statement should include, but not limited to the following:
 - Fire Fighting training for designated site staff;
 - Sources of fire risk;
 - Measures to comply with any requirements of local authority fire departments;
 - Measures to minimise the risk of accidental fires;
 - Measures to control accidental fires.

5.7 SOIL PROTECTION AND EROSION MANAGEMENT AND MITIGATION PLAN

Excessive erosion can lead to land degradation and the reduction of the area's carrying capacity. It is important to implement an erosion management plan and also conserve the soil potential.

The plan is made up of the following components:

- Soil Erosion migration measures;
- Groundwater and Soil Contamination mitigation measures.

5.7.1 Soil Erosion Mitigation Measures

Objective

To conserve soil potential.

Target

- To prevent soil erosion.

Management and Mitigation

- a) Vegetation shall be stripped in a phased manner as the work proceeds so as to reduce the time that stripped areas are exposed to the elements.
- b) Top-soiling and re-vegetation shall start immediately after completion of the works.
- c) Only existing access roads will be utilised to gain access to site.
- d) Storm water control shall be undertaken to prevent soil loss from the site.

- e) All embankments shall be protected by a cut off drain to prevent water from running down the face of the embankment, resulting in soil erosion.
- f) Areas around internal roads and stockpiles shall be visually monitored during site inspections.
- g) A photographic record of the on-site conditions shall be kept by the ECO to aid in the identification of erosion problems.
- h) Signs of rill and gully erosion shall be remediated immediately, erosion berms should be installed to prevent gully formation and siltation of the wetland resources: The following points should serve to guide the placement of erosion berms:
 - Where the track has a slope of less than 2%, berms every 50m should be installed;
 - Where the track slopes between 2% and 10%, berms every 25m should be installed;
 - Where the track slopes between 10%-15%, berms every 20m should be installed; and
 - Where the track has a slope greater than 15%, berms every 10m should be installed.
- i) Typical remediation techniques also include:
 - silt fences;
 - hay bales;
 - Eco-Logs and
 - Jute mats.

5.7.2 Groundwater and soil contamination mitigation measures

Objective

To preserve soil and groundwater resources.

Target

- To ensure no contamination of soil and groundwater resources.

Management and Mitigation

- a) Mixing / decanting of all chemicals and hazardous materials takes place on a drip tray or impermeable surface.
- b) Ensure all hazardous storage tanks/drums/stores are designed and managed in order to prevent pollution of stormwater, groundwater and soils.

- c) No batching/mixing of cement shall occur directly on unprotected ground.
- d) Empty cement bags shall be stored for safe disposal of site in weatherproof containers to prevent windblown cement dust or be affected by rain or runoff events.
- e) The Contractor shall take all reasonable measures to prevent the spillage of cement/ concrete during batching and construction operations. During pouring, the soil surface shall be protected using plastic and all visible remains of concrete shall be physically removed on completion of the cement/ concrete pour and appropriately disposed of. All spoiled and excess aggregate/ cement/ concrete shall be removed and disposed of via the solid waste management system.
- f) Where “ready-mix” concrete is used, the Contractor shall ensure that the delivery vehicles do not wash their chutes directly onto the ground.
- g) Any spillage resulting from the “ready-mix” delivery shall be immediately cleared and disposed of via the solid waste management system. Ready-mix trucks shall not be permitted to dump drum wash on site unless into a designated contaminated water pond which is properly lined with impermeable materials and which must be fully rehabilitated at completion.

5.8 WATER MANAGEMENT AND MITIGATION PLAN

Construction activities inherently have the potential to impact on the water environment, specifically surface water. This management and mitigation plan ensures that construction activities are managed in such a manner that any negative impacts are mitigated or prevented.

The plan is made up of the following components:

- General;
- Storm water management;
- Water Abstraction;
- Pollution Control and discharge measures;
- Water conservation and recycling;
- Wetland Preservation.

5.8.1 General

The Contractor shall submit a Water Management Method Statement (WMMS), including measures for water conservation, for approval by Eskom and ECO, prior to the commencement of works.

The WMMS must include monitoring and reporting mechanisms that cover all water abstractions from any water sources, waste discharge, soil erosion and water quality aspects.

The WMMS must include measures to prevent the pollution of water course with grease, hydrocarbons, suspended solids or other contaminants emanating from construction activities. These measures shall include a site plan approved by Eskom.

The WMMS should include an indication of how water and wastewater/effluent will be managed at/with respect to (i) camps and associated facilities, (ii) excavations, (iii) pumping operations, (iv) cleaning and washing bays, (v) site drainage (silt and erosion control), and (vi) storm water.

5.8.2 Storm Water Management

Objectives

To ensure that Storm water runoff and discharge are effectively controlled.

Targets

- No flooding of the construction sites as a result of storm water control measures.
- No erosion as a result of storm water control measures.
- No silt pollution as a result of storm water control measures.

Management and mitigation requirements

- a) Storm water drainage lines must be constructed by the Contractor to divert runoff water around the construction site to prevent contamination of the water and ponding.
- b) Vehicle maintenance areas shall be located outside drainage lines. The areas shall be isolated from any clean storm water systems. Drainage from these areas will pass through an oil separator before it is discharged to the storm water.
- c) The soil must be stabilized in order to prevent wash downs into any water resource.
- d) All storm water drainage lines shall contain water flow arrestors to prevent erosive action on the sides of the drainage lines.
- e) The sediment and erosion control measures should remain in place until construction is complete. The above noted sediment traps would require regular monitoring during construction and reinstatement as necessary.

- f) Road drainage to deflect storm water off the road surface will be required. This can be achieved effectively by constructing drainage deflection humps diagonally across the road surface.
- g) Any waste water and/or storm water that is discharged during the construction phase will have to comply with the requirements of the National Water Act, specifically with the conditions set by the General Standard (Regulation 9225, Government Gazette, 18 May 1984) unless a licence is issued that sets specific standards for selected variables.
- h) Any erosion channels which develop during the construction period must be suitably backfilled, compacted and restored to a proper condition (i.e. vegetated etc.).

5.8.3 Water abstraction

Objectives

Water abstraction will not be permitted unless authorisation is granted by DWS.

Targets

- Obtain all necessary authorisations in terms of Section 21 of the National Water Act (No.36 of 1998).

Management and mitigation requirements

- a) Any abstraction of water for construction purposes must be approved by DWS.

5.8.4 Pollution control and discharge measures

Objectives

To ensure no pollution of any river, stream and / or wetland with grease hydrocarbons and suspended solids.

Targets

- Implement measures to prevent pollution (solid wastes, oil spills, discharge of sewage).

Management and mitigation requirements

- a) Storage, handling and disposal of fuels, oils, lubricants and other potentially harmful chemicals (and their containers) will be undertaken as per **Section 5.1.5** of this EMPr.

- b) Discharges of liquid waste will not be allowed.
- c) Any spillages of pollutants, irrespective of size, shall be contained and cleaned immediately as per established spill procedures.
- d) The Contractor shall implement measures to prevent, reduce and mitigate water contamination, including prevention of contamination by suspended sediments.
- e) The Contractor shall prevent discharge of any pollutants, such as cements, concrete, lime, chemicals and fuels into any water sources/course.
- f) Run-off from fuel storage areas / workshops / vehicle washing areas must be directed into an oil separator for safe disposal as described in **Section 5.5.3**.
- g) Disposal of any waste water that is discharged during the construction phase will have to comply with the requirements of the National Water Act, specifically with the conditions set by the General Standard (Regulation 9225, Government Gazette, 18 May 1984) unless a licence is issued that sets specific standards for selected variables.

5.8.5 Water conservation and recycling

Objective

To minimise water use and maintain sustainability.

Targets

- To ensure regular maintenance of all pipes and taps.

Management and mitigation requirements

- a) The Contractor will take all practical measures to minimise water use on site and will immediately attend to any wastage. This will include but not limited to:
 - monitoring of pressure pipes for leaks,
 - closing taps when not in use,
 - efficient use of water for washing of plant, recycling water as much as possible;
 - The quantity of water used for construction purposes must be monitored.
- b) Water derived from or generated through construction related activities that becomes contaminated must be treated to ensure compliance with National Water Act, specifically with the conditions set by the General Standard (Regulation 9225, Government Gazette, 18 May 1984) before being released back into the environment.
- c) The Contractor shall re-use or recycle as much of this water as possible.

5.8.6 Wetland preservation

Objective

The artificial wetland in the development will not be affected by construction activities.

Targets

- No impact on riparian vegetation.
- No impact on wetland vegetation.
- No silt pollution into the wetland as a result of construction activities.

Management and mitigation requirements

- a) Limit the footprint area of the construction activities within site boundaries.
- b) Construction vehicles must use existing roads and internal roads to access site.
- c) During construction all building materials should be kept out of the wetland area.
- d) Keep all demarcated sensitive zones outside of the construction area off limits during the construction and rehabilitation phases of the development.
- e) Appropriate sanitary facilities must be provided during the construction phase and all waste removed to an appropriate licensed waste facility.
- f) Limit vegetation clearance to the absolute minimum to avoid increased silt loads and runoff velocities and volumes which may affect the hydrology of downstream wetland areas.
- g) In the event of a breakdown, spill prevention measures must be implemented to prevent ingress of hydrocarbons
- h) All vehicles must be regularly inspected for leaks.
- i) It must be ensured that all hazardous storage containers and storage areas comply with the relevant SANS standards to prevent leakage.
- j) Re-fuelling must take place on an impervious area to prevent ingress of hydrocarbons.
- k) All spills must be immediately removed to the point on infiltration. Contaminated soil must be disposed of at a licenced Hazardous waste disposal facility.
- l) Proliferation of alien and invasive species is expected within any disturbed areas. These species should be eradicated and controlled to prevent their spread beyond the development footprint.
- m) Removal of the alien and weed species encountered on the property must take place in order to comply with existing legislation National Environmental Management: Biodiversity Act 2004 (Act No 10 of 2004) Alien and Invasive Species Regulations, 2014.

- n) Care should be taken with the choice of herbicide to ensure that no additional impact and loss of indigenous plant species occurs due to the herbicide used.
- o) Implement soil erosion prevention and control measures.
- p) Monitor all systems for erosion and incision.
- q) Upon rehabilitation, reseedling of indigenous grasses should be implemented in all impacted areas and strategic planting of grassland species should take place.
- r) As much vegetation growth as possible should be promoted to protect soils. In this regard special mention is made of the need to use indigenous vegetation species where hydro-seeding, wetland and rehabilitation planting (where applicable) are to be implemented.

5.9 TRAFFIC AND TRANSPORTATION MANAGEMENT AND MITIGATION PLAN

Construction activities inherently have the potential to impact on traffic flow and patterns. Compliance to the road safety measures and recommendations would minimise disruptions and negative impacts to traffic flow and patterns.

The plan is made up of the following components:

- Construction signage.
- Traffic movement of construction vehicles.

5.9.1 Construction signage

Objective

The objective is to warn the general public of construction traffic, and to manage traffic on site.

Target

- To ensure road safety along the public roads and on-site and to increase awareness of slow moving vehicles.

Management and mitigation requirements

- a) Where existing public roads are used to access the construction areas, adequate construction signage is in place to inform the public of increased construction activities in the affected areas by placing adequate signage.
- b) Traffic signs should warn community road users of the presence of construction vehicles.

5.9.2 Traffic movement of construction vehicles

Objective

Ensuring road safety for regular road users and construction vehicles.

Targets

- Regulation of construction traffic to minimise the impact on regular road users.
- Regulation of normal road traffic to minimise impact of construction activities on these road users and to ensure a safe passageway for both these road users as well as normal road users.

Management and mitigation requirements

- a) All vehicle drivers entering the construction camp must pass a Breathalyzer test.
- b) Random drug testing may be undertaken on site.
- c) The maximum speed limit for all vehicles on site shall be 40 km / hour.
- d) All parking must be reverse parking, where possible.
- e) Construction vehicles must only make use of approved demarcated roads in order to limit the ecological footprint of the proposed development activities, avoid encroaching into the wetland areas or their respective buffer zones and reduce the possibility of collisions.

5.10 FLORA, FAUNA AND AVIFAUNA MANAGEMENT AND MITIGATION PLAN

Construction activities inherently have the potential to impact on the environment, specifically flora and fauna. This management and mitigation plan ensures that construction activities are managed in such a manner that any negative impacts are mitigated or prevented.

The following components are included in the Flora, Fauna and Avifauna management plan

- Protection of ecologically sensitive areas/ habitats and endangered flora, fauna and avifauna;
- Weeds and alien vegetation;
- Flora, Avifauna and Flora rescue and relocation.

5.10.1 Protection of ecologically sensitive areas/habitats and endangered fauna and flora

Objective

To minimise fragmentation of habitat for flora, fauna and avifauna

Targets

- Maintenance of vegetation in its natural condition.
- Prevent unnecessary removal of vegetation.
- Ensure as little disruption to fauna and avifauna as possible.

Management and mitigation requirements

- a) All activities must be contained within the pipeline footprint to minimise disturbance outside these areas.
- b) No activities are to infringe upon wetlands and associated 32 m buffer zone.
- c) All wetland areas must be designated as No-Go areas and be off limits to all unauthorised vehicles and personnel.
- d) Vehicles must be restricted to travelling on designated roads to limit the ecological footprint of the proposed activity.
- e) Removal of the alien and weed species encountered on the property must take place in order to comply with existing legislation National Environmental Management: Biodiversity Act 2004 (Act No 10 of 2004) (NEMBA). Alien and Invasive Species Regulations, 2014.
- f) Care should be taken with the choice of herbicide to ensure that no additional impact and loss of indigenous plant species occurs due to the herbicide used.
- g) A pollution control system/spill handling procedure must be implemented to limit impact of such occurrences and prevent discharge to the receiving environment.
- h) No trapping or hunting of fauna and avifauna is to take place;
- i) Edge effects of all construction activities, such as erosion and alien plant species proliferation which may affect floral habitat, need to be strictly managed.

5.10.2 Weeds and alien vegetation

Objective

To minimise invasion of alien plants in the areas affected by construction.

Targets

- Ensure that proliferation of Alien invasive does not occur

Management and mitigation requirements

- a) Removal of the alien and weed species encountered on the property must take place in order to comply with existing legislation NEMBA and Alien and Invasive Species Regulations, 2014.
- b) An alien vegetation control plan must be compiled by the Contractor and implemented within areas associated with the project, the following minimum requirements must be implemented:
 - Weed control must be administered every three months;
 - Classify weeds to determine the eradication measures to be implemented;
 - Appropriate PPE (gloves) should be used when removing weeds;
 - Weeds must be uprooted, bagged and disposed of. The correct disposal procedure is to be determined in consultation with the ECO.
- c) Care should be taken with the choice of herbicide to ensure that no additional impact and loss of indigenous plant species occurs due to the herbicide used.
- d) Removal of species should take place throughout the construction and operational phases.

5.10.3 Terrestrial Biodiversity

Objective

To minimise loss of Species of Conservation Concern (SCC).

Target

- No impacts on SCC.

Management and Mitigation Requirement

5.10.4 Flora

- a) The Contractor shall be on the lookout for SCC and any floral SCC encountered within the development footprint, are to be relocated to areas with suitable habitat outside the construction footprint. This specifically relates to *B. disticha* (**Figure 5-1**) which was encountered during the ecological surveys. **Figure 5-2** shows areas where the SCC were encountered;



Figure 5-1: *Boophane disticha* observed on site, within the transformed habitat unit.



Figure 5-2: Sections of the project area where SCC were encountered

- b) Other species with a high probability of occurring in the study area include *Crinum bulbispermum* which is most likely to occur around the artificial wetland and *Hypoxis hemerocallidea* which will most likely occur throughout the study area. Floral species of conservation concern, if encountered within the development footprint, are to be handled with care and the relocation to suitable similar habitat shall be overseen by a botanist;
- c) The proposed development footprint shall be kept to the minimum;
- d) All disturbed areas must be concurrently rehabilitated during construction;
- e) Prohibit the collection of any plant material for firewood or medicinal purposes;
- f) The existing integrity of flora surrounding the study area shall be upheld and no activities shall be carried out outside the footprint of the construction areas;
- g) Edge effect control shall be implemented to avoid further habitat degradation outside of the proposed footprint area;
- h) All sensitive open space areas will be demarcated and access into these areas shall be prohibited;
- i) Maintenance related activities shall be kept strictly within the development footprint;
- j) Maintenance vehicles shall only be allowed on designated roadways to limit the ecological footprint of the project; and

5.10.5 Fauna

- a) The proposed development footprint areas shall remain as small as possible and where possible be confined to already disturbed areas;
- b) No trapping or hunting of fauna shall be permitted;
- c) Edge effects of all construction and operational activities, such as erosion and alien plant species proliferation which may affect faunal habitat shall be strictly managed; and
- d) No informal fires in the vicinity of construction areas shall be permitted.

5.10.6 Invasive alien vegetation

- a) Edge effects of activities including erosion and alien/ weed control will be strictly managed;
- b) All sites disturbed by construction activities shall be monitored for colonisation by exotic or invasive plants;
- c) Exotic or invasive plants shall be controlled as they emerge;
- d) The eradicated plant material must be disposed of at an approved solid waste disposal site;

- e) Priority species shall be identified to control and develop protocols for the removal of all alien species e.g. mechanical removal, herbicidal treatment etc. Mechanical methods must be favoured to chemical methods where possible for the removal of alien invasive species. Chemical removal shall only be undertaken by a suitably qualified and approved person; and
- f) As much vegetation growth as possible must be promoted in order to protect soils. In this regard, special mention is made of the need to use indigenous vegetation species where rehabilitation planting is to be implemented.

5.11 SOCIO-ECONOMIC MANAGEMENT PLAN

Construction activities have the potential to impact on the social environment to a fairly large extent. This social management and mitigation plan ensures that construction activities are managed in such a manner that the positive impacts may be enhanced and the negative impacts are minimised as far as possible.

The plan consists of the following components:

- Maximise new business sales, multiplier effects & economic stimulation.
- Maximise employment and skills transfer.
- Minimise in-migration and effect of temporary worker on social dynamic and pressure on socio-economic infrastructure and services.
- Minimise safety and security impacts.
- Minimise nuisance, noise, and other disruptions and change in quality of living environment.
- Minimise visual land use patterns alteration and change in sense of place and other spatial considerations.

5.11.1 Maximise new business sales, multiplier effects and economic stimulation

Objective

Maximise new business sales, local economic multiplier effect, and economic stimulation during the construction phase

Targets

- Local procurement policy is adopted
- Local goods and services are purchased from local suppliers where available and feasible

Management and mitigation requirements

- a) Ensure that the appropriate procurement policies are put in place and monitored.
- b) Eskom should seek to develop a database of local companies, specifically Broad Based Black Economic Empowerment (BBBEE) companies, which qualify as potential service providers (e.g. Construction companies, security etc.) Prior to the commencement of the tender process for construction contractors. These companies should be notified of the tender process and invited to bid for project-related work;
- c) Procurement policies should promote the use of local business, where applicable.
- d) Investigate the possibility of procurement of construction materials, goods and products from local suppliers where available/feasible, in order to source as much goods and services as possible from the local area.
- e) Any contravention of the procurement policies must be swiftly, transparently and appropriately be dealt with.

5.11.2 Maximum Employment and Skills transfer

Objective

Manage the impact that the influx of job seekers might have on composition and functioning of the local community, with particular concern for the impact that these job seekers might have on the local residents' sense of safety and security.

Targets

- Establish an employment strategy that is known and communicated to potential job seekers.
- Eskom should aim to employ as many unskilled, low-skilled and semi-skilled workers from the local area as possible so that labour intensiveness is maximised. This should be a requirement for all contractors and sub-contractors.
- Opportunities for training of workers should be maximised.
- Prevent loitering and the construction of informal dwellings in the vicinity of the construction camp and sites.
- No construction personnel accommodation will be allowed on site.

Management and mitigation requirements

- a) Draw up a recruitment policy in conjunction with Councillors of the area and ensure compliance with this policy.

- b) The recruitment policy and employment procedures must be communicated to local stakeholders and potential job seekers. The policy must include but not limited to the following:
- Provide communication channels and mechanisms through which local communities and construction workers can address their expectations and concerns and where the limitations of opportunities created by the project are highlighted through Ward Councillors.
 - Women are to be given equal employment opportunities and encouraged to apply for positions.
 - A skills transfer plan should be put in place at an early stage and workers should be provided the opportunity to develop their skills which they can use to secure jobs elsewhere post-construction.
- c) No on site staff accommodation is allowed. Accommodation for construction workers must be in existing lodging facilities.

5.11.3 Minimise in-migration and effect of temporary workers on social dynamics and pressure on socio-economic infrastructure and services

Objective

Avoid or reduce the potential pressure on socio-economic infrastructure/services and potential social conflicts on family structures and social networks associated with the presence of in migration of temporary non-local workforce during the construction phase.

Targets

- To maximise use of local workforce.
- To avoid/minimise the potential increased pressure on local infrastructure and services.
- To avoid/minimise the potential impact on communities social dynamics.

Management and mitigation requirements

- a) Where possible, make it a requirement for contractors to implement a 'locals first' policy for construction jobs, specifically for unskilled and low-skilled job categories. Include 75% target in tender documents. Employment criteria should be communicated to the community in advance (e.g. in newspapers, community forum notice boards, etc.).

- b) The contractor must keep a record of local (and non-local) recruitment which needs to be reported to Eskom.
- c) Accommodation for non-local members of the workforce, should as far as practically possible be arranged so that unskilled labourers are not left to their own device in which case non-local labourers are likely to accommodate themselves in the small community of Rietkuil.
- d) Ensure that all workers are informed at the outset of the construction phase of the conditions contained on the Code of Conduct.
- e) Ensure that workers found guilty of breaching the Code of Conduct are dismissed or dealt with in accordance with labour legislation.
- f) The Contractor should make necessary arrangements to enable workers from outside the area to return home over weekends and or on a regular basis during the construction phase. This would reduce the risk posed by non-local construction workers to local family structures and social networks.

5.11.4 Minimise Health, safety and security impacts

Objective

Avoid or reduce the possible increase in crime and safety and security issues as well as avoid or decrease the possible decline in health issues during the construction phase.

Targets

- To maximise use of local workforce.
- Aim for 75% of unskilled and low-skilled workforce to be sourced from the local area.
- To avoid/minimise the potential impact on health, safety and security on local communities.

Management and mitigation requirements

- a) Appoint as many locally unemployed unskilled or low-skilled labourers from Rietkuil and surrounds to lessen the risk of unacceptable social behaviour and to minimise the potential for criminal activity or perceived perception of an increase in criminal activity due to the presence of an outside workforce and influx of people.
- b) Screening prior to hiring should be undertaken, and proper monitoring procedures should be adhered to, to minimise the risk of crime and violent behaviour.

- c) Fence off the construction area to avoid unauthorised access. Access control and a method of identification of site personnel are required at all times. Security lighting should be implemented.
- d) Ensure that security personnel are on site on a permanent basis.
- e) Working hours should be kept between 7am and 5pm as to be agreed with surrounding landowners and occupiers.
- f) Local community organisations, adjacent land owners, policing forums / neighbourhood watches must be informed of construction times and the duration of the construction phase. Liaise with existing forums to communicate information to the community and to assist in the monitoring of compliance.
- g) Ensure that open fires on the site for heating, smoking or cooking are not allowed except in designated areas.
- h) Provide adequate firefighting equipment on site and provide firefighting training to selected construction staff.
- i) A comprehensive employee induction programme should be developed to cover land access protocols, road safety, etc.
- j) All vehicles must be road worthy and drivers must be qualified and made aware of the potential road safety issues and follow the speed limits.
- k) Adequate signage along the access roads within the Power station needs to be provided to warn motorists of the construction activities taking place.
- l) Ensure that proper safety gear is administered and safety precautions are taken.
- m) Design, implement and enforce an appropriate Safety, Health and Environment programme and code of conduct (with strict control measures) that includes the use of Personal Protective Equipment to ensure the well-being of workers.
- n) Ensure that construction workers are clearly identifiable. All workers should carry identification cards and wear identifiable clothing.
- o) Put procedures and regulations in place to control loitering and the construction of informal dwellings in the vicinity of the construction camp and sites.

5.11.5 Minimise nuisance noise and other disruptions and change in quality of living environment

Objective

To minimise the potential impacts of nuisance, noise and other disruptions and to minimise the change in quality of the living environment during the construction phase

Targets

- To maximise use of local workforce.
- To avoid/minimise the potential impact on health, safety and security on local communities.

Management and mitigation requirements

- a) Residents in close proximity (5 km) to the development site should be notified 24 hours prior to any planned activities that will be unusually noisy. This communication can take the form of an SMS/ telephone call/email.
- b) Construction related activities should be limited between Monday and Saturday (daylight hours).
- c) Movement of abnormal loads, if required, should be timed to avoid times of the year when traffic volumes are likely to be higher, such as start and end of school holidays, peak hours, long weekends and weekends in general, etc.
- d) Ensure that damage caused by construction is repaired.
- e) Implement dust suppression measures.
- f) Ensure all vehicles are road worthy, drivers are qualified, made aware of the potential noise and dust issues, and adhere to speed limits.

5.11.6 Minimise impacts on Duvha Primary School

Objective

To avoid/minimise the potential impacts of nuisance, noise, dust, visual disturbance, safety of students and quality of life during the construction phase.

Targets

- No complaints from Duvha Primary School regarding the construction activities.

Management and mitigation requirements

- a) Dust and noise generation should be minimised as much as possible through implementing dust and noise suppression measures.
- b) Traffic calming measures, such as reducing speed limits, should be put in place to deter any unnecessary through-traffic through the surrounding residential areas.
- c) Ensure all vehicles are road worthy, drivers are qualified, made aware of the potential noise and dust issues and adhere to speed limits.
- d) Safety at and around the site should be ensured by limiting any fire risks, fencing off the site to avoid unauthorised access and employing permanent security personnel.

- e) Establish a code of conduct to increase public safety for the site and surrounds which has a focussed section on ensuring safety for scholars/teachers, etc.

5.11.7 Complaints management

Objectives

- To establish and maintain a system of records which provide full documentation of complaints and how all complaints received are effectively addressed.
- To timeously inform affected parties of disruptive activities.

Targets

- Establish processes and procedures to effectively address all complaints received.
- All complaints will be acknowledged within 24 hours of receipt.
- Respond effectively to all complaints received within 48 hours, unless additional information and/or clarification is required.

Management and mitigation requirements

- a) A formal accessible grievance procedure should be implemented and made available for the communities.
- b) Address all grievances swiftly, in a fair and transparent manner.
- c) Develop a grievance procedure to specifically address gender matters.
- d) The EO shall open and maintain a Complaints Register and an Incidents Register in which all complaints or incidents received from the community must be recorded. The following information must be recorded in the Complaints Register:
 - The name and contact detail of the complainant (if not anonymous);
 - The date, time and nature of the complaint;
 - The response and investigation undertaken;
 - Which actions were taken and who was the person responsible for the action.
- e) The following must be recorded in the Incidents Register:
 - The name of the person/s involved in the incident;
 - The date, time and nature of the incident;
 - The response and reason for the incident;
 - The actions that were taken.
- f) If the construction staff is approached by the community they will be polite and courteous and assist them with locating the relevant personnel who will deal with the complaint.

5.12 HERITAGE MANAGEMENT AND MITIGATION PLAN

Heritage sites are fixed features in the environment, occurring within specific spatial confines. Any impact upon them is permanent and non-reversible. Those resources that cannot be avoided and that are directly impacted by the development can be excavated/ recorded and a management plan can be developed for future action. No heritage resources were found when the Heritage Impact Assessment was conducted. However provision is made on this plan, if per chance finds do occur during excavation and/or other construction activities.

5.12.1 Chance heritage finds

Objective

To ensure heritage sites and graves discovered during construction are addressed in terms of legislation.

Target

- The preservation and appropriate management of new discoveries in accordance with the National Heritage Resources Act (Act No. 25 of 1999) (NHRA) must be conducted, should these be discovered during construction.

Management and mitigation requirements

- a) The Contractors and workers should be notified that archaeological sites and graves might be exposed during the construction work.
- b) Should any heritage artefacts or graves be exposed during excavation, work on the area where the artefacts or remains were discovered, shall cease immediately and the EO and ECO shall be notified as soon as possible.
- c) All discoveries shall be reported immediately to the archaeologist so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the ECO will advise the necessary actions to be taken;
- d) Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or paleontological artefacts, as set out in the NHRA, Section 51. (1).

5.13 SITE REHABILITATION

The aim of site rehabilitation is to successfully restore areas disturbed by construction to their pre-construction state.

The plan consists of the following components:

- Disturbed areas to be rehabilitated.
- Re-vegetation of disturbed areas.
- Rehabilitation and reinstatement of borrow pits, quarries and blasting areas.
- Rehabilitation of wetland and riparian areas.

5.13.1 Disturbed areas to be rehabilitated

Objective

To ensure all areas disturbed during construction are rehabilitated to their natural state/pre-construction condition.

Target

- Achieve acceptable vegetation cover, meaning that not less than 75% of the area grassed or hydro-seeded shall be covered with grass and that no bare patches exceeding 0.25 m² in an area of 1 m x 1 m shall occur. In the case of sodding, acceptable cover shall mean that the entire areas shall be covered with live grass at the end of any period not less than three months after sodding.

Rehabilitation Management Method Statement

Prior to the commencement of Rehabilitation the Contractor shall prepare a Rehabilitation Method Statement for the acceptance of Eskom/EO/ECO, which will include but will not be limited to the following:

- Sites for stockpiling and protection of topsoil recovered from cleared construction areas.
- Soil improvements and fertilisation plan for areas to be rehabilitated.
- Methods for planting grasses from seed, cuttings and sods.
- Sources and specifications for compost, manure and mulching material.
- Detail Method for preparing areas for rehabilitation, and for planting grass from seeds, from cuttings, by hydro-seeding and by sodding.
- Maintenance of the rehabilitated areas during the establishment period and up to the handover period.
- Plant and equipment to be used for the rehabilitation of disturbed areas.

Management and mitigation requirements

The Rehabilitation Plan and Method Statement will include, *inter alia*, the following requirements:

- a) Clear the site of all inert waste and rubble, including surplus rock and foundations. After the material has been removed, the site shall be re-instated and rehabilitated.
- b) Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers (or other approved method). If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access.
- c) Re-vegetation must match the vegetation type, which previously existed, unless otherwise indicated by Eskom.
- d) Control invasive plant species and weeds by means of extraction, cutting or other approved methods.
- e) If planting of trees or shrubs are to be undertaken the following will be required:
 - All work to be done by suitably experienced personnel, making use of the appropriate equipment.
 - Planting should preferably be done just before or during the rainy season.
 - Where local soil has poor drainage, broken rock (approximately 75 mm in diameter) must be placed to a depth of 150 mm at the bottom of the planting hole prior to planting trees/shrubs and backfilling with approved plant medium mixture.
 - If impenetrable shale, rock, clay or a high water table is encountered, making the above hole sizes impossible, then seek advice from a qualified professional.
 - Backfill planting holes with excavated material/approved topsoil, thoroughly mixed with weed free manure or compost (per volume about one quarter of the plant hole), one cup of 2:3:2 fertiliser and an approved ant and termite poison.
 - As much of the soil from container plants as possible must be retained around the roots of the plant during planting.
 - The plant must be planted into the specified hole size with the approved soil, compost and fertiliser mix used to refill the plant hole and must cover all the roots and be well firmed down to a level equal to that of the surrounding in situ material.
 - After planting, each plant must be well watered, adding more soil upon settlement if necessary.
 - Add mulch to the surface area of the bermed basin.
 - Where necessary, protect newly planted trees against wind, frost and wild animals by means of fencing, sacking or frost nets.
 - Thoroughly water plants as required until the plants are able to survive independently (i.e. depending on the rainfall).

- f) Topsoil shall be spread evenly over the surface. The final prepared surface shall not be smooth, but furrowed to follow the natural contours of the land.
- g) Where sodding is required, light scarification shall be carried out to contain the sods.
- h) Re-vegetated areas showing less coverage than what is defined as acceptable after one growing season shall be prepared and re-vegetated from scratch.
- i) Repair any damage to re-vegetated areas to maintain coverage.
- j) Work areas will be rehabilitated as soon as possible after completion of construction activities in an area, to minimise the potential for erosion and maximise the established time after re-vegetation.
- k) Any runnels or erosion channels that develop during the construction period or during the vegetation establishment period shall be backfilled and compacted, and the areas restored by the Contractor and approved by Eskom.

6. MANAGEMENT AND MITIGATION PLANS FOR OPERATION

The operation phase of the Project will require a very small direct workforce and will be undertaken by existing Eskom staff. Routine maintenance on the pipeline will be undertaken during the operational phase to ensure the integrity of the pipe. Maintenance will need to be carried out throughout the lifetime of the pipeline, estimated at 35 years. Typical activities during maintenance include visual inspection of the pipeline and vegetation control.

6.1 WEEDS AND ALIEN VEGETATION

Objective

To minimise invasion of alien plants within the pipeline footprint.

Targets

- Ensure that proliferation of Alien invasive weeds does not occur

Management and mitigation requirements

- a) Removal of the alien and weed species encountered on the property must take place in order to comply with existing legislation NEMBA and Alien and Invasive Species Regulations, 2014.
- b) An alien vegetation control plan must be compiled by the Operator/Eskom and implemented within the pipeline, the following minimum requirements must be implemented:
 - Weed control must be administered every three months;
 - Classify weeds to determine the eradication measures to be implemented;
 - Appropriate PPE (gloves) should be used when removing weeds;
 - Weeds must be uprooted, bagged and disposed of.
- c) Care should be taken with the choice of herbicide to ensure that no additional impact and loss of indigenous plant species occurs due to the herbicide used.
- d) Removal of species should take place throughout the operational phase.

7. REHABILITATION

The traditional definition of rehabilitation aims at returning the land in a given area to some degree of its former state after a particular process has resulted in its damage.

7.1 REHABILITATION OBJECTIVES

The objectives of the rehabilitation plan will be to:

- Return areas affected by the construction activities to their former state,
- To ensure that any area affected by erosion that occurred as a result of the construction work is rehabilitated, and
- To remove all alien invasive plant species that occur in the disturbed areas.

7.2 REHABILITATION PHASE

Rehabilitation will be done once the construction phase is completed. Where possible rehabilitation activities will be conducted concurrently with the construction phase of the project.

7.2.1 Removal of structures and infrastructure

As soon as the construction work is completed and the construction site or camp vacated, the area must be rehabilitated by appropriate landscaping, levelling, topsoil dressing, land preparation, alien plant eradication and vegetation establishment.

- All construction equipment, storage containers, temporary fencing, temporary services, fixtures and any other temporary works shall be cleared and completely removed from the construction sites,
- Materials that will not be used again must be sold if possible or completely removed, and
- The access roads utilised during construction must be returned to a usable state and/or a state no worse than prior to construction.

7.2.2 Inert waste and rubble

- All inert waste and rubble, including surplus rock shall be cleared and removed from the construction site. After the material has been removed, the site must be re-instated and rehabilitated, and
- All domestic waste shall be removed from the site and disposed of to an approved licensed waste disposal site.

7.2.3 Hazardous waste and pollution control

- All temporary fuel stores, hazardous substance stores, hazardous waste stores and pollution control sumps must be removed from the site. Hazardous waste must be disposed of by a registered contractor to a registered waste site,
- All pollution containment structures must be removed from site. Dispose of materials that will not be used again as hazardous waste, and
- All temporary sanitary infrastructure and waste water disposal systems shall be removed from site. Leaks, overflows and spills must be avoided, and any waste must be disposed of in an appropriate manner.

8. MONITORING PROGRAMME

The monitoring programme contained in this EMPr shall be used to monitor the impacts associated with the project and to ensure that the mitigation measures are effective and sustainable.

8.1 PHOTOGRAPHIC RECORD

Photographic records shall be kept and submitted with the audit reports. The photographic records shall include:

- Dated photographs of the sites to be impacted before construction commences,
- Dated photographs of the sites during construction on a monthly basis, and
- Dated photographs of all the sites after completion of construction seasonally.

8.2 ENVIRONMENTAL MONITORING

The monitoring programme for the project is set out in **Table 8-1**.

Table 8-1: Environmental monitoring programme

Type of monitoring	Parameter	Location	Frequency				Start Date	Comment
			D	W	M	Y		
Soil								
Visual inspection	Soil erosion	Where vegetation is cleared and where topsoil is stockpiled.		X			Throughout construction and rehabilitation	This will continue until rehabilitation is complete and sustainable.
Flora								
Alien invasive species	Declared weeds and alien species	Disturbed areas and rehabilitated areas			X		Throughout construction and rehabilitation	This will continue until rehabilitation is complete and sustainable.
Air quality								
Dust	Visual inspection - Nuisance	Disturbed areas	X				Throughout construction and rehabilitation	
Waste management								
Waste collection and disposal	Maintain a waste manifest book to record volumes of waste leaving the site, including recyclables. Keep safe disposal certificates on file on site for Hazardous waste.	Construction site	X				Throughout construction and rehabilitation	Landfill site permits to be kept on file on site.

Type of monitoring	Parameter	Location	Frequency				Start Date	Comment
			D	W	M	Y		
	Way Bridge slips must be obtained for all other waste streams and kept on file on site							
Storm water management								
Storm water management	Visual monitoring based on sediment	Construction site	X				Throughout construction and rehabilitation	
Rehabilitation								
Visual inspection where areas have been rehabilitated	Basal Cover Aerial Cover Species diversity Proportional of annual: perennial plants present	Rehabilitated areas			X		Throughout rehabilitation	This will be undertaken for a period of three years after construction is completed or until growth is sustainable
Pipeline and Settling Tank								
Visual inspection	Integrity of the pipeline	Along the pipeline				X	Operation phase	Regular inspection will be required.

D – Daily; W – Weekly; M – Monthly, Y - Yearly

9. ENVIRONMENTAL AWARENESS PLAN

The Contractor will be responsible for implementing an environmental awareness training programme to ensure that all the employees are acquainted with the requirements of this EMPr.

As a minimum the contractor will conduct awareness training for all new employees and subcontractors prior to commencement with construction work. All employees must be made aware of what the potential impact can be due to their work activities on the project.

Regular and frequent training which may include daily toolbox talks and safety meetings will be used to provide any additional training as and when required.

Anybody who obtains access to the site for the first time will have to undergo awareness training. This will include any sub -consultants or sub-contractors. A register of all training provided must be kept on site.