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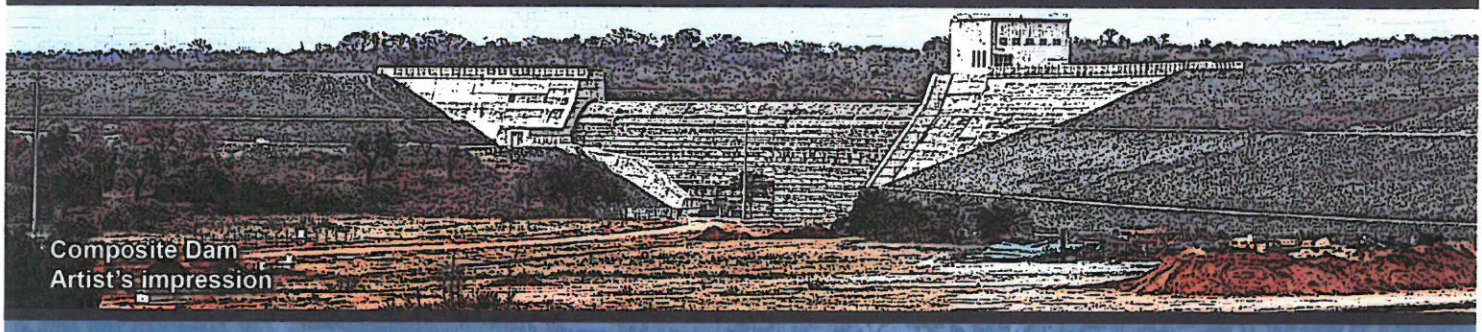
Composite Dam
Artist's impression

Groot Letaba River Water Development Project (GLeWaP)

(DEA Ref No: 12/12/20/978)

ENVIRONMENTAL MANAGEMENT PROGRAMME

Revision 1

March 2014

water affairs
Department:
Water Affairs
REPUBLIC OF SOUTH AFRICA

NWRIB
NATIONAL WATER RESOURCES INFRASTRUCTURE BRANCH

water affairs
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THE GROOT LETABA RIVER WATER DEVELOPMENT PROJECT (GLeWaP)

(DEA Ref No. 12/12/20/978)

ENVIRONMENTAL MANAGEMENT PROGRAMME

Revision 1

March 2014

ILISO consulting

Compiled by: ILISO Consulting (Pty) Ltd

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Project Name	Groot Letaba River Water Development Project	
Report Titel	Environmental Management Programme	
Report prepared for	Department of Water Affairs	
Report prepared by	Revision 0 August 2010	ILISO Consulting (Pty) Ltd: Deon Esterhuizen, Terry Baker and Melissa Naidoo
	Revision 1 March 2014	ILISO Consulting (Pty) Ltd: Terry Calmeyer On behalf of Savannah Environmental

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CONTRACTOR
Accepted by: _____

Name: _____ *Date*

TABLE OF CONTENTS

Page

LIST OF TABLES

APPENDICES

ABBREVIATIONS

CER	Contractor's Environmental Representative
DEA	Department of Environmental Affairs (formerly Department of Environmental Affairs and Tourism and Tourism)
DWA	Department of Water Affairs (formerly Department of Water Affairs and Forestry)
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EER	Engineer's Environmental Representative
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMP	Environmental Management Programme
GLeWaP	Groot Letaba River Water Development Project
GN	Government Notice
MSDS	Material Strategy Data sheets
MAR	Mean Annual Runoff
MPRDA	Mineral Petroleum Resources Development Act (No. 28 of 2002)
NEMA	National Environmental Management Act (No.107 of 1998)
NEMWA	National Environmental Management: Waste Act (Act 59 of 2008) .
OHSA	Occupation Health and Safety Act (Act 85 of 1993)
UIF	Unemployment Insurance Fund

1. INTRODUCTION

This document is an Environmental Management Programme (EMP), for the implementation of the Groot Letaba River Water Development Project (GLeWaP). The EMP is aimed at ensuring that optimal environmental protection is achieved during the pre-construction and construction phases of the project and covers the principles, responsibilities and requirements applicable.

Mitigation measures in the form of environmental management and mitigation plans are specified for purposes of minimising environmental impacts likely to be incurred during pre-construction and construction activities.

The EMP is a dynamic document, which will be reviewed, revised and updated during the life span of the project.

1.1 STRUCTURE OF THE REPORT

The report is structured as follows:

- **Chapter 1** of the EMP serves to outline the background to the project.
- **Chapter 2** provides a project description.
- **Chapter 3** an organisational structure and the roles and responsibilities of the various departments and construction team.
- **Chapter 4** specifies compliance monitoring requirements.
- **Chapter 5** highlights all relevant legislative requirements and principles.
- **Chapter 6** provides the measures applicable to the Pre-construction Phase.
- **Chapter 7** provides mitigation and management plans for the construction phase.
- **Chapter 7.1** Socio-economic management and mitigation plan.
- **Chapter 7.2** Public Consultation and disclosure management and mitigation plan.
- **Chapter 7.3** Construction site management and mitigation plan.
- **Chapter 7.4** Solid Waste management and mitigation plan.
- **Chapter 7.5** Visual Aesthetics management and mitigation plan.
- **Chapter 7.6** Air quality management and mitigation plan.
- **Chapter 7.7** Noise Control management and mitigation plan.
- **Chapter 7.8** Traffic management and mitigation plan.

- **Chapter 7.9** Water management and mitigation plan.
- **Chapter 7.10** Aquatic Ecosystem management and mitigation plan.
- **Chapter 7.11** Material Sourcing and Earthfill Stockpiles management and mitigation plan.
- **Chapter 7.12** Topsoil management and mitigation plan.
- **Chapter 7.13** Spoil management and mitigation plan.
- **Chapter 7.14** Fauna and Flora management and mitigation plan.
- **Chapter 7.15** Heritage management and mitigation plan.
- **Chapter 7.16** Health and Safety management and mitigation plan.
- **Chapter 7.17** Rehabilitation management and mitigation plan.
- **Chapter 7.18** Monitoring requirements.
- **Chapter 7.19** Site Closure requirement

1.2 ENVIRONMENTAL AUTHORISATION

Environmental Authorisation (EA), in terms of Section 24 (5) of the National Environmental Management Act (NEMA), was issues for the GLeWaP on 24 October 2011 and amended on 30 November 2011 (**Appendix A**) based on the Environmental Impact Assessment Report (EIR) prepared by ILISO Consulting (Pty) Ltd in terms of Regulation 32 of Government Notice (GN) 385. The EIR included a draft Construction EMP that complied with Regulation 34 of GN 385.

The EIR included the following recommendations:

- *"Compilation of a compensation and development plan that includes the prioritisation of the land acquisition process in accordance with the established legal procedures to minimise impacts on citrus farmers that require a lead time to re-establish their landuse, and the procedures to deal with the loss of rights of access to water;*
- *Labour procurement to be undertaken through a Labour Desk in accordance with the Department's procedures and policies and gender and race targets to be set and measured as stated in the EMP;*
- *Continued liaison with directly affected landowners and occupiers in the pre-construction and construction phase;*
- *The implementation of general communication strategy for the implementation phase of the project;*

- *Continued liaison with authorities responsible for the implementation of water distribution to ensure that the domestic supply benefits are realised.*
- *Multiple level outlets to be included in the dam design to mitigate downstream water quality impacts;*
- *Fauna and flora plant rescue programmes and a holding nursery to be established;* (Note: A subsequent overview of holding nurseries at post 1994 dams has shown failures throughout for a variety of reasons. This EMP therefore rather requires that protected plants are transplanted to a similar habitat or botanical gardens when rescued.)
- *Confirmation and detailed investigations of archaeological sites to be completed and the required excavation and documentation to be undertaken prior to the impact on the affected sections on the project;*
- *Implementation of a grave relocation programme in accordance with applicable legislation;*
- *Baseline studies should be undertaken to be completed as soon as possible before implementation commences in order to provide a benchmark against which impacts resulting from the construction and operation of the project can be measured. Aspects to be included are social, economic, water quality, aquatic ecology, terrestrial ecology, air quality and noise.*
- *Finalisation and Implementation of the draft Pre-construction Environmental Management Plan (this includes monitoring mechanisms and specifications);*
- *Finalisation of construction and operation EMPs based on the generic EMP (this includes monitoring mechanisms and specifications)."*

Condition 14 of the EA states that "*The Environmental Management Plan (EMP) submitted as part of the application for environmental authorisation must be amended and submitted to the Department for written approval prior to commencement of the activity and it must include measures as dictated by the final dam design. The recommendations and mitigation measures recorded in the EIR dated August 2010 must be incorporated as part of the EMP. Once approved, the EMP must be implemented and adhered to*."

Revision 1 of the EMP (this document) is the amendment of the August 2010 EMP as required in the EA. The implementation of the EA conditions are indicated in **Table 1.1**.

Table 1.1: Conditions in the Environmental Authorisation

Condition in the Environmental Authorisation	Application in the EMP
Condition 10 as amended: "Under no circumstances shall an heritage material be destroyed or removed from the site other than by the SAHRA approved archaeologist who may remove the material for curating or investigation in accordance with SAHRA prescripts"	Section 7.15
Condition 14 as amended: "The Environmental Management Plan (EMP) for construction submitted as part of application for environmental authorisation must be amended and submitted to the Department for written approval prior to commencement of the activity. The recommendations and mitigation measures recorded in the EIR dated August 2010 must be incorporated as part of the EMP in so far as they do not contradict any other legislation. Once approved, the EMP must be implemented and adhered to."	Done.
Condition 15. The applicant must appoint an Independent Environmental Control Officer (ECO) for the construction phase of the development that will have the responsibility to ensure that the mitigation/rehabilitation measures and recommendations referred to in this authorisation are implemented and to ensure compliance with the provisions of the EMP.	Section 3.4
Condition 17. Once appointed, the name and contact details of the ECO must be submitted to the *Director: Compliance Monitoring* of the Department.	Section 3.4
Condition 18. The ECO shall keep record of all activities on site, problems identified, transgressions noted and a task schedule of tasks undertaken by the ECO.	Section 3.4
Condition 20. Records relating to monitoring and auditing	Section 3.3

Condition in the Environmental Authorisation	Application in the EMP
must be kept on site and made available for inspection to any relevant and competent authority in respect of this development.	
Condition 21. All documentation e.g. audit/monitoring/compliance reports and notifications, required to be submitted to the Department in terms of this authorisation, must be submitted to the *Director: Compliance Monitoring* at the Department.	Section 3.4
Condition 22. The holder of the authorisation must submit an environmental audit report upon completion of the construction and rehabilitation activities.	Section 3.2
Condition 23. The environmental audit report must indicate the date of the audit, the name of the auditor and the outcome of the audit in terms of compliance with the environmental authorisation conditions as well as the requirements of the EMP.	Section 3.2
Condition 25 as amended: "The applicant must submit a layout plan for the entire dam basin and associated infrastructure for approval to the Department, indicating information as requested and available as at time of authorisation and amended as further information becomes available to the Department and the layout should indicate: • Foundation footprint; • Permanent lay down area footprint; • Construction period lay down footprint; • Internal roads indicating width (construction period width and operation period width) and numbered sections between the other site elements which they serve (to make commenting on sections possible); • Wetlands, drainage lines, rivers, stream and water crossing of roads and cables indicating the type of bridging structures that will be used; • Heritage sites that will be affected by the new dam and	Section 6.7

Condition in the Environmental Authorisation	Application in the EMP
associated infrastructure; • Borrow pits; • Spoil heaps (temporary for topsoil and subsoil and permanently for excess material); • Buildings including accommodation; • Helipad; and • All "no-go" areas."	
Condition 31 as amended: "Prior to commencement of construction activities, available dam designs and outlet works must be submitted to the Department for record purposes."	Section 6.7 (d)
Condition 32. Standard Protocol Process of shared water must be finalised prior to commencement of the activities and must be submitted to the department for record-keeping.	Section 6.8 (k)
Condition 33 as amended: "Prior to clearance of any area for construction activities, a thorough quadrant search of the footprint must be undertaken during the flowering season to search for the known RDL floral species listed in terrestrial ecology specialist study in support of the EIR, in order to rescue affected species. Individual can be translocated to the outside of the footprint or removed to a suitable botanical garden for cultivation and protection. This should only be done after consultation with provincial conservation authorities."	Section 6.3 (a)
Condition 34. A permit must be obtained from the relevant nature conservation agency for the removal or destruction of indigenous protected and endangered plant and animal species.	Section 5.2
Condition 35 as amended: Copies of permits in respect of 34 above required must be submitted to the Department for record keeping purposes.	Section 5.2
Condition 36. A permit must be obtained from SAHRA for the	Section 6.5

Condition in the Environmental Authorisation	Application in the EMP
relocation of graves and other heritage resources found on site.	
Condition 37 as amended: Copies of permits in respect of **36** above required must be submitted to the Department for record keeping purposes.	Section 6.5
Condition 38 as amended: "Hazardous materials must be stored in regularly serviced containers enclosed in bunded areas. The bunded areas must be provided with a tap-off system, which must be within the bunded area, through which spillages and leakages that might occur will be removed without any spillage outside of the bunded areas."	Section 7.3
Condition 39. Chemical ablution facilities must be available for use by construction staff at all times during the construction period. These facilities must be removed from the site when the construction phase is completed.	Section 7.3
Condition 40. All hard infrastructures should be located within existing low sensitivity and disturbed areas as far as possible	Section 7.3
Condition 45. Signs must be placed along construction roads to identify speed limits, travel restrictions, and other standard traffic control information. To minimise impacts on local commuter, consideration should be given to limiting construction vehicles on public roadways during the morning and late afternoon commuting time.	Section 7.3
Condition 46 as amended: "Construction, other than of the authorised dam wall and weir must include appropriate design measures that allow surface and subsurface movement of water along drainage lines so as not to impede natural surface and subsurface flows. Drainage	Section 7.9

Condition in the Environmental Authorisation	Application in the EMP
measures must promote the dissipation of storm water run-off."	
Condition 47. Burrow materials must be obtained only from authorised and permitted sites.	Section 7.11
Condition 48 as amended: Liaison with land owners/farm managers is to be done prior to construction in order to provide sufficient time for them to plan agricultural activities in so far as the liaison with land owners or users does not conflict with any other Act of Parliament.	Section 6.1
Condition 49. An integrated waste management approach must be implemented that is based on waste minimisation and must incorporate reduction, recycling, re-use and disposal where appropriate. Any solid waste shall be disposed of at a landfill licensed in terms of section 20 (b) of the National Environmental Management Waste Act, 2008 (Act 59 of 2008).	Section 6.4
Condition 50. A copy of this authorisation must be kept at the property where the activity will be undertaken. The authorisation must be produced to any authorised official of the Department who requests to see it and must be made available for inspection by any employee or agent of the holder of the authorisation who works or undertakes work at the property.	Section 3.3
Condition 52. The holder of the authorisation must notify the Department, in writing and within 48 (forty eight) hours, if any condition of this authorisation cannot be or is not adhered to. Any notification in terms of this condition must be accompanied by reasons for the non-compliance. Non-compliance with a condition of this authorisation may result in criminal prosecution or other actions provided for in the National Environmental Management Act, 1998 and the	Section 4.2

Condition in the Environmental Authorisation	Application in the EMP
regulations.	

1.3 PURPOSE OF THE EMP

The GLeWaP entails the construction of a large storage dam on the Groot Letaba River and associated National Bulk Water Distribution Infrastructure (pipelines, pump stations, balancing dams, off-takes and reservoirs) in the Limpopo Province of South Africa. This EMP applies to the Contracts issued for the construction of the GLeWaP.

The GLeWaP EMP will ensure that the environment is appropriately considered during the design and construction phases of the project. The EMPs should provide a practical implementation framework for the mitigation measures recommended in the EIR, as well as monitoring, auditing and taking corrective actions during implementation.

1.4 PROJECT TEAM

ILISO Consulting (Pty) Ltd was appointed as the independent Environmental Assessment Practioner (EAP) to undertake the EIA and compile the EMP with input from the specialists mentioned below.

Dr Martin van Veelen is a professional engineer with a PhD in aquatic health. He is the Business Unit Head of the ILISO Environmental Management Discipline Group and a certified Environmental Assessment Practitioner with 30 years experience. He specialises in project management, environmental impact assessments and water resource planning. He specifically has extensive experience in water quality, especially water quality management, water quality monitoring and water quality assessment. Martin has experience in managing projects that involve multi-disciplinary teams, and projects that involve public consultation and participation. Martin is the project leader and undertook the water quality specialist study.

Terry (Baker) Calmeyer is a certified Environmental Assessment Practitioner (EAP), has a Masters in Environmental Management and specialises in Environmental Impact Assessments and Project Management. She has been involved in a variety EIAs including for transmission lines, water supply projects, dams, roads and airports, in South Africa, Botswana, Uganda, Lesotho, and Mozambique. She has been involved in public participation programmes, water quality assessments, socio-economic and institutional development projects and the use of Geographic Information Systems on a number of projects. Terry is actively involved in the International Association for Impact Assessment, and was the President of the South African affiliate in 2012/2013. Terry was EIA the Project Manager and was responsible for the Revision 1 of the EMP.

Deon Esterhuizen has a MSc in Environmental Management with 20 years of experience in water related projects, which include water quality management, registration and licensing of water users, completion of Environmental Impact Assessments in support of the issuing of Record of Decisions, development of a management guide for domestic water use, project management, and implementation of the Resource Directed Measures as required by the Department of Water Affairs. He was part of the team that compiled the Environmental Management Plan for the Gautrain Rapid Rail Link Project. Deon was responsible for compiling the Revision 0 EMPs for this project.

Consultant Name	Company Name	Specialist Study Name
Dr Johnny van Schalkwyk	National Cultural History museum	Heritage Impact Assessment
Mr Bert de Vries	ILISO Consulting (Pty) Ltd	Traffic Impact Assessment
Mr Derek Cosijn	Jongens Keet and Associates	Noise Impact Assessment
Mr Peter Kimberg	Golder and Associates	Aquatic Ecology Specialist Study
Mr Cameron von Bratt	Golder and Associates	Aquatic Ecology Specialist Study
Mr Graham Deal	Ecorex	Terrestrial Ecology Specialist Study
Ms Renee Thomas	Airshed	Air Quality Specialist Study

Mr Russell Arid	Kayamandi	Economic Specialist Study
Ms Nanja Churr	Kayamandi	Economic Specialist Study
Ms Anita Bron	MasterQ Research	Social Impact Assessment
Ms Karen James	Insite	Visual Impact Assessment
Ms Jo- Anne Thomas	Savannah	Environmental Management Programmes
Mr Andrew Dickson	Margot Saner and Associates	Health Impact Assessment
Prof Gerrit Basson	ASP Technology	Sedimentation Impact Assessment

1.5 APPROACH

Twelve specialist studies were undertaken during the environmental assessment of the GLeWaP, which considered the potential impacts of the GLeWaP and associated infrastructure on the receiving environment.

The findings of all the specialist studies were distilled, examined and captured in the EIR. All mitigation measures prepared by the twelve specialists were assessed for relevance and summarised in the EIR. The proposed mitigation measures have been incorporated into the relevant EMPs through the development of management and mitigation plans. The various management and mitigation plans that are needed to address the potential impacts of the proposed project are described later.

2. DESCRIPTION OF THE PROJECT

The Groot Letaba River Water Development Project is aimed at improving the management of the water resources in the catchment and consists of non-infrastructure options to manage the available water as well as the construction of infrastructure components. Although only the construction of the infrastructure components require authorisation from the DEA and are subject to the EIA, they must be seen as being complemented by the non-infrastructure components.

2.1 INFRASTRUCTURE COMPONENTS OF THE PROJECT

The infrastructure components of the project that have been subjected to the EIA and are governed by this EMP include:

- Construction of a dam at the site known as Nwamitwa on the Groot Letaba River, downstream of the confluence of the Nwanedzi River. The Environmental Impact Assessment was based on a dam wall that could be up to 36 m high and have a gross storage capacity of 144 million m^3. The catchment area of the proposed dam at the site known as Nwamitwa is up to 1 400 km^2 and the Mean Annual Runoff (MAR) is approximately 122,6 million m^3 under natural undeveloped conditions. The estimated increase in system yield available for domestic use is up to 18 million m^3/a after providing for the Reserve;

- Parts of the R529, D1292 and P43/3 roads will have to be re-aligned to accommodate the dam;

- Upgrading of water treatment works;

- Construction of bulk water pipelines and pump stations from the dam for water supply for domestic use to communities in the area. Currently four pump stations and four reservoirs are envisaged;

- Borrow areas from which materials required will be sourced;

- Construction activities will take approximately 5 years with several construction teams working concurrently in different areas at the proposed dam site and along the pipeline routes;

- Residential accommodation for construction staff will be established in the vicinity of the proposed dam or in established towns. Housing, internal roads, water and electricity supply, water treatment, solid waste disposal, emergency facilities and recreational amenities will be provided; and

- Construction sites will include offices, internal roads, water and electricity supply, waste water treatment, solid waste disposal, emergency facilities, areas for the handling of hazardous substances, workshops, wash bays, areas for the safe storage of fuel and explosives and communication infrastructure.

3. ORGANISATIONAL STRUCTURE

Effective environmental management during the planning, design and construction phases of the project will be dependent on a number of project personnel. The purpose of this section is to define roles for personnel and allocate responsibilities in the execution of the EMP.

3.1 DEPARTMENT OF ENVIRONMENT 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 GLeWaP is implemented in a sustainable manner, in compliance to the relevant environmental legislation. DEA is responsible for approving the EMP for the GLeWaP and any revisions and amendments thereto.

3.2 DEPARTMENT OF WATER AFFAIRS (DWA)

The DWA is the applicant of the authorisation, the developer of the project and the Contractor and Engineer's Client. Under the South African environmental law, applicants are accountable for the potential impacts of activities being undertaken as well as managing these impacts. DWA, therefore, has the overall environmental responsibility to ensure that the implementation of the EMP complies with national and provincial legislation as well as with the conditions of the Environmental Authorisation (EA).

The DWA must compile a project communication strategy that includes directly affected persons and anybody with rights to any immediately adjacent properties that must be submitted to the DEA prior to the commencement of construction.

The DWA may delegate environmental compliance / responsibility to nominated agents such as the Engineer.

The holder of the authorisation must submit an environmental audit report upon completion of the construction and rehabilitation activities.

The environmental audit report must indicate the date of the audit, the name of the auditor and the outcome of the audit in terms of compliance with the environmental authorisation conditions as well as the requirements of the EMP.

3.3 ENGINEER

The Engineer is responsible for design of the works and supervision of the contract. The Engineer is the DWA's representative onsite and is ultimately responsible for:

- Compliance with legal environmental requirements.
- Confirming that the EMP forms part of the contract documents.
- Placing the EMP on the site meeting agenda.
- Directs on site teams implementation and compliance with the EMP.
- Consults and co-operates with the Environmental Control Officer (ECO) appointed by the DWA on environmental matters.
- Reports to DWA.
- The Engineer may appoint an Engineer's Environmental Representative (EER) to plan and direct the implementation of the EMP and provide advise on environmental matters.

The EER will:

- Provides support and advice, via the Engineer regarding environmental matters during the entire project lifecycle.
- Distribute all statutory requirements, including permits, authorisations and licences.
- Keep a copy of the Environmental Authorisation and EMP on site.
- Provides Environmental Awareness training for the Engineers staff.
- Ensures that the Code of Conduct is signed by all personnel responsible for activities that could have a negative impact on the environment.
- Reporting at site construction meetings.
- Manage a schedule of Internal Audits. Internal audit reports are submitted to the Engineer.
- Maintain and manage a complaints register.
- Maintain and manage an incidents and non-conformance register.
- Keep a record of proof of all training undertaken on site.

- Keep records relating to monitoring and auditing on site and make these available for inspection to any relevant and competent authority in respect of this development.

3.4 ENVIRONMENTAL CONTROL OFFICER (ECO)

An Independent Environmental Control Officer (ECO) will be appointed by the DWA to monitor and audit compliance and report environmental compliance to the DEA. Once appointed, the name and contact details of the ECO must be submitted to the Director: Compliance Monitoring of the DEA. The ECO will:

- Keep record of all activities on site, problems identified, transgressions noted and a task schedule of tasks undertaken by the ECO.
- Confirm that the requirements of the EMP are communicated understood and implemented by personnel on site.
- Manage scheduled audits and inspections on contractors' performance on site.
- Monitors EMP compliance through regular site visits and inspections during the pre-construction, construction and rehabilitation phases.
- Submits compliance reports to DEA.
- Submit emergency incident reports (example in **Appendix C**) to DEA for all Level 3 to 5 incidents (as defined in **Table 4.1**).
- All documentation e.g. audit/monitoring/compliance reports and notifications, required to be submitted to the Department in terms of this authorisation, must be submitted to the *Director: Compliance Monitoring* at the Department

3.5 CONTRACTOR

The Contractor implements the EMP specifications on site. The Contractor may appoint an environmental representative (the Contractor's Environmental Representative (CER)) to assist with the implementation of the EMP.

The Contractor's Environmental Representative (CER) will:

- Provides Environmental Awareness training for Contractors Engineers, foremen, site staff and any visitors to the site. A record of all training and visitors induction must be kept on site.
- Ensures that the Code of Conduct is signed by all personnel responsible for activities that could have a negative impact on the environment.

- Undertaking monitoring, analysing data and reporting to Engineer and the ECO on a monthly basis.
- Maintain and manage an incidents and non-conformance register.

3.6 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 EMP shall be included with the tender 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 EMP.
- Fines and penalties shall be managed in accordance with the Public Management Finance Act.

3.7 PENALTIES AND FINES

A penalties and fines system shall be developed and implemented by the Contractor.

A guideline of minimum fine values is provided for minor, moderate and serious offences in the table below.

Table 3.1: Table depicting guidelines for fines and offences

Offences	Fine
Minor offences Littering Possession of intoxication substances on site. Failure to use ablutions. Moving on areas recently landscaped. Disturbing grassed areas. Not parking in demarcated areas. Not using safety equipment Wasting of water and electricity. Not removing domestic waste off site. Not stockpiling topsoil adequately.	R 1500 - 00
Moderate offences	

Oil spills Persistent oil leeks on vehicles. Generation of excessive dust and noise. Transgression of the speed limit. Illegal fires. Burying of waste. Use of intoxicate substances on site. Lack of erosion control. Entering non-demarcated areas. Hunting and snaring. Damaging of pre- identified trees.	R 5000-00
<u>Serious offences</u> Large oil/ hazardous waste spill. Removal of pre-identified trees. Damage of pre- identified heritage sites or objects. Continually exceed noise limits. Transgression of legal requirements. Sanitation facilities not adequate. Pollution of groundwater. Removal of any protected plant or other species. Damage or pollution of wetlands.	R15 000.00

These fines should be issued in addition to any remedial costs included as a result of the non-compliance, as well as any statutory penalty or fine (if applicable) which will also be for the offender's expense.

4. COMPLIANCE MONITORING

4.1 CODE OF CONDUCT

The Engineer must compile a Code of Conduct that all of the Engineers and Contractors personnel responsible for activities that have potential impacts on the environment must sign.

4.2 METHOD STATEMENTS

A Method Statement must be compiled for every activity undertaken by the Contractor which poses a risk to the environment (natural, biophysical and social). The Method Statements must include the following information:

- Responsible person (name and ID number) and an alternative (name and ID number);
- Legal Requirements;
- Training Requirements;
- PPE required;
- Method by which the activity will be undertaken;
- Emergency Procedures;
- Response in the case of a non-compliance; and
- All Method Statements must be signed by the Engineer

An example of a Method Statement is included in **Appendix B**.

Method Statements for the following activities are required by this EMP:

- Training
- Fencing
- Waste Management
- Water Management
- Air Quality Management
- Traffic Management, and
- Relocation of fauna

The EER or ECO may require additional Method Statements for any aspects or activities that are identified as problematic or not complying with targets in the EMP.

4.3 INCIDENTS AND NON-CONFORMANCES

According to Section 30 of the National Environmental Management Act (NEMA) an Incident is defined as:

"*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 . The incident must be reported to the ECO and the Department of Environmental Affairs as per Section 30 (3) of National Environmental Management Act (Act No. 107 of 1998). An emergency incident report required in terms of Section 30(5) NEMA (example attached as **Appendix C**) must be submitted to the Department of Environmental Affairs, Environmental Management Inspectorate for processing. A close out certificate will be issued by the Inspectorate indicating that measures undertaken were to the department's satisfaction.

A chemical spill is defined as a potential liquid hydrocarbon or chemical spills or other releases 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 environmental in **Table 4.1**. Appropriate responses are indicated.

Table 4.1: Classification of Environmental Incidents

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	Recorded in the incidents register and managed accordingly

Level	Definition	Response Required
	property outside of the boundaries of Clients's property.	
Level 2	A Level 2 Incident is defined as a Moderate Emergency which is disruptive, but not extensive, and forces a portion 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.	Recorded 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 and Engineer as to whether work stopage 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 the DEA, in writing and within 48 (forty eight) hours, if any condition of this authorisation 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 Environmental Authorisation may result in criminal prosecution or other actions provided for in the National Environmental Management Act, 1998 and the regulations.

4.4 CHECKING AND CORRECTIVE ACTION

4.4.1 Monitoring

A series of environmental variables that are to be monitored during the pre-construction and construction phases should be developed for identified aspects, such as surface water monitoring, noise monitoring, air quality monitoring etc. Monitoring results should be presented monthly. Where the target values are not met, further mitigation action (development of detailed method statements) should be considered.

4.4.2 Inspections

Some potential impacts are difficult to monitor quantitatively such as soil erosion and waste management. Daily visual inspections of all construction sites should be undertaken.

4.4.3 Internal Audits

Where monitoring data and the inspection reports highlight problems, an internal audit could be initiated. The EER is responsible for undertaking Internal Compliance Audits that cover the EA, EMP, Method Statements and Tender Specification. The purpose of the audit is to ascertain the source of the problem and define what action must be taken to prevent its re-occurrence. Detailed method statements could be the outcome of the internal audit.

4.4.4 ECO audits

The ECO will undertake quarterly audits and submit audit reports to the DEA, after client review.

4.4.5 Corrective action

There are several levels at which corrective action can be affected, namely verbal instructions, written instructions and contract notices.

5. LEGISLATIVE REQUIREMENTS AND PRINCIPLES

5.1 ENVIRONMENTAL PRINCIPLES

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

The environment is considered to be composed of both biophysical and social components.

- Construction is a disruptive activity and all due consideration must be given to the environment, including the social environment, during the execution of a project to minimise the impact on affected parties.
- Minimisation of areas disturbed by construction activities (i.e. the footprint of the construction area) should minimise many of the construction related environmental impacts of the project and reduce rehabilitation requirements and costs.
- As minimum requirements, all relevant standards relating to international, national, provincial and local legislation, as applicable, shall be adhered to. This includes requirements relating to waste emissions (e.g. hazardous, airborne, liquid and solid), waste disposal practices, noise regulations, road traffic ordinances, etc.
- Every effort should be made to minimise, reclaim and/or recycle "waste" material.

5.2 ENVIRONMENTAL PERMITS, LICENCES AND AUTHORISATIONS

The following authorisations and permits are required prior to the activity commencing:

- **Blasting** - Blasting permits are required from the Department of Mineral Resources in accordance with the Explosives Act (Act No 26 of 1956).
- **Waste disposal** - All wastes (general and hazardous) generated during the construction may only be disposed of at appropriately licensed sites. Government Notice (GN) 921, promulgated in terms of the National Environmental Management: Waste Act (Act 59 of 2008) (NEMWA), lists Waste Management Activities in respect of which a waste management licence is required; these include various activities associated with the storage of waste, reuse, recycling and recovery of waste, treatment of waste (which includes the

remediation of contaminated land) and disposal of waste. The Schedule to the Notice distinguishes between two categories of waste management activities which require licensing and for which a basic assessment process (for Category A Waste Management Activities) or an Environmental Impact Assessment process (for Category B Waste Management Activities) must be conducted.

Construction activities usually result in hazardous as well as general waste.

NEMWA defines "general waste" as waste that does not pose an immediate hazard or threat to health or to the environment, and includes—

(a) domestic waste;

(b) building and demolition waste;

(c) business waste; and

(d) Inert waste.

Where

"building and demolition waste" means waste, excluding hazardous waste, produced during the construction, alteration, repair or demolition of any structure, and includes rubble, earth, rock and wood displaced during that construction, alteration, repair or demolition; and

"inert waste" means waste that—

(a) does not undergo any significant physical, chemical or biological transformation after disposal;

(b) 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

(c) does not impact negatively on the environment, because of its pollutant content and because the toxicity of its leachate is insignificant.

- NEMWA GN 926 presents the norms and standards for the storage of waste. The requirements of waste storage facilities; management of waste storage facilities; and general provisions required, are outlined.
- **Storage of hazardous substances** - Hazardous substances must be stored and handled in accordance with the appropriate legislation and standards, which may include the Hazardous Substances Act, the Occupational Health and Safety Act, and relevant associated Regulations.
- **Health and safety of work teams** - Construction Regulations (2003) published under the Occupational Health and Safety Act (Act No 85 of 1993) apply to

construction activities including "the moving of earth, clearing of land, the making of an excavation, piling, or any similar type of work". A "health and safety plan" which addresses hazards, and includes safe working procedures to mitigate, reduce or control the hazards identified, is required under this Act. A risk assessment must also be undertaken by an appropriately qualified person(s) and the Contractor shall ensure that all employees under his or her control are informed, instructed and trained by a competent person regarding any hazard and the related work procedures before any work commences, and thereafter at such times as may be determined in the risk assessment.

- **Heritage resources –** Before any heritage resources are demolished or damaged a permit should be obtained prior to any actions been taken. Permit applications must be submitted to South African Heritage Resources Agency (SAHRA).
- **Removal of trees –** The removal of trees from the dam basin requires a permit in terms of the National Forest Act (No 84 of 1998).
- **Removal and transportation of endangered fauna and flora -** A permit must be obtained from the relevant nature conservation agency for the removal or destruction of indigenous protected and endangered plant and animal species. Copies of permits required must be submitted to the DEA for record keeping purposes.
- **Water abstractions –** Water abstracted from any sources for construction purposes requires authorisation.
- **Removal of graves -** Permits are required for the removal of graves in terms of the National Heritage Resources Act (No 25 of 1999) section 36.
- **Asphalt Plants** - GN 893 of 2013 in GG 37054 dated 22 November 2013 provides a list of activities which result in atmospheric emissions which have or may have a significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage. Activities include Macadam preparation (the mixing of aggregate and tar or bitumen to produce road surfacing in permanent facilities and mobile plants). These activities require an Atmospheric Emission Licence in terms of Section 37 of the Act.
- **Borrow areas and Quarries -** Government Gazette No 26501 dated July 2004 states that the Minister of the Mineral Resources, acting in terms of section 106 (1) of the Mineral and Petroleum Resources Development Act, 2002 (Act No 28 of 2002) (MPRDA) exempts the Department of Water Affairs, amongst other

institutions, from the provisions of sections 16, 20, 22 and 27 of said Act in respect of any activity to remove any mineral for the construction and maintenance of dams, harbours, roads and railway lines and for purposes incidental thereto. Section 106 (2) of the MPRDA says that in such cases the DWA must still compile an Environmental Management Programme (EMP) for approval in terms of Section 39 (4) of the Act.

5.3 CONSTRUCTION INDUSTRY DEVELOPMENT BOARD

The Construction Industry Development Board (CIDB) is a Schedule 3A public entity established by Act of Parliament (Act 38 of 2000) to promote a regulatory and developmental framework that builds the construction delivery capability for South Africa's social and economic growth.

The Construction Registers Service of the CIDB comprises the Register of Contractors and the Register of Projects which have been established in terms of the CIDB Act (Act 38 of 2000). The Register of Contractors grades and categorises contractors according to financial and works capability. It is mandatory for public sector clients to apply the Register of Contractors when considering construction works tenders. The Register of Contractors facilitates public sector procurement and serves as a framework for contractor development.

6. PRE-CONSTRUCTION SPECIFICATIONS

6.1 GENERAL

This section of the EMP provides a framework for environmental protection during the planning and design phases of the project, leading up to, but not including, the establishment on site by the appointed contractor. This period will typically include investigative activities such as confirmation of materials availability, archaeological site protection and rescue, fencing and relocation and compensation of affected communities.

The pre-construction activities are the responsibility of DWA.

6.2 LAND ACQUISITION

The land acquisition process should take into consideration the following legal processes:

a) Determine compensation in manner prescribed by legislation.

b) Compilation of a compensation and development plan that includes the prioritisation of the land acquisition process in accordance with the established legal procedures to minimise impacts on citrus farmers that require a lead time to re-establish their landuse, and the procedures to deal with the loss of rights of access to water.

c) Once the strategic approvals (i.e Ministerial approval of the project as a Government Water Scheme, and Environmental Authorization of the development proposals) are in place, land owners should be advised of the land that is required for the project.

d) Detailed plans should be prepared of each property affected by the project, indicating the extent of the land and improvements that have to be acquired.

e) Land valuers should be appointed to assess the fair market value of the land and improvements to be acquired on each property, taking into account the policy in relation to the maintenance of the rights to use existing water allocations for irrigating new orchards of the same business enterprise.

f) Compensation is based on fair market value.

g) Notifications of and acquisitions on a specific date, with offers of compensation, should be served on each land rights owner in respect of each portion of land affected by the project.

h) The World Commission of Dams work highlights the issue of social impacts on vulnerable groups and individuals when large dams are constructed. For this activity these groups could be individuals with unregistered rights or who currently provide part time labour on citrus farms. Compensation of these groups of people will addressed in accordance with the relevant laws that apply.

i) Align employment opportunities with the unemployed.

6.3 PROTECTION OF VEGETATION

a) Prior to clearance of any area for construction activities, a thorough quadrant search of the footprint must be undertaken during the flowering season to search for the known Red Data List (RDL) floral species listed in terrestrial ecology specialist study in support of the EIR, in order to rescue affected species. Individual can be translocated to the outside of the footprint or removed to a suitable botanical garden for cultivation and protection. This should only be done after consultation with provincial conservation authorities

b) Any plants or trees of value, close to the construction servitude that will remain, should be marked clearly and must not be disturbed, defaced, destroyed or removed for the duration of the Contractor's presence on site, unless otherwise specified by the ECO through the Engineer.

6.4 PROTECTION OF FAUNA

a) An animal specialist appointed specifically to identify animal species as defined in the EIR to be relocated must have undertaken their fieldwork on the demarcated construction servitude prior to the Contractor commencing with land clearing.

b) An animal rescue operation should be implemented for the dam basin (excluding the dam wall solum where these species were not found) and pipeline routes prier to disturbance, targeting the rescue and translocation of threatened, endemic and protected species where possible; scientific institutions should also

be invited to collect live specimens. Particular emphasis should be on beetles *Dromica oberprieleri* and *Megacephala regalis vansoni*, flat rock scorpions (*Hadogenes troglodytes*), and baboon spiders *Opistophthalmus glabrifrons* and *Opistacanthus asper*.

c) Possible receiver sites for the protected species need to match the natural habitat and where possible remain within the same general area, to prevent negatively impacting on other species.

d) Receiver sites must be checked for suitability and abundance of species to encourage virility.

6.5 PROTECTION OF CULTURAL HISTORICAL ASPECTS AND GRAVES

a) An archaeologist and anthropologist appointed specifically to identify, locate and map all features and sites of social and/or cultural, historical, and archaeological significance to be protected during construction must have completed their task prior to the Contractor disturbing any areas where important sites have been identified.

b) Some sites near the construction servitude may be demarcated as no go areas for protection.

c) Graves and archaeological sites above the Full Supply Level should not be disturbed.

d) Do not disturb deface, destroy, or remove protected features and sites, whether fenced or not.

e) The identification and mitigation policy for graves must be determined before impacting on the area.

f) A permit must be obtained from SAHRA for the relocation of graves and other heritage resources found on site. Copies of permits required must be submitted to the DEA for record keeping purposes.

6.6 PROTECTION OF AQUATIC ECOSYSTEM

a) A survey evaluating the presence of the exotic fish within farm dams/reservoirs in the proposed Nwamitwa dam project area is to be undertaken. Particular

reference should be on Black Bass (*Micropterus salmoides* and *Micropterus dolomieu*), Nile Tilapia (*Oreochromis niloticus*) and carp (*Cyprinus carpio*).

b) A baseline study of the invertebrate fish communities in the river system is to be undertaken prior to impact on the river system.

6.7 SITE LAYOUT AND ACCESS ROAD PLANNING

a) The applicant must submit a layout plan for the entire dam basin and associated infrastructure for approval to the Department, indicating information as requested and available as at time of authorisation and amended as further information becomes available to the Department and the layout should indicate:

- Foundation footprint;
- Permanent lay down area footprint;
- Construction period lay down footprint;
- Internal roads indicating width (construction period width and operation period width) and numbered sections between the other site elements which they serve (to make commenting on sections possible);
- Wetlands, drainage lines, rivers, stream and water crossing of roads and cables indicating the type of bridging structures that will be used;
- Heritage sites that will be affected by the new dam and associated infrastructure;
- Borrow pits;
- Spoil heaps (temporary for topsoil and subsoil and permanently for excess material);
- Buildings including accommodation;
- Helipad; and
- All “no-go” areas.”

b) In determining the location and extent of access/haul roads, cognisance must be taken of sensitive and no-go areas, which are defined by the botanist, zoologist and archaeologist prior to impacting the area, as well as protecting and maintaining existing private/communal property, fences and gates.

c) Fencing should be avoided and a method statement submitted for approval by the Engineer prior to the erection of any fences.

d) Prior to commencement of construction activities, available dam designs and outlet works must be submitted to the Department for record purposes

6.8 DESIGN PRE-CONSTRUCTION REQUIREMENTS

These specifications are intended to guide the engineers, scientists, surveyors, Contractors and other parties that will be involved in detailed planning for the project and act as a reference during the planning and design of the scheme. The objective is to operationalise the recommendations in the EIA that are to be addressed at the design phase of the project:

a) Dam outlets must have the capacity to withdraw and mix water from multiple levels, and valves must be designed to ensure the immediate aeration of released water.

b) Stratification is predicted to occur in the proposed new dam during summer months, and the release of cold, anoxic bottom water will have a detrimental effect on the aquatic life up to a distance of about 15 km below the dam wall. To overcome the effect a multiple level outlet structure, with outlets at approximately 5 m intervals from 6 m below the full supply level of the dam, should be confirmed during the design phase.

c) The surfacing material of the road should be acoustically designed for noise reduction. Properly designed gap-graded rubber bitumen can reduce the tyre-road interaction noise by at least 5dBA.

d) Strategically placed sections of earth berm or equivalent noise attenuation barrier may be necessary along the edges of the respective road reserves to adequately protect noise sensitive areas.

e) All the necessary acoustic design aspects required should be followed in order that the overall generated noise level from the new installation does not exceed a maximum equivalent continuous day/night rating level (LRdn), namely a noise level of 70dBA (just inside the property projection plane, namely the property boundary) as specified for industrial districts in SANS 10103.

f) Ambient noise levels in the residential areas of Ka-Malubana Village shall not exceed 50dBA during the day and 40dBA at night.

g) Construction personnel accommodation must be placed in an urban area or registered lodges, e.g. Letsitele or Nwamitwa.

h) Bio-monitoring of fish and aquatic invertebrates of the river system should be undertaken before construction activities start and, thereafter, at 6-monthly intervals.

i) Baseline water quality.

j) Based on the impacts predicted from the construction operations a dust fallout monitoring network should be implemented. The dust fall out network is to be implemented before construction commences.

k) Standard Protocol Process of shared water must be finalised prior to commencement of the activities and must be submitted to the DEA for record-keeping.

6.9 INVESTIGATIVE ACTIVITIES

Investigative activities include geotechnical and other pre-construction activities on site.

6.9.1 Authorisation of listed activities

Any activity that requires authorisation in terms of the NEMA or any Specific National Environmental Management Act .

6.9.2 Arrangements for access on site

The DWA must establish a protocol for liaising with landowners and for responding to all landowner queries. A liaison officer must be nominated to be the direct contact with the landowners during the pre-construction period.

Investigating personnel and visitors may under no circumstances enter private land without prior permission from the landowner. The DWA Liaison Officer will be responsible for interacting with and obtaining permission from landowners to access their property. The period and conditions for access to each land portion will be agreed formally with each individual landowner.

6.9.3 Identification of accredited site personnel

Each person required to be on site as a member of the investigating personnel must be issued with an identification card and will be required to carry this card on their person at all times as an identification document.

6.9.4 Access roads and access points

All personnel must make use of existing roads and tracks that are authorised for use by the landowner. A maximum speed limit of 40km/h on site access roads and tracks must be strictly observed at all times, as must be the ruling speed limit on public roads in the project area. Vehicles used for site investigations may not leave the designated roads and tracks and turnaround points.

6.9.5 Accommodation on site

Accommodation arrangements on private land will be by agreement with the landowner and will be facilitated by the DWA Liaison Officer. Under no circumstances may tents, caravans or any other temporary structures be placed in any other position such as in open fields at work areas..

6.9.6 Record-keeping

The DWA Liaison Officer will keep a record of all field visits and contacts with landowners by investigating personnel.

6.9.7 Requirements for managing environmental impacts on site

Oil and fuel spill management

Vehicles and equipment must undergo regular inspection and maintenance to avoid fuel and oil leaks, as well as to remove combustible material that may be the cause of accidental fires. All areas from which surface water runoff could possibly be contaminated by oils, grease and fuel must be identified and made safe.

Access to water for geotechnical drilling purposes

No water use, as per Section 21 of the National Water Act (Act No. 36 of 1998) (including any activities in wetlands), is permitted without the necessary authorisation. This authorization will be obtained by the DWA.

Water for human consumption

Water for human consumption will be brought to site by the Contractor in a water tank and the water will be obtained from a potable source.

Fire prevention and management

No open fire is permitted in works areas or in camping areas and the collection on site of firewood or other fuel is strictly prohibited. Fire suppression equipment must be located at specific points in work areas, storage sites and field camps, as designated by the DWA. The Contractor will ensure that specific staff undergo basic fire fighting training and place on record copies of certificates to this effect. Contractor will ensure that all staff working on site have gone through fire danger awareness training before work on site can commence. The fire fighting equipment required on site is:

- Fire extinguishers (dry powder canisters) placed at storage, field camps and accommodation sites
- A 500 litre water tanker with pump on a dedicated fire fighting bakkie
- Hand held equipment (fire beaters and Raco)

Protection of fauna

No wild, domesticated or farm animals may, under any circumstances, be fed, hunted, snared, captured, injured or killed. Personnel must report any animal found dead or injured in traps or snares to the DWA Liaison Officer who will take appropriate action.

Protection of vegetation

Contractors may clear vegetation for storage and camp areas as approved by the DWA. No plants or trees outside of the designated camp or work areas may be disturbed, defaced, destroyed or removed.

Topsoil conservation

Topsoil is defined as the A Horizon which is the upper soil profile approximately 20cm deep. The topsoil cleared for purposes of an investigation must be stock-piled separately from the sub-soils and replaced from where it was removed once investigations have been completed. After completion of drilling and execavation of trail pits the Contractor must rehabilitate the disturbed sites by replacing the topsoil and landscape the area to control storm runoff.

Protection of cultural and heritage resources

The Contractor may not disturb, deface, destroy or remove protected heritage resource features, whether fenced or not. If any archaeological features, graves or skeletal remains are found during the course of the geotechnical investigation, work must cease and the DWA Liason Officer informed immediately. Work may proceed only once the site has been investigated by a person nominated by the DWA and has been signed off as being cleared.

Solid waste management

Domestic and all other waste from any temporary accommodation area, from any storage area and from all work areas and drilling activities must be collected and disposed of at the nearest registered solid waste disposal facility. No solid waste may be burned on site. The Contractor must provide proof of landfill acceptance and waste receipt to the DWA.

Toilet facilities

Contractors must provide at least one portable chemical toilet at each work area for every 30 workers at that site. Site toilets may not be located within the 1:100 year flood line, or within a horizontal distance of 100m (whichever is greater) of a watercourse, drainage line or identified wetland. Site toilets must be regularly maintained and cleaned so as to keep them in good, functional working order and in an acceptable state of hygiene. Drinking water facilities and hand washing facilities must be located conveniently near to site toilets. Toilets must be screened from view by means of shade cloth.

Hydrocarbon wastes, accidental spills and hazardous wastes

Compliance with all national, regional and local legislation with regard to the disposal of hydrocarbons, chemicals, solvents and any other harmful and hazardous substances and materials must be ensured. All hazardous waste must be collected in receptacles located on a drip tray on site for disposal at a registered hazardous waste disposal site. Accidental chemical spills must be contained for cleanup and control by the supplier, or by a professional pollution control service provider. Fuel spill absorption kits must be available on site.

Water pollution control

No substance which may cause water pollution may be stored within the 1:100 year flood line, or within a horizontal distance of 100m (whichever is greater) of a watercourse, drainage line or identified wetland. No waste of any nature may be dumped into any watercourse, drainage line or wetland. Swimming, bathing, and the cleaning of clothing, tools or equipment in all watercourses, drainage lines and wetlands is prohibited.

Infilling in river

Contractors may not make infillings by soil or any other material in a river or wetland for crossing or drilling purposes without prior approval. Approval for such actions must be arranged by DWA.

Landscaping and rehabilitation

All test pits dug for investigation purposes must be properly filled in, compacted and covered with topsoil.

Damage to private land or property

Any damage caused to landowner assets must be reported immediately to the DWA Liaison Officer who will report it to the landowner and arrange for repairs to be done or for a claim for compensation to be lodged with the DWA. The cost of repairs or compensation for accidental damage will be for the account of the Contractor.

Health and safety specifications

The DWA Health and Safety Requirements shall apply to all Contractors.

7. MANAGEMENT AND MITIGATION PLANS FOR CONSTRUCTION

This section provides specific and detailed management and mitigation plans for the construction phase of the project. Each management and mitigation plan deals with a specific construction or environmental aspect. The management and mitigations plans structure provides for a section that describes the purpose of the aspect, the specific components of the aspect, objectives and targets for each component and specific management and mitigation requirements.

Table 7.1. provides a summary of the identified management and mitigation plans and relevant components per management and mitigation plan.

Table 7.1: Management and Mitigation Plans

Management and Mitigation Plans
CHAPTER 7.1
Socio-economic management plan
Influx of job seekers
Outflow of labourers
Formal employment opportunities to local individuals
Animal- human conflict
Temporary loss of cultivated land
Temporary loss of grazing land
Integration with local communities
Physical splintering
Employment Strategy
Exit Strategy
CHAPTER 7.2
Community Consultation and Disclosure
Complaints management
CHAPTER 7.3
Construction site
Establishment of site office
Ablution facilities
Eating areas
Training and induction of construction staff
Handling and disposal of contaminated water
Hazardous material storage
Vehicle and equipment refuelling
Water conservation
Contractors camp and lay down areas
Batching Plants

Management and Mitigation Plans
Roads and Access
Gates and fences
Site Closure
CHAPTER 7.4
Solid Waste Management
Domestic waste
Construction waste
Hazardous waste
CHAPTER 7.5
Visual Aesthetics
Raising of Tzaneen dam
Visual of new dam
CHAPTER 7.6
Air Quality
Truck transport and road dust entrainment
Excavation and earthworks
Stockpiles and spoil dumps
Vehicle and machinery emissions
Dust on Citrus
CHAPTER 7.7
Noise Control
General noise
Noise from plant and machinery
Noise from blasting
Noise from vehicles
CHAPTER 7.8
Traffic
Additional turning lanes
Construction signage
Traffic movement of construction vehicles
CHAPTER 7.9
Water Management
Stormwater runoff and discharge
Erosion protection
Floodlines
Proximity to rivers, streams and/or wetlands
Water abstracted from rivers/streams
River crossings/alteration of water courses
Pollution control
CHAPTER 7.10
Aquatic Ecosystem
Removal of riparian vegetation
Reinforcement and protection of downstream banks and streambed
Drainage of all farm dams within the dam basin
Aquatic Life monitoring
CHAPTER 7.11
Material Sourcing and Earthfill Stockpiles

Management and Mitigation Plans
Material sourcing
Earthworks/stockpiles
CHAPTER 7.12
Topsoil
Topsoil stripping
Topsoil stockpiling
Topsoil storage
CHAPTER 7.13
Spoil Management
Locating spoil disposal sites
Transporting spoil
CHAPTER 7.14
Fauna and flora
Protection of ecologically sensitive areas/ habitats and endangered fauna and flora
Weeds and alien vegetation
Rare and protected species
Firewall regimes
CHAPTER 7.15
Heritage
Protected heritage sites
Chance heritage finds
CHAPTER 7.16
Health and Safety
Disaster management plan
Safety of construction workers
Construction related diseases
CHAPTER 7.17
Site Rehabilitation
Disturbed areas to be rehabilitated
Re-vegetation of disturbed areas
Souring of material from borrow areas and blasting areas
Maintenance of rehabilitative measures
Rehabilitation of marginal vegetation
CHAPTER 7.18
Monitoring
Noise monitoring
Air quality monitoring
Water quality monitoring
Aquatic life monitoring

Each management and mitigation plan includes objectives, targets and mitigation requirements. If the mitigation requirements are found to be insufficient to effectively mitigate potential negative impacts the contractor may be instructed to prepare a detailed method statement to effectively mitigate potential negative impacts.

7.1 SOCIO - ECONOMIC MANAGEMENT PLAN

7.1.1 Purpose

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.

7.1.2 Components

The following components have been addressed in this social mitigation plan:

a) Influx of job seekers.
b) Outflow of labourers.
c) Formal employment opportunities to local individuals.
d) Temporary loss of cultivated land.
e) Animal –human conflict.
f) Temporary loss of grazing land.
g) Integration with local communities.
h) Physical splintering.
i) Employment strategy.
j) Exit Strategy.

a. Influx of job seekers

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 that will include the formation of a labour desk.
- Prevent loitering of individuals at the construction site.
- Discourage the formation of informal settlements in or close to the construction site.

Management and mitigation requirements

A recruitment policy and process should be compiled in consultation with the municipalities and Traditional Authorities (establishment of a labour desk). Communicate employment procedures / policy to local stakeholders, especially community representative organisations and ward councillors.

- Have clear rules and regulations for access to the construction site/ office.
- Construction workers should be clearly identifiable as far as practical.
- The construction site should be demarcated and access should be controlled by means of a security access point.

b. Outflow of labourers

Objective

To ensure that, where local labourers leave the area in search of employment, they do not have a negative impact on the community.

Targets

- Ensure an informed labour force and community in terms of issues related to migrant labour, particularly health risks.
- Build capacity within the local community.
- Ensure a more sustainable economic injection into the local community that can be sustained over the longer term.

Management and mitigation requirements

- Develop skills transfer plans (e.g. portable skills training) that would enable a worker to move from one project to another project within the same area.
- Payment should comply with applicable Labour Law legislation in terms of minimum wages.
- Where local labourers are employed on a more permanent basis, cognisance should be taken of the Labour Law in terms of registering the worker with the Unemployment Insurance Fund (UIF), Pay as you earn (PAYE), workman's compensation and all other official bodies as required by law. This would enable the worker to claim UIF as a means of continuous financial support when the worker's position on the construction team has either become redundant or once the construction phase comes to an end.

c. Formal employment opportunities to local individuals

Objective

- Establish a labour desk to facilitate local employment opportunities.
- Ensure that formal employment opportunities benefit local residents and/or service providers.

Targets

- Employ people from the community as far as possible.
- Offer training opportunities to ensure sustainable skills development within the community.
- Provide for alternative employment opportunities through the development of portable and other skills;
- Ensure a more sustainable economic injection into the local community that can be sustained over the longer term.

Management and mitigation requirements

- Unskilled job opportunities should be afforded to local residents. Local trade unions could assist with the recruitment process to counteract the potential for social mobilisation.
- Equal opportunities for employment should be created to ensure that the local female population also have access to these opportunities. Females should be encouraged to apply for positions.
- Individuals with the potential to develop their skills should be afforded training opportunities. The DWA or its appointed contractors should be involved in this process.
- Mechanisms should be developed to provide alternative solutions for creating job security upon completion of the project. This could include formal and/or informal training on how to look for alternative employment, information on career progression, etc. to ensure that people are equipped to seek other jobs with the skills that they have gained.
- Payment should comply with applicable Labour Law legislation in terms of minimum wages.
- Where local labourers are employed on a more permanent basis, cognisance should be taken of the Labour Law in terms of registering the worker with the Unemployment Insurance Fund (UIF), Pay as You Earn (PAYE), workman's compensation and all other official bodies as required by law. This would enable the worker to claim UIF as a means of continuous financial support when the

worker's position on the construction team has either become redundant or once the construction phase comes to an end.

d. Temporary loss of cultivated land

Objective

Minimise the loss of cultivated land, thereby minimising the potential economic loss of income for the farmer.

Targets

- Curbing economic losses on cultivated land as a result of the physical space required for the construction process.
- The rehabilitation of cultivated land to its original standard as it was before the commencement of the construction phase.

Management and mitigation requirements

- The temporary loss of cultivated land should be included in the negotiation process with the landowner.
- The area outside of the dam basin should be rehabilitated to the same condition as prior to the construction activities.

e. Animal- human conflict

Objective

To ensure that animals and people are unharmed during the construction of the proposed dam at the site known as Nwamitwa.

Target

To create awareness among construction works about the dangers of crocodiles and hippos within the Letaba River.

Management and mitigation requirements

- The Contractor must erect signs warning anybody on site of the dangers of crocodiles and hippos.
- Construction workers are to be educated and trained to stay away from dangerous animals. Particular emphasis should be on crocodiles and hippos.

- Construction workers should be restricted to their camp sites at night to prevent encounters with these animals.
- During working hours workers are to remain vigilant of possible hippo or crocodile appearances.
- Swimming and bathing on site, except in specifically provided facilities, is prohibited.

f. Temporary loss of grazing land

Objective

Minimise the loss of grazing land, thereby minimising the potential economic loss of income for the farmer.

Targets

The replacement of grazing land to its original standard outside the dam basin before the commencement of the construction phase.

Management and mitigation requirements

- Mitigation measures should be implemented to avoid any negative impact on animals (e.g. fencing off the construction area).
- Grazing areas outside the dam basin should be rehabilitated to its original grazing conditions to ensure that cattle can continue to graze in the area once they are returned to the area.
- Where the area cannot be rehabilitated to its original condition within a short space of time, DWA or its appointed contractor(s) compensate temporarily in kind rather than financially.

g. Integration with local communities

Objective

Minimise potential conflict and possible health risks between the local residents and the construction workers.

Targets

- Controlled access at the construction village and construction site.
- Empowering local females to reduce their vulnerability.

Management and mitigation requirements

- Raise awareness amongst workers about local traditions and practices;
- Ensure that the local community communicate their expectations of construction workers' behaviour with them.
- To ensure that the local traditions and cultures are respected, local residents should play an active participatory role in the planning process TO BE INCORPORATED IN THE COMMUNICATION STRATEGY AND IMPLEMENTED.

h. Physical splintering

Objective

Ensuring the safety of community members.

Targets

- Providing a safe passageway for community members through or around the site.
- Fencing of areas deemed necessary by the Contractor to be addressed by means of a **Method Statement** to be approved by the Engineer.

Management and mitigation requirements

- Provide a safe passage way for community members to minimise the impact on movement patterns.
- Fence off the construction site to prohibited unauthorised access by community members, thereby placing themselves in potential unnecessary danger.

i. Employment strategy

Objective

Align employment opportunities to the unemployed.

Targets

- Align employment opportunities to the unemployed.

Management and mitigation requirements

j. Exit Strategy

Objective

- To ensure that the withdrawal of workers and the contractors from the site known as Nwamitwa is adequately planned and managed.
- To identify potential impacts (both negative and positive) resulting from the exit of workers and the contractor and develop appropriate mitigation measures.
- To ensure that all the post-construction impacts are adequately addressed.

Target

- Drafting of an Exit Policy document
- Implementation of strategies.

Management and mitigation requirements

- The Contractor should consider preparing an Exit Policy document.

7.2 COMMUNITY CONSULTATION AND DISCLOSURE

7.2.1 Purpose

The community consultation process should ensure an ongoing process of community participation that should run in parallel with the activities during the pre-construction and construction phases. This could be achieved by the formation of a committee to inform and monitor the planning and implementation process.

7.2.2 Components

a) Complaints management.

a. Complaints management

The DWA will identify and maintain open liaison channels to ensure that all queries and/or complaints from affected parties are addressed with the shortest possible delay.

Objectives

- To establish and maintain a system of records which provide full documentation of complaints handling.
- To timeously and effectively address all complaints received.
- 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 28 days of receipt.
- Respond effectively to all complaints received within 28 days, unless additional information and/or clarification are required.

Management and mitigation requirements

The ECO 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 the person responsible for the action was.

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.

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.

The DWA will inform the affected parties in writing of predictable disruptive activities at least 24 hours before hand. This can take place by way of leaflets and must include the contact information for the Engineer and the Contractor. To be included in the DWA Communication Strategy.

7.3 CONSTRUCTION SITE

7.3.1 Purpose

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

7.3.2 Components

The plan is made up of the following components:

a) Establishment of the site office.
b) Signage on site.
c) Ablution facilities.
d) Eating areas.
e) Training and induction of construction staff.

f) Handling and disposal of contaminated water.
g) Hazardous materials storage.
h) Vehicle and equipment refuelling.
i) Water conservation.
j) Contractors Camp and lay down areas.
k) Batching Plants.
l) Roads and Access.
m) Gates and fences.
n) Site closure.

a. Establishment of the site office

Objective

To minimise impacts associated with the establishment, operation and decommissioning of the site office.

Target

Successfully located site office.

Management and mitigation requirements

- The Contractor shall produce a site plan showing the positions of all buildings (e.g. site office and workshops), vehicle wash areas, fuel storage areas, stockpile areas, and other infrastructure, the extent of impact, norms and standards for compliance and rehabilitation standards for the approval of the Engineer prior to the establishment of the site.
- The site office should as far as possible be located in an area which has already been cleared or disturbed by previous human activity.
- Materials, soil stockpile areas, fuels, chemical storage areas, concrete batching areas, and vehicle maintenance areas shall be located away from environmentally sensitive areas and protected from stormwater runoff, fire, and access by unauthorised persons. Inert material should be stored above the 1:20 year flood line, offices above the 1:50 year foodline and all hazardous material and activities above the 1:100 year floodline.
- The placement of buildings and equipment will be done to minimise the footprint and visual impact of the sites.

- Down-lighting will be used at night and the Contractor shall ensure that lighting on site does not interfere with road traffic or cause a reasonably avoidable disturbance to the surrounding community or other users of the area.
- Large (trunk diameter 100 mm or more) indigenous trees within the confines of the site that will be retained are to be adequately protected and indicated on the construction layout maps.
- Vehicles and equipment shall undergo regular maintenance to identify and remedy fuel and oil leaks.
- Appropriate fire suppression equipment and trained personnel shall be available on-site throughout construction activities.
- Locate and clearly indicate convenient access routes, temporary loading and packing areas, and turning circles so that vehicle movement can be confined to these areas.
- Locate temporary waste bins and skips so that they are easily accessible for removal.
- Waste bins and skips shall have lids (refer to Waste Management System Method Statement shall be submitted for approval prior to start of construction). Contractors representative responsible for implementation shall be a registered professional engineer.

b. Signage on site

Objective

To ensure safety of workers and the public.

Targets

- No accidents or loss of life.

Management and mitigation requirements

- Entrances to the construction site must have signs restricting access to the public.
- All entrances to the construction site must have a site layout plan.
- All borrow areas and quarries must be demarcated.
- Access points to all restricted areas (e.g. the batching plant, waste storage and transfer areas, areas where any hazardous substances are stored and lagoons) must be signed indicting the Personal Protective Equipment and training required.
- No under 16 year olds are allowed on site unless in a bus and under the supervision of the Contract Manager.

- The ECO has the right to prescribe any additional signage required.

c. Ablution facilities

Objective

To ensure that where ablution facilities are supplied that the facilities comply with norms and standards.

Targets

- Sufficient ablution facilities supplied at all construction sites.
- Ablution facilities comply with applicable norms and standards.

Management and mitigation requirements

The Contractor must provide ablution facilities for the construction staff. The following should be taken into consideration for the location and management of ablution facilities:

- Ablution facilities provided will include shelter, toilets, and washing facilities.
- Preference should be given to minimising septic tank facilities and optimising above ground effluent management systems, as well as water conservation urinals.
- Toilets will be provided at the preferred ratio of 1 toilet per 15 workers, but not less than 1 toilet per 30 workers.
- Sanitation facilities shall be located within 100 m of any point of work, but not closer than 32 m from any water body.
- Only approved portable chemical toilets will be provided at work areas in residential areas.
- Ablution facilities provided shall be maintained in a hygienic state and serviced regularly to ensure proper operation.
- All spillage shall be reported to the Engineer and in excess of 25 l to the DEA, with immediate remediation.
- The contents of chemical toilets will be removed to an approved disposal site – no discharge into the environment or burying of sewage must be allowed.
- The toilets will be serviced and cleaned on the last construction day before the builder's holiday.
- Personnel washing areas shall be placed and constructed in such a manner so as to ensure that no pollution occurs, including groundwater pollution.

d. Eating areas

Objective

The contractor must ensure that the people working on the project have a safe area to eat their meals.

Target

All people involved in the project are to be well informed of the designated eating areas.

Management and mitigation requirements

- The Contractor shall designate eating areas for all his staff within the Construction Site.
- No eating of meals shall take place outside these designated areas without the approval of the Engineer.
- Waste bins with lids shall be provided and emptied regularly.
- Temporary shade must be provided.

e. Training and induction of staff

Objective

The Contractor must ensure that all people involved in the project (including sub-contractors, visitors, inspectors, casual workers, etc.) are aware of and familiar with the environmental requirements for the project. A register must be kept of all persons accessing the site and their induction training, including date. Training is valid for a period of one year. Prior to site establishment the Contractor must provide a Method Statement demonstrating adequacy of training material and the means of assessing effectiveness (e.g. test).

Target

All people who are involved with the project are aware of the environmental requirements for the project.

Management and mitigation requirements

The Contractor has the responsibility to provide the site foreman with environmental training and to ensure that he 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.
- Possible disturbance to birds, animals, and reptiles, and their respective habitats shall be minimised.
- Construction staff shall be made aware of what possible archaeological or historical objects look like and to notify the ECO if such an object is found.
- Management and minimising of waste.
- Maintenance of equipment to prevent the accidental discharge or spillage of fuel, oil, lubricants, and other chemical.
- Responsible handling of chemicals and spills.
- Emergency procedures and incident reporting.
- Code of Conduct.
- Training must include a written/verbal test.

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.

The Contractor will ensure that construction staff are aware of the following rules:

- No alcohol or drugs are allowed on site.
- 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.
- Cigarette butts will not be disposed of in the bushland or grassland areas.
- Fines shall be implemented for transgressions.

f. Handling and disposal of contaminated 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 stormwater drain, stream or river.
- 100% compliance to relevant standards.

Management and mitigation requirements

- No discharge of pollutants such as cement, concrete, lime, chemicals, fuels, or oils will be allowed into any water resource.
- Grey water from kitchens, showers, and/or sinks shall be discharged in accordance with NEM:WA Waste Regulations and DWA general Discharge Standards.
- Runoff from fuel depots, workshop areas, wash bays, and concrete swills shall be treated as hazardous liquid waste in accordance with the NEMWA Norms and Standards.
- Wash areas shall be placed and constructed in such a manner so as to ensure that no pollution occurs, including groundwater pollution.
- Contaminated water must be stored in accordance with NEMWA Norms and Standards and removed by tanker to a licenced facility.

g. Hazardous materials storage

Objective

To ensure that hazardous materials 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 Low Pressure Gas (LPG). Material Safety Data Sheets (MSDSs) shall be available on site for all hazardous substances to be used on site.

- Materials storage areas will not be allowed in close proximity to ecologically sensitive areas.
- Materials storage areas shall be sited outside the 1:50 year flood line of watercourses.
- Storage areas shall be roofed with impervious material.
- Hazardous chemicals or potentially hazardous chemicals used during construction shall be stored in secondary containers and all relevant MSDSs shall be available on site.
- The relevant emergency procedures relevant to particular chemicals used on site, as per the MSDSs and suppliers guidelines, will be followed in the event of an emergency.
- The contractor shall prevent discharge of any pollutants such as cement, lime, chemicals, fuels, and oils into any water sources and adequate stormwater control measures will be implemented where these substances are handled.
- Explosives storage shall comply with the explosives act.

h. Vehicle and equipment refuelling

Objective

To ensure that vehicle, plant and equipment refuelling is practiced in such a manner that no secondary pollution or emergency situation is created.

Targets

- Storage of flammable material shall be done according to prescribed standards at all times.
- Refuelling of vehicles and equipment shall be done according to prescribed standards at all times.

Management and mitigation requirements

- Fuel (petrol and diesel) may be stored on site provided that the Norms and Standards are complied with.

i. Water conservation

Objective

To minimise water use and maintain sustainability.

Targets

- To ensure regular maintenance of all pipes and taps.
- To ensure water use is kept within allocated water limits.

Management and mitigation requirements

The Contractor will take all practical measures to minimise water use on site and this will include 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 etc. The quantity of water used for construction purposes must be monitored.

j. Contractors construction camp and lay-down areas

Objective

To ensure all lay down areas are allocated designated areas.

Target

To ensure all laydown areas are restricted to designated areas

Management and mitigation requirements

As for site establishment

k. Batching plants

Objective

To assign designated areas for batching plants.

Targets

- To prevent sludge runoff into the natural water system.
- To prevent contamination of the natural water system.

Management and mitigation requirements

- Locate as per site establishment layout plan and waste management requirements.

l. Roads and access

Objective

To prevent traffic congestion.

Target

To ensure all construction vehicles use approved roads.

Management and mitigation requirements

- Develop all permanent and temporary roads and access routes as indicated on the approved site establishment plan and provincial standards and codes of practice.
- Slight deviations of alignment are permitted, so as to avoid significant vegetation specimens and communities, natural features and sites of cultural and historical significance identified by the ECO or Cultural Heritage specialist. These deviations must be approved by the Engineer.
- Minimise the construction of access and haul roads.
- Where construction will obstruct existing access, be sure to allow for alternative temporary access routes.
- Any additional routes and turning areas required by the Contractor must be approved by the Engineer in consultation with the ECO, indicating the position and extent of the proposed route/area.
- Minimise routes through drainage lines and riparian zones wherever possible. Where access through drainage lines and riparian zones is unavoidable construction should be perpendicular to the drainage line. Avoid roads that follow drainage lines within the floodplain.
- Define speed limits at all times on site roads.
- Allow for safe pedestrian crossing where necessary.
- Maintain all access routes and roads adequately in order to minimise erosion and undue surface damage. Repair rutting and potholing and maintain stormwater control mechanisms.
- Runoff from roads must be managed to avoid erosion and pollution.
- Maintain all construction related roads in a functional manner.
- The Engineer will indicate whether or not it is necessary to keep a photographic record of private roads used to access work areas.

m. Gates and fences

Objective

To protect all sensitive areas.

Target

To ensure all sensitive areas or areas of historical significance are fenced and protected.

Management and mitigation requirements

- Repait any damage caused to existing private property, fences and gates.
- Respect the open or closed status of gates for the duration of the construction period.
- Small sensitive areas may be fenced where necessary, as the work site progresses.
- Limit clearing for fencing to the removal of trees and shrubs within 1 m of the fence line. No removal of the grass cover or topsoil is to occur within this width.
- Retain temporary fencing and/or gates in position until replaced by permanent fencing or until the Engineer directs their earlier removal.
- If temporary fencing and or gates are removed temporarily for the execution of any part of the Works then these must be reinstated as soon as practicable by the Contractor.

n. End of Construction Site Closure

Objective

To have an appropriately cleared and rehabilitated site after construction.

Target

- Properly cleared construction site.
- All rehabilitation measures have been implemented successfully.

Management and mitigation measures

In the event of temporary or permanent site closure the Contractor shall check the site, ensure that the items included in a comprehensive site closure checklist to be issued to the Contractor by the Environmental Officer are addressed.

Fuels / flammables / hazardous materials stores

- Fuel stores are as low in volume as practicable.

- There are no leaks.
- The outlet is secure and locked.
- The bund is empty.
- Fire extinguishers are serviced and accessible.
- The area is secure from accidental damage through vehicle collision.
- Emergency and contact numbers are available and displayed.
- There is adequate ventilation in enclosed spaces.
- There are no stores or containers within the 1:50 year flood line.

Safety

- Site safety checks have been carried out in accordance with the Occupational Health and Safety Act (No. 85 of 1993) prior to site closure.
- That there is an inspection schedule and log for use by security or contracts staff.
- All trenches and manholes are secured.
- Applicable notice boards are in place and secured.
- Emergency and Management contact details are prominently displayed.
- Security personnel have been briefed and have the facilities to contact or be contacted by relevant management and emergency personnel.
- Night hazards such as reflectors, lighting, traffic signage etc have been checked.
- Fire hazards identified and the local authority notified of any potential threats e.g. large brush stockpiles, fuels etc.
- Pipe stockpiles are wedged / secured.
- Scaffolds are secure.
- Structures vulnerable to high winds are secured.

Erosion

- Wind and dust mitigation measures are in place.
- Excavated and filled slopes and stockpiles are at a stable angle and capable of accommodating normal expected water flows.
- Re-vegetated areas have a water schedule and the supply to such areas is secured.
- There are sufficient detention ponds or channels in place.

Water contamination and pollution

- Hazardous fuel stores are secure.

- Cement and materials stores are secure.
- Toilets are empty and secured.
- Refuse bins are empty and secured.
- Bunding is clean and treated with appropriate material that will absorb/ breakdown and where possible be designed to encapsulate minor hydrocarbon spillage.
- Drip trays are empty & secure.

7.4 SOLID WASTE MANAGEMENT

7.4.1 Purpose

The inappropriate handling and disposal of solid 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, generated during construction. The general waste management principles of prevent, minimise, recycle or re-use, with disposal as a last option will apply. Only permitted, registered and municipal landfills will be considered as options for disposal of waste. The Contractor must compile a Waste Management Method Statement that identifies the registered professional Engineer that is responsible for the management of waste on the site.

7.4.2 Components

The plan is made up of the following components:

a) Domestic waste.
b) Construction waste.
c) Hazardous waste.

a. Domestic waste

Objective

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

Target

Domestic waste is disposed of at a municipal waste disposal facility.

Management and mitigation requirements

- A refuse control system will be established for the removal of domestic waste.
- The Contractor will ensure that the site is kept clean and tidy at all times.
- Littering will not be allowed on site.
- The excavation and use of rubbish pits on site is forbidden.
- Burning of rubbish is forbidden.

- Timber, metal, oil, paper, bricks, tyres, batteries and any other major recyclable wastes will be stored in safe, secure areas.
- A separate oil container will be used to ensure that oil wastes are contained.
- Maintenance and domestic refuse (e.g. scrap metal, packaging materials, etc) will be collected in appropriate bins for recycling or sent to a landfill site at regular intervals for disposal.
- All chemical drums will be transported to a designated and bunded area when empty before appropriate disposal.
- All vehicles transporting any project related waste must have a tracker installed.
- Certificates of safe disposal must be provided for every load and must include the date and vehicle registration number.

b. Construction waste

Objective

To ensure that construction waste is disposed of at a municipal waste disposal facility.

Targets

- The collection of construction waste will be done daily.
- Construction waste will always be disposed of at a municipal waste disposal facility.
- 100% construction waste disposal record.

Management and mitigation requirements

- Construction waste will be recycled or re-used in the construction process.
- Waste that cannot be re-used or recycled will be disposed of at the nearest appropriate and licensed waste disposal site - disposal records will be kept.
- Waste will not be buried and/or burnt on site.
- A sufficient number of refuse bins that are wind and animal/scavenger proof will be provided.
- Regular clearing and disposal of litter and rubble.
- Where waste is to be transported by truck, it will be covered appropriately.
- All vehicles transporting any project related waste must have a tracker installed.
- Certificates of safe disposal must be provided for every load and must include the date and vehicle registration number.

c. Hazardous waste

Objective

To ensure that hazardous waste, such as bitumen, tar, oil, etc. is disposed at a registered waste disposal facility for toxic/hazardous material.

Target

Hazardous waste will always be disposed of at a registered waste disposal facility for toxic/hazardous material.

Management and mitigation requirements

Oil and lubricant waste management:

- Used oil, lubricants, and cleaning materials from the maintenance of vehicles and machinery shall be collected in a holding tank and sent back to the supplier.
- Water and oil will be separated in an oil trap. 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. Oil collected by a mobile servicing unit will be stored in the service unit's sludge tank and discharged into the safe holding tank for collection by the specialist oil recycling company.
- All used filter materials shall be stored in a secure bin for disposal off site.
- All vehicles transporting any project related waste must have a tracker installed.
- Certificates of safe disposal must be provided for every load and must include the date and vehicle registration number.

7.5 VISUAL/ AESTHETICS

7.5.1 Purpose

There are several general visual mitigating measures which must be applied either during the construction phase or operation phase to prevent/minimise impact on the community.

7.5.2 Components

a) Raising of Tzaneen Dam wall.
b) Visual impact of new dam.

a. Raising of the Tzaneen dam wall

Objective

To decrease visual impacts caused due to the raised dam wall.

Target

To minimise visual impacts caused by the proposed raised dam wall.

Management and mitigation requirements

- Hoarding of construction site facilities to screen views where possible.
- Limit route and duration of large machine activities.

b. Visual impact of new dam

Objective

To decrease visual impacts cause by the proposed dam.

Target

To minimise visual impacts caused by the proposed dam.

Management and mitigation requirements

- Limit areas of invasiveness. The extent of unnecessary damage to natural surrounds must be kept to a minimum.

- Hoarding should be erected to screen the excavation and construction activities where possible as well as to prevent local passers-by from entering an unsafe site. The hoarding should be painted in natural colours or can be constructed out of natural materials, i.e. woven grass / wattle.
- Discourage the unnecessary usage of high voltage lights during through-night construction.
- Utilise existing roads to divert traffic away from construction sites.
- Limit the number and usage of visually intrusive traffic signage.
- All new roads and bridges should mimic the style and visual character of the existing infrastructure.
- All new roads routed through untransformed land should be regarded as least favourable.

7.6 AIR QUALITY

7.6.1 Purpose

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.

7.6.2 Components

a) Truck transport and road dust entrainment.
b) Excavation and Earthworks.
c) Stockpiles and spoil dumps.
d) Vehicle and machinery emissions.
e) Dust on citrus.

a. Truck transport and road dust entrainment

Objective

To avoid exceeding ambient dust levels at the construction sites.

Target

Successfully investigate all exceedances of the ambient dust levels at the defined control point.

Management and mitigation requirements

- Vehicles travelling along the access roads must adhere to speed limits to avoid creating dust.
- A maximum speed limit of 40 km/hr must be adhered to on all site roads.
- Construction camp and haulage road construction areas (these are areas that have been stripped of vegetation) must be dampened to avoid excessive dust.
- Where dust is unavoidable, screening may be required.
- Development a method statement for identified activities that results in exceedance of the ambient dust levels at the control point.

b. Excavation and Earthworks

Objective

To ensure dust emissions are kept to a minimum.

Target

To reduce dust emissions, and to keep within the South African standards.

Management and Mitigation requirements

- Re-vegetate dry, exposed areas to stabilise surfaces.
- Only remove secure covers in small areas and not all at once.
- All activities must be damped down, especially during dry weather.
- Development a method statement for identified activities that results in exceedance of the ambient dust levels at the control point.

c. Stockpiles and Spoil dumps

Objective

To ensure dust particles from stockpiles and spoil dumps are kept to a minimum.

Target

Locate stockpiles in areas least susceptible to heavy winds.

Management and mitigation requirements

- Limit the height and slope of the stockpiles to reduce wind entrainment. For example, a flat shallow stockpile will be subject to less wind turbulence than one with a tall conical shape.
- Keep stockpiles or mounds away from the site boundary, sensitive receptors and watercourses. If necessary, take into account the predominant wind direction to reduce the likelihood of affecting sensitive receptors.
- Make sure the stockpiles are maintained for the shortest possible time.
- Seed, re-vegetate or turf long term stockpiles to stabilise surfaces or use surface binding agents
- Erect fences of similar height and size to the stockpile to act as wind barriers and keep these clean using wet methods. Porous fences or hedges often make the most suitable shelter.
- Development a method statement for identified activities that results in exceedance of the ambient dust levels at the control point.

d. Vehicle and machinery emissions

Objective

To ensure that vehicle and machinery emissions comply to acceptable norms and standards.

Target

- All construction vehicles and machinery emissions will be screened on a weekly basis.
- All construction vehicles and machinery will be serviced on a monthly basis, with a major service every six month.
- Any construction vehicle or machine that does not comply with the emission standard shall immediately be withdrawn from service.
- Complaints received regarding emissions from construction vehicles or machinery shall immediately be attended to.

Management and mitigation requirements

- Service construction vehicles and machinery on a monthly basis, with a major service every six months.
- The contractor shall inspect all construction vehicles and machinery every morning for defects (indicator lights, oil leaks, etc) and excessive emissions.
- Vehicle emissions shall be tested as per the described methods and standards every week.
- All vehicles not complying to the specified standard shall be removed from service.
- All complaints received pertaining to construction vehicle emissions shall be recorded as well as the actions taken to rectify the situation.

e. Dust on Citrus

Objective

To avoid exceeding ambient dust levels at the construction sites.

Target

Successfully investigate all exceedances of the ambient dust levels at the defined control point.

Management and Mitigation

- Vehicles travelling along the access roads must adhere to speed limits to avoid creating dust, with particular emphasis around citrus areas.
- A maximum speed limit of 40 km/hr must be adhered to on all site roads.
- Where dust is unavoidable, screening may be required.
- Development a method statement for identified activities that results in exceedance of the ambient dust levels at the control point.
- Acceptable levels of dust for citrus must be determined and measured at the closest orchards (which will be in the dam basin).

7.7 NOISE CONTROL

7.7.1 Purpose

There is 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. The requirements apply to all of the construction areas of the project.

7.7.2 Components

a) General noise mitigation.
b) Noise from the plant and machinery.
c) Noise from blasting.
d) Noise from vehicles.

a. General Noise Mitigation

Objective

To minimise noise levels.

Target

To ensure noisy operations are restricted to day time hours.

Management and mitigation requirements

- The induced ambient noise levels in the residential areas of Ka-Malubana Village shall not exceed 50dBA during the day and 40dBA at night.
- Noisy operations should be combined so that they occur where possible at the same time.
- Construction activities are to be contained to working hours during the day and early evening. Night-time activities near noise sensitive areas should be avoided wherever possible.
- Deliveries of material and any noisy offloading activities should be restricted to the day.
- With regard to unavoidable very noisy construction activities in the vicinity of noise sensitive areas, the contractor should liase with local residents on how best

to minimise impact, and the local population should be kept informed of the nature and duration of intended activities.

- 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.
- Given that construction activities will expose workers to excessive noise rating levels it is recommended that a baseline noise survey also be conducted as soon as possible following commencement of site activities. This noise survey will quantify worker exposures to noise during typical activities and allow for informed comment on the relative risks to hearing presented by various activities – i.e. identify sources of excessive noise and allow for demarcation of noise zones. A formal noise survey will also permit structuring of an appropriate audiometric examination protocol for construction workers – as required by the Noise Induced Hearing Loss Regulations – OHSA Act 85 of 1993.

b. Noise from the plant and machinery

Objective

To minimise noise emanating from the construction activities, this may be a nuisance to the surrounding residential areas.

Target

To ensure noise machinery are located away form sensitive areas.

Management and mitigation requirements

Construction site yards, concrete batching plants, asphalt batching plants, construction worker camps and other noisy fixed facilities should be located well away from noise sensitive areas. Once the proposed final layouts are made available by the contractor(s), the sites must be evaluated in detail and specific measures designed in to the system.

c. Noise from Blasting

Objective

To ensure noise levels are kept to a minimum during blasting.

Target

To ensure blasting is restricted to daytime hours.

Management and mitigation requirements

Blasting operations are to be strictly controlled with regard to the size of explosive charge in order to minimise noise and air blast, and timings of explosions. The number of blasts per day should be limited, blasting should be undertaken at the same times each day and no blasting should be allowed at night.

d. Noise from Vehicles

Objective

To minimise noise levels caused by construction vehicles

Target

To ensure compliance with requirements of the Occupational Health and Safety Act (Act No 85 of 1993).

Management and mitigation requirements

- All construction vehicles, plant and equipment are to be kept in good repair.
- Truck traffic should be routed away from noise sensitive areas, where possible.

7.8 TRAFFIC

7.8.1 Purpose

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.

7.8.2 Components

a) Additional turning lanes.
b) Construction signage.
c) Traffic movement of construction vehicles.

a. Additional turning lanes

Objective

The objective is to maintain a good level of service at the access intersection to the constructing sites and the borrow pits.

Target

The target is to ensure safety and to minimise delays for the general traffic on the affected roads. SANRAL or the provincial road agency standards must be adhered to.

Management and mitigation requirements

Due to the increased activity of heavy construction vehicles on the roads network it is proposed that turning lanes are provided to minimise the conflict points with the general road users. These turning lanes should to be at the intersections with the access roads to borrow pits and construction sites. These will be permanent on access roads maintained after construction.

b. Construction signage

Objective

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

Target

The target is to ensure road safety along the public roads and onsite and to increase awareness of slow moving vehicles.

Management and mitigation requirements

- Signage warning of the dangers of hippos and crocodiles must be erected.
- Due to the public nature of the roads it is recommended that adequate construction signage is in place to inform the public of increased construction activities in the affected areas by placing adequate signage.
- Traffic signs should warn construction vehicles of the presence of pedestrians and school children along the road. Likewise, traffic signs should warn community road users of the presence of construction vehicles.

c. 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

- All vehicle drivers entering the construction camp must pass a breathalyzer test.
- Random drug testing may be undertaken on site.
- The maximum speed limit for all vehicles on site shall be 40 km / hour.
- All parking must be reverse parking.
- When a road on site is within 10 m of a drop of 1 ½ m or more, it must have a guard rail.
- Access roads must not have obstructed views so that vehicles are always visible.
- Construction traffic should only make use of approved routes.
- The number of trucks that pass through communities should be kept to a minimum.

- The Engineer shall prepare a method statement that will consider alternatives to transporting goods through towns for haulage of high volume construction material.
- Implement traffic flow controls where road closure or partial road closure is unavoidable. This can either be in the form of providing alternative access routes via detours and/or the use of 1-way traffic flow control.
- In the event of 1-way traffic flow control, trained personnel should be used to regulate the traffic to prevent severe delays at waiting points.

7.9 WATER MANAGEMENT

7.9.1 Purpose

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 Contractor must compile a Water Management Method Statement to be approved by the Engineer that includes monitoring and reporting mechanisms that cover all water abstractions from the river or any other water source, waste discharge, soil erosion and water quality aspects.

7.9.2 Components

a) Stormwater runoff and discharge.
b) Erosion protection.
c) Floodlines.
d) Proximity to rivers, streams and/or wetlands.
e) Water abstracted from river and streams.
f) River crossings / alteration of water courses.
g) Pollution control.

a. Stormwater runoff and discharge

Objectives

To ensure that stormwater runoff and discharge are effectively controlled.

Targets

- No flooding as a result of stormwater control measures.
- No erosion as a result of stormwater control measures.
- No silt pollution as a result of stormwater control measures.

Management and mitigation requirements

- Suitable means for the control and disposal of accumulated stormwater which may run off from any earthworks, building or paving shall be provided.
- The disposal of stormwater to any street surface shall first be confirmed with the Local Authority that adequate capacity is available.
- No stormwater shall be allowed to enter any drainage installation.

b. Erosion protection

Objectives

To ensure that all stormwater outlets are protected against erosion.

Targets

No erosion channel formation as a result of stormwater outlets.

Management and mitigation requirements

- Identified areas where erosion could occur must be appropriately protected by installing the necessary temporary and/or permanent drainage works as soon as possible and by taking other appropriate measures to prevent water from being concentrated in rivers/streams and from scouring slopes, banks or other areas.
- Any erosion channels which develop during the construction period must be suitably backfilled, compacted and restored to a proper condition (i.e. vegetated etc.).
- Where excavation takes place, the affected area should be properly stabilised and revegetated to minimise erosion risk.
- Appropriate mitigation to control sediment input into rivers will be required during construction.
- Stormwater control measures must, amongst others, consider and provide for the following:
    - use of siltscreens;
    - use of straw bales as filters, which are placed across the flow of overland stormwater overlays:
    - channelling stormwater run-off through natural grassland buffer areas (at least 20m);
    - silting of stormwater pipes in adjoining developments and townships as a result of run-off from the rail reserve shall not be permitted. If this does

occur, it shall be the responsibility of the concessionaire to clean out the pipes to the satisfaction of the relevant municipality;

- gabions or stormwater control structures should be used to disperse stormwater flows and/or prevent and control erosion where necessary along rivers or streams;
- in the case of high volumes of stormwater flow, retention ponds must be provided;
- all erosion protection measures have to be maintained on a continual basis;
- corrective actions have to be taken as and when required to stop any signs of erosion;
- regular inspections by competent personnel need to be undertaken at especially:
  - inlet and outlet points of drainage structures,
  - stormwater release points, and
  - along sections where drainage structures are laid on steep slopes.
- Where possible, stormwater should be released in grassy areas which act as a natural filter and to reduce the erosion potential of the water.
- The stabilization of headcuts during the construction phase to prevent erosion and sedimentation will be undertaken through various methods to limit or eliminate erosion and sedimentation i.e. gabions, rock packing, vegetation establishment, bales and poles, vegetation sausages and top soil simulation.

c. Floodlines

Objectives

To ensure that no construction activities take place within predetermined floodlines.

Targets

- Determine the 1:20, 1:50 and 1:100 floodlines for all rivers and streams at which construction activities will take place.
- Draw maps with an appropriate scale to show all construction activities in relation to the 1:20, 1:50 and 1:100 floodlines.
- No unauthorised activities within the 1:100 year floodline.
- Where possible construction activities should only take place during low flow periods when as little of the construction site and exposed sediment is in contact with the flow as possible.

Management and mitigation requirements

Floodlines (1:20, 1:50 and 1:100 year) should be determined prior to construction to ensure risks are adequately managed. These must also be clearly indicated on the layout plans.

d. Proximity to rivers, streams and/or wetlands

Objectives

To ensure that construction activities close to rivers, streams and / or wetlands do not negatively affect rivers, streams and / or wetlands.

Targets

- No impact on riparian vegetation.
- No impact on wetland vegetation.
- No silt pollution in rivers and streams as a result of construction activities.

Management and mitigation requirements

- Where appropriate, large individual indigenous riparian trees should be avoided during construction and should be marked on site.
- Appropriate design and mitigation measures must be developed to prevent impacts on the natural flow regime of the water courses i.e. through placement of structures/support.
- If this is not possible, measures must be developed to minimise impacts on surface water i.e. erosion, siltation, pollution etc.
- The proximity of construction activities in relation to springs, wetlands and streams shall be clearly shown on a map with a 1:10 000 scale.
- A wetland professional shall be appointed to confirm the extent of wetlands through soil sampling.
- No construction activities shall take place within any wetland boundary.
- All construction activities shall be 50 meters from the edge of any river/stream or outside the 1:20 year floodline, whichever is the greatest.
- Pollutants collected will be stored in sealed drums for recycling.
- A water quality and quantity monitoring plan shall be developed and implemented.

- This plan shall include monitoring points, frequency of samples, and variables that should be analysed.

e. Water abstracted from river and streams

Objectives

To obtain authorisation for water abstraction and to minimise impacts to the aquatic and riverine ecosystems.

Targets

- Obtain all authorisations in terms of Section 21 of the National Water Act (No.36 of 1998).
- No surface run-off of oils, cement, litter, paints etc. which could pollute nearby streams and rivers.

Management and mitigation requirements

- Any abstraction of water for construction purposes must be approved by DWA.
- Prevention and mitigation measures must be implemented to ensure water quality is not adversely affected by such abstraction.

f. River crossings / alteration of water courses

Objectives

To prevent and mitigate disturbance and change to the riparian zones and instream habitats of rivers and streams during construction of water course crossings.

Targets

- No impact on riparian vegetation.
- No impact on wetland vegetation.
- No silt pollution in rivers and stream as a result of construction activities.

Management and mitigation requirements

- All construction roads in or adjacent to the riparian zone should be aligned and managed so as to minimise disturbance of the riparian zone and instream habitats.

- For natural watercourses, the original geometry, topography and geomorphology in both cross-sectional and longitudinal profile should be reinstated at above or below river crossings.
- For controlling sediment input into any rivers, streams or wetland the use of hay bales packed in rows across diversions and active flow areas could limit sedimentation inputs and buffer the pH:
  - such bales will need to be removed and disposed of after construction;
  - other alternative methods for controlling sediment should also be considered;
  - all coffer dams, causeway and construction materials should be removed from the river and riparian zone immediately after construction at the site is completed;
  - disturbed areas of the riparian zone should be re-vegetated using either a specified seed mix and/or appropriate indigenous trees where necessary and according to slope and risks in terms of bank erosion along the rivers or streams;
  - ripping and discing of temporary access and construction roads in the riparian zone should be undertaken in order to assist with natural vegetation re-establishment and the control of bank erosion;
  - large individual indigenous riparian trees should be avoided during construction where appropriate.
- The mitigatory methods should be audited during construction, and monitored for a period thereafter, until full rehabilitation is assured and stability demonstrated.

g. Pollution control

Objectives

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

Targets

- The results of samples taken of the river shall show no deterioration in water quality from the background water quality.
- All incidents shall be reported to the relevant office of the Department of Water Affairs.
- No complaints regarding water pollution.

Management and mitigation requirements

- Storage, handling and disposal of fuels, oils, lubricants and other potentially harmful chemicals (and their containers) shall be done under proper supervision in accordance with the manufacturer's instructions.
- Containers that contained toxic or harmful materials shall not be rinsed and re-used.
- Such containers shall not be stored or disposed on site. These containers shall be destroyed to prevent re-use and disposed in accordance with the manufacturers instructions at a permitted waste disposal facility.
- Certificates of safe disposal shall be kept on record.
- Discharges of liquid waste shall under no circumstances be allowed.
- Where pollution of a water body may potentially occur, the contractor shall ensure adequate measures (e.g. containment, drainage diversion systems, attenuation, settlement dams, and oil absorbent products) are in place to prevent pollution.
- Areas where cement is mixed and containers washed shall be confined to a minimum sized area, which is bunded, so that contaminated runoff is contained.
- Any spillages of pollutants, irrespective of size, shall be contained and cleaned immediately.

7.10 AQUATIC ECOSYSTEMS

7.10.1 Purpose

Construction activities inherently have the ability to negatively impact on aquatic ecology and riparian vegetation. The following mitigation measures will help to ensure that the negative impacts can be avoided or adequately mitigated.

7.10.2 Components

a) Removal of riparian vegetation.
b) Reinforcement and protection of the downstream banks and streambed.
c) Drainage of all farm dams within the dam basin.
d) Dam basin clearing.

a. Removal of riparian vegetation

Objective

- To maintain aquatic habitats at the proposed dam.
- To ensure riverine habitats are maintained during dam basin clearance.

Target

- To prevent impact on the river system during vegetation removal.
- To ensure riparian habitats are maintained during dam clearance.

Management and mitigation requirements

- Phased removal of vegetation, limiting the amount of exposed areas and confining the majority of disturbances to the dry season.
- Translocation of red data or riparian plant species to alternative sites.
- Accurate floodline calculation.
- Prevent exotic vegetation encroachment.
- Adequate provision of inundated habitats for fish and aquatic macro invertebrates must be provided for or remain, which will not decay quickly or disrupt the physical or chemical characteristics of the water.

b. Reinforcement and protection of downstream banks and streambed

Objective

To ensure that the river banks are protected against erosion.

Targets

- To prevent erosion of the river banks.
- To stabilise the riverbanks and beds.

Management and mitigation requirements

Adequate strategies must be implemented for the reinforcement and protection of the downstream banks and streambed so as to stabilise and reduce erosion of the banks and bed. In addition to riparian vegetation rehabilitation, engineered structures must be put in place to reduce the turbulence and velocities of discharged waters.

c. Drainage of all farm dams within the dam basin

Objective

To ensure that the Letaba river system remains genetically pure.

Target

To prevent exotic fish from entering into the Letaba river system.

Management and Mitigation Requirements

All farm dams within the dam basin of the proposed new dam must be thoroughly drained, well before the closure of the proposed dam at the site known as Nwamitwa and checks must be made by the Limpopo Provincial Department of Agriculture to ensure that no pools of water containing fish are left behind.

d. Dam basin clearing

Objective

Maintain water quality in a state that does not impact on use, including ecological.

Target

Current and future water quality indicates that clearing of the orchards and trees/bushveld from the dam basin prior to impoundment is recommended.

Management and Mitigation Requirement

- Vegetation clearing must include trees and bushes, and exclude grass. Identified very large trees may be left.
- The roots of plants should not be removed, but plants should rather be cut down close to ground level with a chain-saw.
- Topsoil should not be disturbed.
- Non-commercial material to be removed should be burned in a hot fire in order to minimise air quality impacts. This can be achieved by stacking the material in rows and burning on a windy day.
- The areas of the basin that are cleared/ not cleared should be marked on a map for future use.

7.11 NATURAL MATERIALS SOURCING, AND EARTHWORKS/ STOCKPILES

7.11.1 Purpose

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

7.11.2 Components

The plan is made up of the following components:

a) Materials sourcing.
b) Earthworks /stockpiles.

a. Materials sourcing

Objectives

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

Targets

100% record of the source of all materials.

Management and mitigation requirements

The Contractor will prepare a source statement to indicate the sources of all materials (including topsoil, sand, natural gravel, stone, asphalt, etc.) and submit these to the Engineer for approval, which must include sources from commercial suppliers.

b. Earthworks/ Stockpiles

Objectives

To ensure that material stockpiled does not negatively impact on the surrounding environment.

Targets

Stockpiles are constructed and maintained appropriately.

Management and mitigation requirements

During the life of the stockpiles, the following measures will be taken:

- Stockpiles will be positioned and sloped to create the least visual impact.

- Stockpiles will not be allowed underneath trees or against the trunks of trees.
- Stockpiles will be constructed and maintained to avoid erosion of the material and contamination of the surrounding environment.
- Stockpiles will be kept free of all alien vegetation.
- The heights of stockpiles should be minimised as far as possible to reduce wind entrainment and stockpiles should be located as far away from sensitive receptors as possible
- Windbreaks should be erected around stockpiles where possible in order to reduce wind entrainment of dust emissions

Once stockpiles have been removed, the following measures will be taken:

- The site will be re-instated to its original condition.
- No foreign material generated and/or deposited during construction will remain on the site.

7.12 TOPSOIL MANAGEMENT

7.12.1 Purpose

To ensure that topsoil is suitably stored for the subsequent use in the rehabilitation and re-vegetation of the site.

7.12.2 Components

Prior to site establishment and any earthmoving operations, the Contractor will strip and stockpile all topsoil within the footprint of the construction activities.

a) Topsoil stripping.
b) Topsoil stockpiling.
c) Topsoil storage.

a. Topsoil stripping

Objective

To ensure topsoil is removed for subsequent use and re-vegetation.

Target

To ensure vegetation is removed for subsequent use and rehabilitation.

Management and mitigation requirements

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.

b. Topsoil stockpiling

Objective

To stockpile topsoil for the subsequent use in the rehabilitation and re-vegetation of the site.

Target

To retain the usefulness of topsoil for the rehabilitation of the site.

Management and mitigation requirements

- All topsoil shall be stockpiled separately from subsoil and/or rocky material.

- No imported topsoil will be used as the final backfill layer.
- Stockpiles will be located away from rivers, stream, drainage lines, and areas of temporary or permanent inundation.
- Topsoil stockpiles shall be convex and shall not exceed 3 metres in height.

c. Topsoil storage

Objectives

To ensure topsoil is stored in a manner to allow re-vegetation later.

Targets

To ensure topsoil is stored in an adequate manner for re-use.

Management and mitigation requirements

- Topsoil must not be stored in or near sensitive areas.
- Stockpiled topsoil shall not be compacted.
- The Contractor will implement measures to prevent topsoil form being blown away or washed away.

7.13 SPOIL MANAGEMENT

7.13.1 Purpose

The purpose of the spoil (excavated subsoil) management plan is to ensure that spoil is stockpiled, transported and disposal in an appropriate manner.

7.13.2 Components

The plan is made up of the following components:

a) Locating spoil disposal sites.
b) Transporting spoil.

a. Locating spoil disposal sites

Objectives

- To ensure that social and environmental requirements are taken into consideration for the siting of the spoil stockpiles.
- To ensure that spoil is disposed of in an environmentally friendly manner complying with all regulatory requirements.

Targets

To prevent negative impacts occurring during disposal of spoil material.

Management and mitigation requirements

- The contractor will identify candidate spoil stockpile sites for use during construction.
- Spoil stockpiles shall be located away from seepage zones, flood lines, water resources and other ecologically sensitive areas and not within the 1:20 year floodline, or within a horizontal distances of 50m (whichever is greater) of a water course, drainage line or identified wetland.
- The contractor will estimate spoil volumes to be accommodated at potential sites by modelling the dump size, layout and form.
- The contractor shall develop a spoil stockpile plan, which will include the following :
    - Estimate size of stockpiles;

  - Means of erosion (wind and water) prevention measures;
  - Measures to prevent spoil dump contamination, vehicular and public access.
- Spoil stockpiles shall be sufficiently located away from seepage zones, flood lines, water courses and other ecologically sensitive areas.
- Stockpiles shall not have slopes steeper than 1 vertical: 2.5 horizontal.
- Spoil stockpiles should be protected with appropriate soil conservation measures from wind and water erosion. Depending on local conditions, such measures could include:
  - regular watering;
  - erosion control fabric; and
  - grass seeding.
- No waste, such as construction waste, building rubble and domestic waste will be allowed on the spoil stockpiles.
- Spoil stockpiles will be cleared of any alien vegetation.
- Stockpiles will not be allowed underneath trees or against the trucks of trees.
- Avoid spoil handling and dumping in windy or excessively rainy conditions.

b. Transporting of spoil

Objectives

To ensure that spoil is transported from the site of origin to the disposal site in a manner that will not create negative impacts.

Target

No complaints received from residents and road users regarding dust from spoil transport vehicles.

Management and mitigation requirements

- Vehicles should be routed away from noise sensitive areas wherever possible.
- In built up areas a speed limit of 40km/h for heavy vehicles will be strictly enforced.
- Vehicles transporting spoil material must be covered or soil sprayed with water before leaving site if transportation is required in excessively windy conditions at the discretion of the ECO.

7.14 FAUNA AND FLORA

7.14.1 Purpose

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.

7.14.2 Components

a) Protection of ecologically sensitive areas/ habitats and endangered fauna and flora.
b) Weeds and alien vegetation.
c) Rare and protected species.
d) Firewall regimes.

a. Protection of ecologically sensitive areas/habitats and endangered fauna and flora

Objective

- To minimise transformation and fragmentation of habitat for fauna and flora; and
- To minimise harvesting pressure on vegetation at the proposed new dam site

Targets

- Maintenance of viable corridors of natural habitat in the project area.
- Minimise impact on natural vegetation.
- Maintenance of vegetation in natural condition surrounding infrastructure.
- Maintenance of vegetation in natural condition surrounding infrastructure.
- Prevent unnecessary removal of vegetation.
- Ensure as little disruption to animals as possible.

Management and mitigation requirements

- Areas cleared for temporary work outside of the future dam full supply level shall be stabilised as soon as possible.

- The trapping and relocation of targeted threatened, endemic and protected species, particularly small mammals and reptiles should be detailed in a method statement before filling of the proposed dam commences.
- Construction teams should not be allowed access to areas of untransformed vegetation where opportunities for poaching may be present. Penalties should be levied on any construction teams that transgress and poachers should be prosecuted under relevant provincial legislation.

b. Weeds and alien vegetation

Objective

To minimise invasion of alien plants at both Tzaneen dam and the proposed dam at the site known as Nwamitwa.

Targets

Maintenance of vegetation in natural conditions and surrounding infrastructure.

Management and mitigation requirements

- Restrict development footprint to absolute minimum area necessary.
- Rehabilitate disturbed sites through ripping of soil surface with a seed mix of relevant indigenous grasses appropriate to the specific area.

c. Rare and protected species

Objectives

- To minimise loss of individuals of rare and protected beetle species.
- To minimise loss of protected scorpion and baboon spider species.

Targets

- Viable populations of *Dromica oberprieleri* and *Megacephala regalis vansoni*, as well as other protected beetle species, remain after completion of construction activities.
- No impacts on populations of Flat Rock Scorpions (*Hadogenes troglodytes*) and minimal loss of individuals of protected baboon spiders and other protected scorpion species including *Opistophthalmus glabrifrons* and *Opistacanthus asper.*

Management and mitigation requirements

- Filling of Nwamitwa Dam, if approved, should be done and as far as possible within the adult activity period of *Dromica oberprieleri* (October - January).
- Pipeline and reservoir construction should avoid areas suitable as habitat for *H. troglodytes*, area disturbed during construction should be minimised as far as is feasible so as to reduce impacts on baboon spiders and other scorpion species.
- An appropriate invertebrate biodiversity-monitoring programme, for which baseline assessments of selected indicator taxa (e.g. *Dromica spp*.) must be undertaken prior to any development of the site.

d. Maintenance of firewall regimes

Objective

To minimise disruption of the natural fire regime on either side of the proposed dam.

Targets

Maintenance of equivalent fire regimes on both sides of the dam.

Management and mitigation requirements

Burns on both sides of dam should take place at similar frequency and at similar times.

7.15 HERITAGE

7.15.1 Purpose

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. Those sites that are not impacted on can be written into the management plan; hence they can be avoided or cared for in the future.

7.15.2 Components

a) Protected heritage sites.
b) Chance heritage finds.

a. Protected heritage sites

Objective

Protection of archaeological, historical and any other site or land considered being of cultural value within the project boundary against vandalism, destruction and theft.

Target

- To avoid disturbing sites of heritage importance.
- To avoid disturbing burial sites.

Management and mitigation requirements

- Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site.
- Contractors and workers should be briefed on the locations of the existing heritage sites within the construction areas.

b. Chance heritage finds

Objective

To ensure heritage sites discovered 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). Should these be discovered during construction.

Management and mitigation requirements

- The contractors and workers should be notified that archaeological sites might be exposed during the construction work.
- Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the ECO shall be notified as soon as possible.
- All discoveries shall be reported immediately to a museum, preferably one at which an archaeologist is available, 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;
- Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51. (1).

7.16 HEALTH AND SAFETY

7.16.1 Purpose

Construction activities inherently have the potential to impact on the health of the construction workers and the community. This management plan ensures that the community are made aware of the health implications and mitigation measures that would prevent or minimise the impacts caused.

7.16.2 Components

a) Disaster management plan.
b) Safety of construction workers.
c) Construction related illnesses.

a. Disaster management

Objective

Ensuring the health and safety of construction workers on site.

Targets

- Trained first aid workers on site.
- Standard operating procedure in the case of an emergency.

Management and mitigation requirements

- Develop and implement a disaster management plan for implementation during the construction phase.
- Identify suitable individuals that can be trained and used as first aid officers on site (levels 1 to 3). Training of these individuals should ideally take place during this phase of the project to ensure that qualified first aid officers are on site once construction commences.
- Consult with private ambulance services and/or hospitals so that they are aware of the project and would be able to provide emergency and/or medical services if needed.

b. Safety of construction workers

Construction workers health and safety in terms of their working conditions will be managed inline with the requirements of the Occupational Health and Safety Act (Act No 85 of 1993).

c. Construction related illnesses

Objective

To ensure that construction workers are informed of all construction related health risks.

Target

Ensure all workers are educated on the symptoms off all possible construction related illnesses.

Management and mitigation requirements

- All contractors are to conduct a baseline risk assessment prior to performing any construction activities. This risk assessment must identify and evaluate all of the risks to the health and safety of persons engaging in construction activities. Focus illnesses should be on malaria, diarrhoeal disease, and sexually transmitted diseases.
- All construction workers should be subject to baseline (pre-employment) medical examinations. The structure of these examinations should be at the discretion of a registered Occupational Medical Practitioner.
- All workers are to have easy access to drinking water;
- All equipment is to be maintained according to their design specifications to prevent vibration stress;
- All defective or broken equipment and vehicles are to be removed from site until they are repaired;
- All staff is to be educated on the impacts and symptoms of vibration stress.
- Issuing appropriate personal protective equipment (brimmed hats or peaked caps) and enforcing the use of such PPE.
- Educating workers in ways and means of preventing malaria is also recommended. Priority should be given to ensuring that workers are aware of the benefits of:

- Limiting time out of doors after dark
- Wearing long sleeved shirts and long trousers after dark
- Making use of insect repellents
- Closing windows and doors of sleeping quarters at night

- Education and training of workers in ways and means of reducing their risks of diarrhoeal disease infection – i.e:
  - Avoid swimming or bathing in uncontrolled water sources
  - Avoiding drinking water from uncontrolled or unknown sources
  - Avoid urinating in water sources / courses
  - Follow good personal hygiene practices (washing hands etc)
  - Avoid eating food from unknown or suspect sources
  - Avoid raw or undercooked foods.

7.17 SITE REHABILITATION

7.17.1 Purpose

The purpose of the rehabilitation management plan is to successfully address, control, and mitigate the long-term well-being of the environment.

7.17.2 Components

a) Disturbed areas to be rehabilitated.
b) Re-vegetation of disturbed areas.
c) Sourcing of materials from borrow pits and blasting areas.
d) Maintenance of rehabilitative measures.
e) Rehabilitation of marginal vegetation.

a. Disturbed areas to be rehabilitated

Objective

To ensure all areas disturbed during construction footprint are rehabilitated to its natural state.

Target

To ensure all debri is removed from the site and rehabilitated.

Management and mitigation requirements

- Clear the site of all inert waste and rubble, including surplus rock, foundations and batching plant aggregates. After the material has been removed, the site shall be re-instated and rehabilitated.
- Load and haul excess spoil and inert rubble to fill in borrow pits/dongas or to dump sites indicated/approved by the ECO.
- Subject to approval by the Engineer in consultation with the ECO, certain borrow pits and/or quarries may be utilised for the disposal of waste rock and inert building rubble.
- Remove from site all domestic waste and dispose of in the approved manner at a municipal waste disposal site.

b. Re-vegetation of disturbed areas

Objective

To ensure natural habitats are maintained.

Target

- Removal of invasive alien plants
- Re-vegetation in a correct manner to encourage growth.

Management and mitigation requirements

- All planting work is to be undertaken by suitably experienced personnel, making use of the appropriate equipment.
- Planting should preferably be done during the rainy season.
- If impenetrable shale, rock, clay or a high water table is encountered, making the above hole sizes impossible, then seek advice from the Engineer.
- 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 and backfilling with approved plant medium mixture.
- 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).
- Water aloes and bulbs once, directly after transplanting to settle the soil.

- Remove stakes and wire binds over time as required, as plants become established

c. Sourcing of material from borrow pits and blasting areas

Objective

To ensure disturbed areas are rehabilitated.

Target

- To make safe all borrow pit and excavation areas.
- To make safe all blasting areas.

Management and mitigation requirements

- Make safe all borrow pits, quarries and dangerous excavations by backfilling, grading and blasting as required.
- All soft material side slopes should be made up to a final layer with topsoil and re-vegetated to 1:3 meters.
- All weathered or hard rock slopes should be made up to a final layer of a 2 meters step every five meters, fenced off and allow for free draining.
- Programme the backfill of excavations so that subsoil is deposited first, followed by the topsoil. Compact in layers for best results.
- Backfill French drains, sludge dams and evaporation dams and compact, covering with a final layer of topsoil to a height of 100 mm above the surrounding ground surface.
- Deficiency of backfill may not be made up by excavating haphazardly within the Work Site.
- Monitor backfilled areas for subsidence (as the backfill settles) and fill depressions using available material.
- Dismantle and flatten temporary drifts and river crossings, reinstating all drainage lines to approximate their original profile.
- Shape all disturbed areas to blend in with the surrounding landscape.
- Ensure that no excavated material or stockpiles are left on site and that all material remaining after backfill is smoothed over to blend in with the surrounding landscape.

- Blasting areas should be left as rough as possible to facilitate the establishment of vegetation.

d. Maintenance of rehabilitative measures

Objective

To ensure all disturbed areas are rehabilitated.

Target

Compliance of the mitigation requirements.

Management and mitigation requirements

- 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.
- Revegetation must match the vegetation type, which previously existed, unless otherwise indicated in the Contract or specified by the Engineer.
- Base the new carrying capacity of rehabilitated land on the status quo rather than the regional estimate.
- Control invasive plant species and weeds by means of extraction, cutting or other approved methods.

e. Rehabilitation of marginal vegetation

Objectives

To rehabilitate disturbed areas to their former state.

Targets

Full compliance of the rehabilitation plan.

Management and mitigation requirements

The contractor shall prepare a rehabilitation plan for acceptance by the Engineer prior to commencement of the rehabilitation work. This plan will detail, amongst other, the following:

- The Contractor shall remove all visible weeds from the placement area and from the topsoil before replacing the topsoil.

- Topsoiling 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.
- Where sodding is required, light scarification shall be carried out to contain the sods.
- Monitoring of revegetated areas every 3 months during the first year and twice a year thereafter for coverage and exotic weeds and invader species.
- Revegetated areas showing less than 30 % coverage after one growing season shall be prepared and revegetated from scratch.
- Repair of any damage to revegetated areas to maintain coverage.
- 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 revegetation.
- Prior to initiating the rehabilitation programme, the Contractor will remove all remnants of building materials, concrete foundations, timber, and other debris from the site.
- Suitable, area-specific and naturally occurring rooted trees and grasses must be planted within a determined buffer zone within the dam basin so as to reduce the input of sediments and pollutants into the dam via runoff.
- Suitable, area-specific and naturally occurring riparian vegetation must be rehabilitated or restored downstream of the dam so as to aid in bank stability and erosion control.

7.18 MONITORING

7.18.1 Purpose

A series of environmental variables are to be monitored during the construction phase to ensure compliance with the relevant legislation.

7.18.2 Components

a) Noise monitoring.
b) Air quality monitoring.
c) Water quality monitoring.
d) Aquatic life monitoring.

a. Noise monitoring

Objective

Ensure noise generating activities are located away from sensitive areas.

Target

Ensure compliance with the National Noise Control Regulations and SANS 10103:2004 guidelines.

Monitoring Methods

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 (Act No 85 of 1993). Regular monitoring during high construction activities need to be conducted.

b. Air Quality Monitoring

Objective

To prevent impact caused by dust emissions on communities and receiving environment.

Target

- To determine the source of the emissions, the directly and the impact on the receiving environment though source based performance indicators.
- To install a dust fallout monitoring network before the construction phase begins.

Monitoring methods

- An air quality (dust) management method statement must be submitted for approval of the Engineer prior to being implemented when physical work commences on site.
- A dust fallout network comprising of ~3 single dust fallout buckets is recommended. The proposed locations of the dust buckets are indicated in Figure 9.1 of **Annexure F** of the EIR and are selected in terms of maximum zones of impact due to the construction activities, with the additional aspect of exposure potential.
- Continuous PM_{10} monitoring, as this provides real-time data which reflects instantaneous peaks, diurnal and nocturnal trends and seasonal variation, should take place highly sensitive receptors. The PM_{10} data analysis must include comparison to local metrological data. Monitoring will be undertaken according to SANS 1929:2005.
- The focus is on avoiding dust and PM_{10} levels exceeding generally acceptable thresholds for residential and construction areas, but with a general target of the average dust deposition rate over a year not exceeding 300 mg/m^2/day and PM_{10} concentrations not exceeding an annual average of 40 µg/m^3 per 24-hour period. The following are acceptable levels, as averages over 30 days:

Dust deposition rate	
Residential areas	<600 mg/m2/day
Construction areas	<1200 mg/m2/day
PM10 concentration	<75 µg/m3/24-hour period.

- When the abovementioned thresholds are exceeded the situation will be investigated and the cause must be eliminated.
- When the dust deposition rate at any point exceeds 2400 mg/m2/day immediate remedial action must be taken, and an incident report submitted.

- If a situation arises which leads to complaints from occupiers of properties adjacent to the work area that dust emissions constitute a health hazard or a nuisance, or the Engineer from visual observation believes this to be the case, instructions will be issued by the Engineer that the activities causing the offending episode must cease immediately and the episode will be investigated. Only once proposed remedial action has been approved by the Engineer may the Contractor implement such action at his cost and may work in that area resume.
- A monthly report must be submitted to the Engineer within 10 days of taking the last sample containing results of monitoring and comments on the progress made in dealing with this aspect and records of all notable events.

c. Water quality monitoring

Objective

To maintain water quality as identified in the EIA water quality specialist study (dated 2010).

Target

Prevent impact on aquatic life due to pesticides and herbicides.
To conduct regular water analysis to ensure current water quality

Monitoring Phase

- The Water Management Method Statement must include measures to prevent the pollution of any river, stream or wetland with grease, hydrocarbons, suspended solids or other contaminants emanating from construction activities, these measures shall include a site plan, approved by the Engineer, on which is shown monitoring points of all **treated or un-treated discharges to a public stream** (considered to be industrial wastewater for this purpose) where monitoring of flow rate and quality will be undertaken in accordance with the requirements of Government Notice 655 published in Government Gazette No 36820 dated 6 September 2013.
- The flow rate and quality of all potential discharges of treated and un-treated waste water from the construction site, at points marked on a site plan in the WMMS for approval by the Engineer, will be monitored in accordance with the

requirements of Government Notice 655 published in Government Gazette No 36820 dated 6 September 2013.

- Water sampling must follow a clear protocol specified by the laboratory that will perform the analyses or at least be compliant with the guidelines in the water Research Commission Report TT 117/99. Measurements and analytical procedures must conform to the relevant SANS.
- All discharges from settlement ponds, sewage treatment works, batching plants, washing areas and any other areas must be sampled and tested at points approved by the Engineer. The quality of point discharges shall comply with the criteria given in **Table 7.2**. Water quality monitoring reports must be submitted to the Engineer within 10 days of taking the sample.

Table 7.2: List of Water Quality Variables that must be sampled at the Discharge Point

VARIABLE	REQUIRED EFFLUENT STANDARD
COD	Not to exceed 5 • •
Conductivity	Not to exceed 250 mS/m
Dissolved oxygen	At least 75% saturation
Feacal coliforms Thermotolerant (faecal) coliform bacteria	No *E. coli* (0/100 • • No Thermotolerant (faecal) coliform bacteria (0/100
Free & saline ammonia (as N)	Not to exceed 1.0 • •
Nitrate (as $N0_3$)	Not to exceed 1.5 • •
Nitrite	Not to exceed 1.0 • •
pH	Between 5,5 and 7,5
Hydrocarbons (BTEX)	No hydrocarbons (BTEX)
Suspended solids	Not to exceed 10 • •
Temperature	Maximum of 25°C. In addition the effect of water discharged into watercourses shall not raise the water within the watercourse at a point 500 m downstream of the point of discharge by more than 2^oC above the temperature of the water 500 m upstream of the Works

Table 7.3: Additional Water Quality Variables that may be Sampled at the Discharge Point, at the discretion of the Engineer

VARIABLE	REQUIRED EFFLUENT STANDARD
Arsenic (as As)	Not to exceed 0.1 • •
Boron (as B)	Not to exceed 0.5 • •
Cadmium (as Cd)	Not to exceed 0.05 • •
Colour, odour, taste	Free of any substance in a concentration capable of producing any colour, odour or taste
Conductivity	Not to exceed 250 mS/m
Copper (as Cu)	Not to exceed 0.02 • •
Cyanide (as Cn)	Not to exceed 0.5 • •
Fluoride (as F)	Not to exceed 1.0 • •
Lead (as Pb)	Not to exceed 0.1 • •
Manganese (as Mn)	Not to exceed 0.1 • •
Mercury (as Hg)	Not to exceed 0.02 • •
Phenolic compound (as phenol)	Not to exceed 0.01 • •
Phosphate (as $P0_4$)	Not to exceed 1.0 • •
Residual Chlorine (as Cl)	Non residual chlorine
Selenium (as Se)	Not to exceed 0.05 • •
Soap, oil, grease	No soap, oil or grease
Sodium	Not to be increased by more than 50 mg

- pH
- Electrical conductivity
- Dissolved oxygen
- Suspended solids.

The Engineer may require more detailed testing where there is evidence of contamination.

Water quality sampling at the upstream and downstream monitoring sites will be made at the same time –around noon - each day. The maximum "allowable limit of change" in any water quality parameter at the downstream monitoring point should not be greater than 10 % above the value for the respective water quality parameter measured at the upstream monitoring point. Careful records shall be kept of all occasions when the water quality at a downstream monitoring point has exceeded the limits of allowable change.

Should the values of any of these key indicator variables at the downstream site vary by 10 % or more relative to measurements of the same variables taken at approximately the same time at the upstream site, it could indicate that associated changes have occurred in some of the other water quality variables. Immediate mitigation action will be required on the site and water samples should be collected as soon as possible and sent to the accredited analytical laboratory for analysis of the full list of river and wetland variables (**Table 7.3**). The laboratory should be requested to provide the results of these samples within 14 working days.

Table 7.4: Water Quality Monitoring variables for rivers and wetlands

Parameters and Variable	Testing Frequency	Test Responsibility
COD (mg/l)	Every 2 days when flow is present	Collect sample on site analyze in laboratory
Nitrate and Nitrite (mg/l)	Every 2 days when flow is present	Sample on site & laboratory analysis
Orthophosphates (mg/l)	Every 2 days when flow is present	Sample on site & laboratory analysis
Suspended Solids (TSS) (mg/l)	Every 2 days when flow is present	Sample on site & laboratory analysis

Parameters and Variable	Testing Frequency	Test Responsibility
Soaps, oil and grease (mg/l)	Every 2 days when flow is present	Sample on site & laboratory analysis
Free & Saline ammonia (mg/l)	Every 2 days when flow is present	Sample on site & laboratory analysis
Faecal Coliform bacteria (per 100ml)	Every 2 days when flow is present	Sample on site & laboratory analysis
Conductivity (mS/m)	Daily when flow is present	Measure on site using hand-held meter
Dissolved oxygen (% saturation)	Daily when flow is present	Measure on site using hand-held meter
pH	Daily when flow is present	Measure on site using hand-held meter
Temperature	Daily when flow is present	Measure on site using hand-held meter when any one of the key variables deviates by more than 10% from the upstream value at the construction site
Turbidity (NTU)	Daily when flow is present	Measure on site using hand-held meter when any one of the key variables deviates by more than 10% from the upstream value at the construction site

Note: Concentrations of the above variables measured 50 m downstream of the works in a water resource system must not differ by more than 10% of concentrations of the same variables measured 300 m upstream of the works.

As soon as practically possible, each incident of water contamination shall be investigated, the contamination source(s) located and mitigatory measures implemented to prevent further contamination. A set of confirmatory measurements shall be taken after the implementation of remedial/mitigatory actions to demonstrate that the problem has been dealt with successfully.

d. Aquatic life monitoring

Objective

To monitor invertebrate fish communities.

Target

Prevent impact on invertebrate fish communities during construction phase.

Monitoring phase

- During the construction phase the impact of the construction activities on fish communities will be measured against the baseline study undertaken during the pre-construction phase. Acceptable levels of change will have to be agreed as Targets.
- After commissioning (to be included in the Operation EMP to be drafted at a later stage) monitoring of the fish communities will continue however this could be less intensive than during construction.

7.19 SITE CLOSURE

Once the environmental items on the incidents register list have been addressed to the satisfaction of the ECO, the ECO will provide an environmental performance certificate confirming that the environmental specifications applicable to the Contractor(s) have been met. This certificate will be submitted to the Engineer prior to the final Certificate of Completion being issued.

APPENDIX A:

Environmental Authorisation and Amendment

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

Private Bag X 447· PRETORIA · 0001· Fedsure Building · 315 Pretorius Street · PRETORIA
Tel (+ 27 12) 310 3911 · Fax (+ 2712) 322 2682

NEAS Reference: DEAT/EIA/12395/2011
DEA Reference: 12/12/20/978/2
Enquiries: Masina Litsoane
Telephone: 012-395-1778 **Fax:** 012-320-7539 **E-mail:** MLitsoane@environment.gov.za

Mr. Ockie van den Berg
Department of Water Affairs
Private Bag X313
PRETORIA
0001

Fax no: 012-336-7399

PER FACSIMILE / MAIL

Dear Mr van den Berg

APPLICATION FOR ENVIRONMENTAL AUTHORISATION IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998: GN R. 387: GROOT LETABA RIVER WATER DEVELOPMENT: CONSTRUCTION OF NEW NWAMITWA DAM AND ASSOCIATED INFRASTRUCTURE, LIMPOPO PROVINCE

With reference to the above application, please be advised that the Department has decided to grant authorisation. The environmental authorisation (EA) and reasons for the decision are attached herewith.

In terms of regulation 10(2) of the Environmental Impact Assessment Regulations, 2010 (the Regulations), you are instructed to notify all registered interested and affected parties, in writing and within 12 (twelve) days of the date of the EA, of the Department's decision in respect of your application as well as the provisions regarding the submission of appeals that are contained in the Regulations.

Your attention is drawn to Chapter 7 of the Regulations, which prescribes the appeal procedure to be followed. This procedure is summarised in the attached document. Kindly include a copy of this document with the letter of notification to interested and affected parties.

Should the applicant or any other party wish to appeal any aspect of the decision a notice of intention to appeal must be lodged by all prospective appellants with the Minister, within 20 days of the date of the EA, by means of one of the following methods:

By facsimile:	012 320 7561;
By post:	Private Bag X447, Pretoria, 0001; or
By hand:	2nd Floor, Fedsure Building, North Tower, cnr. Van der Walt and Pretorius Streets, Pretoria.

If the applicant wishes to lodge an appeal, it must also serve a copy of the notice of intention to appeal on all registered interested and affected parties as well as a notice indicating where, and for what period, the appeal submission will be available for inspection, should you intend to submit an appeal.

Please include the Department *(Attention: Director: Environmental Impact Evaluation)* in the list of interested and affected parties, notified through your notification letter to interested and affected parties, for record purposes.

Appeals must be submitted in writing to:
Mr T Zwane, Senior Legal Administration Officer (Appeals) of this Department at the above mentioned addresses or fax number. Mr Zwane can also be contacted at:

Tel: 012-310-3929
Email: tzwane@environment.gov.za

The authorised activities shall not commence within twenty (20) days of the date of signature of the authorisation. Further, please note that the Minister may, on receipt of appeals against the authorisation or conditions thereof suspend the authorisation pending the outcome of the appeals procedure.

Yours sincerely

Mr Ishaam Abader
Deputy Director-General: Environmental Quality and Protection
Department of Environmental Affairs
Date: 04/10/2011

CC:	Ms Terry Baker	ILISO Consulting	Tel: 012-682-0925	Fax: 012-665-1886
	Mr T Zwane	Appeals Authority (DEA)	Tel: 012-310-3929	Fax: 012-320-7561

APPEALS PROCEDURE IN TERMS OF CHAPTER 7 OF THE NEMA EIA REGULATIONS, 2010 (THE REGULATIONS) AS PER GN R. 543 OF 2010 TO BE FOLLOWED BY THE APPLICANT AND INTERESTED AND AFFECTED PARTIES UPON RECEIPT OF NOTIFICATION OF AN ENVIRONMENTAL AUTHORISATION (EA)

APPLICANT	INTERESTED AND AFFECTED PARTIES (IAPs)
1. Receive EA from the relevant Competent Authority (the Department of Environmental Affairs [DEA])	1. Receive EA from Applicant/Consultant
2. Within 12 days of date of the EA notify all IAPs of the EA and draw their attention to their right to appeal against the EA in terms of Chapter 7 of the Regulations.	2. N/A
3. If you want to appeal against the EA, submit a notice of intention to appeal within 20 days of the date of the EA. with the Minister of Water and Environmental Affairs (the Minister).	3. If you want to appeal against the EA, submit a notice of intention to appeal within 20 days of the date of the EA. with the Minister of Water and Environmental Affairs (the Minister).
4. After having submitted your notice of intention to appeal to the Minister, provide each registered IAP with a copy of the notice of intention to appeal within 10 days of lodging the notice	4. After having submitted your notice of intention to appeal to the Minister, provide the applicant with a copy of the notice of intention to appeal within 10 days of lodging the notice
5. The Applicant must also serve on each IAP: • a notice indicating where and for what period the appeal submission will be available for inspection.	5. Appellant must also serve on the Applicant within 10 days of lodging the notice, • a notice indicating where and for what period the appeal submission will be available for inspection by the applicant.
6. The appeal must be submitted in writing to the Minister within 30 days after the lapsing of the period of 20 days provided for the lodging of the notice of intention to appeal.	6. The appeal must be submitted to the Minister within 30 days after the lapsing of the period of 20 days provided for the lodging of the notice of intention to appeal.
7. Any IAP who received a notice of intention to appeal may submit a responding statement to that appeal to the Minister within 30 days from the date that the appeal submission was lodged with the Minister.	7. An Applicant who received notice of intention to may submit a responding statement to the appeal to the Minister within 30 days from the date that the appeal submission was lodged with the Minister.

NOTES:

1. **An appeal against a decision must be lodged with:-**
   a) the Minister of Water and Environmental Affairs if the decision was issued by the Director- General of the Department of Environmental Affairs (or another official) acting in his/ her capacity as the delegated Competent Authority;
   b) the Minister of Justice and Constitutional Development if the applicant is the Department of Water Affairs and the decision was issued by the Director- General of the Department of Environmental Affairs (or another official) acting in his/ her capacity as the delegated Competent Authority;

2. **An appeal lodged with:-**
   a) the Minister of Water and Environmental Affairs must be submitted to the Department of Environmental Affairs;
   b) the Minister of Justice and Constitutional Development must be submitted to the Department of Environmental Affairs;

3. **An appeal must be:-**
   a) submitted in writing;
   b) accompanied by:
   - a statement setting out the grounds of appeal;
   - supporting documentation which is referred to in the appeal; and
   - a statement that the appellant has complied with regulation 62 (2) or (3) together with copies of the notices referred to in regulation 62.

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

Environmental Authorisation

In terms of regulation 37 of the Environmental Impact Assessment Regulations, 2006

Groot Letaba River Water Project: Construction of new Nwamitwa Dam and associated infrastructure, Limpopo Province

Mopani District Municipality

Authorisation register number:	*12/12/20/978/2*
NEAS reference number:	*DEAT/NEAS/12395/2011*
Last amended:	*First issue*
Holder of authorisation:	*Department of Water Affairs*
Location of activity:	*LIMPOPO PROVINCE: In the Groot Letaba River catchment within Greater Tzaneen Local Municipality*

This authorisation does not negate the holder of the authorisation's responsibility to comply with any other statutory requirements that may be applicable to the undertaking of the activity.

Decision

The Department is satisfied, on the basis of information available to it and subject to compliance with the conditions of this environmental authorisation, that the applicant should be authorised to undertake the activities specified below.

Details regarding the basis on which the Department reached this decision are set out in Annexure 1.

Activities authorised

By virtue of the powers conferred on it by the National Environmental Management Act, 1998 (Act 107 of 1998) and the Environmental Impact Assessment Regulations, 2006 the Department hereby authorises –

DEPARTMENT OF WATER AFFAIRS

with the following contact details –

Mr. Ockie van den Berg
Department of Water Affairs
Private Bag X313
PRETORIA
0001

Tel: (012) 336 8613
Fax: (012) 336 7399
Cell: (082) 809 2011
E-mail: VanDenBergO@dwa.gov.za

to undertake the following activities (hereafter referred to as "the activity"):

GN R. 386:

Item 1 (k): *The bulk transportation of sewage and water, including storm water, in pipeline with –*

i. An internal diameter of 0.36 meters or more; or

ii. A peak throughput of 120 litres per second or more.

Item 1 (m): *The construction of facilities or infrastructure, including associated structures or infrastructure, for any purpose in the one in ten year flood line of a river or stream, or within 32m from the back of a river or stream where the flood line is unknown, excluding purposes associated with existing residential use, but including (i) canals; (ii) channels; (iii) bridges; (iv) dams; and (v) weirs.*

Item 1 (n): *The off-stream storage of water, including dams and reservoirs, with a capacity of 50 000 cubic metres or more, unless such storage falls within the ambit of the activity listed in Item 6 of Government Notice No. R 397 of 2006.*

Item 1 (o): *The recycling, reuse, handling, temporary storage or treatment of general waste with a throughput of 20 cubic metres or more daily average measured over a period of 30 days, but less than 50 tons daily average measured over a period of 30 days*

Item 4: *The dredging, excavation, infilling, removal or moving of soil, sand or rock exceeding 5 cubic metres from a river, tidal lagoon, tidal river, lake ,in-stream dam, floodplain or wetland.*

Item 7: *The above ground storage of a dangerous good, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30 cubic metres but less than 1000 cubic metres at any one location or site.*

Item 15: *The construction of a road that is wider than 4 meters or that has a reserve wider than 6 meters, excluding roads that fall within the ambit of another listed activity or which are access roads of less than 30 meters long*

GN R. 387:

Item 1 (c): *The above storage of a dangerous good, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of 1 000 cubic meters or more at any one location or site including the storage of one or more dangerous goods, in a tank farm.*

Item 1(e): Any process or activity which requires a permit or license in terms of legislation governing the generation or release of emissions, pollution, effluent or waste and which is not identified in GN R 386 of 2006.

Item 1 (p): The treatment of effluent, wastewater or sewage with an annual throughput capacity of 15 000 cubic meters or more.

Item 2: Any development activity, including associated structures and infrastructure, where the total area of the developed area is, or is intended to be 20 hectares or more.

Item 5: The route determination of roads and design of associated physical infrastructure, including roads that have not yet been built for which roads have been determined before the publication of this notice and which has not been authorised by a competent authority in terms of the Environmental Impact Assessment Regulations, 2006 made under section 24(5) of the Act and published in Government Notice No. R. 385 of 2006, where –

a) It is a national road as defined in section 40 of the South African National Roads Agency Limited and National Roads Act, 1998 (Act No. 7 of 1998);

b) It is a road administered by a provincial authority;

c) The road reserve is wider than 30 meters; or

d) The road will cater for more than one lane of traffic in both directions.

Item 6: The construction of a dam where the highest part of the dam wall, as measured from the outside toe of the wall to the highest part of the wall, is 5 meters or higher or where the high-water mark of the dam covers an area of 10 hectares or more.

as described in the Environmental Impact Assessment Report (EIR) dated August 2010 at:

Alternative S1	Latitude	Longitude
New Nwamitwa Dam	23°45'48.43"S	30°29'23.55"E

- for the construction of a new Nwamitwa Dam and associated infrastructure within Greater Tzaneen Local Municipality in the Limpopo Province, hereafter referred to as "the property".

The dam and associated infrastructure shall be constructed on the following farm portions:

- Dam site and basin:

Mamitwas Location 461 LT; Janetsi 463 LT; La Motte 464 LT; Laborie 515 LT; Nagute 517 LT; Riverside 514 LT; La Gratitude 513 LT; Belle Ombre 518 LT; Belle Ombre 827 LT; The Plains 828 LT; The Plains 519 LT; Languedoc 563 LT; The Junction 521 LT and Delhi 520 LT.

- Infrastructure:

Mamitwaskop 462 LT; Mamitwas Location 461 LT; Womgololo 428 LT; Sirulurul 427 LT; Makube 425 LT; Gamela 679 LT; Oochock 683 LT; Mwa 680 LT and Vallabrosa 681 LT.

The infrastructure components of the proposed project include:

- Construction of a new dam on the Groot Letaba River, downstream of the confluence of the Nwanedzi River;
- Re-alignment of the R529, D1292 and P43/3 roads to accommodate the dam;
- Upgrade of Nkambako Water Treatment Works;
- Construction of bulk water pipelines and pump stations from the dam for water supply for domestic use to communities in the area;
- Burrow areas from which materials required will be sourced; and
- Construction sites which include offices, internal roads, water and electricity supply, waste water treatment, solid waste disposal, emergency facilities, areas for handling of hazardous substances, workshops, wash bays, areas for the safe storage of fuel and explosives and communication infrastructure.

Conditions

Scope of authorisation

1. The proposed construction of Nwamitwa Dam and associated infrastructure with preferred alternative 4 for road re-alignment and preferred alternatives A, B, C1 and D3 for reservoirs is hereby approved.
2. Authorisation of the activity is subject to the conditions contained in this authorisation, which form part of the environmental authorisation and are binding on the holder of the authorisation.

3. The Department, by written notice to the holder of an environmental authorisation shall suspend with immediate effect an environmental authorisation if suspension of the authorisation is necessary to prevent harm or further harm to the environment.
4. The holder of the authorisation is responsible for ensuring compliance with the conditions contained in this environmental authorisation. This includes any person acting on the holder's behalf, including but not limited to, an agent, servant, contractor, sub-contractor, employee, consultant or person rendering a service to the holder of the authorisation.
5. The activities authorised may only be carried out at the property as described above.
6. Any changes to, or deviations from, the project description set out in this authorisation must be approved, in writing, by the Department before such changes or deviations may be effected. In assessing whether to grant such approval or not, the Department may request such information as it deems necessary to evaluate the significance and impacts of such changes or deviations and it may be necessary for the holder of the authorisation to apply for further authorisation in terms of the regulations.
7. This activity must commence within a period of five (5) years from the date of issue. If commencement of the activity does not occur within that period, the authorisation lapses and a new application for environmental authorisation must be made in order for the activity to be undertaken.
8. Commencement with one activity listed in terms of this authorisation constitutes commencement of all authorised activities.
9. This authorisation does not negate the holder of the authorisation's responsibility to comply with any other statutory requirements that may be applicable to the undertaking of the activity.
10. Relevant legislation that must be complied with by the holder of this authorisation includes, *inter alia:*
    - Archaeological remains, artificial features and structures older than 60 years are protected by National Heritage Resources Act, 1999 (Act 25 of 1999). Should any archaeological artefacts be exposed during excavation for the purpose of construction, construction in the vicinity of the finding must be stopped immediately. A registered Heritage Specialist must be called to the site for inspection. Under no circumstances shall any heritage material be destroyed or removed from the site and the relevant heritage resource agency must be informed about the finding. Heritage remains uncovered or disturbed during earthworks must not be disturbed further until the necessary approval has been obtained from the South African Heritage Resources Agency and/or any of their delegated provincial agencies.
    - Relevant provisions of the Occupational Health and Safety Act, 1993 (Act 85 of 1993).

- Relevant provisions of the National Water Act, 1998 (Act 36 of 1998).
- Relevant provisions of the National Forests Act, 1998 (Act 84 of 1998).
- Relevant provisions of the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004).
- Relevant provisions of the National Environmental Management: Protected Areas Act, 2003 (Act 57 of 2003) and its Regulations.
- Should fill material be required for any purpose, the use of borrow pits must comply with the provisions of the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002) administered by the Department of Mineral Resources.

11. The holder of an environmental authorisation has the responsibility to notify the competent authority of any alienation, transfer and change of ownership rights in the property on which the activity is to take place.

Notification of authorisation

12. The holder of the authorisation must notify every registered interested and affected party, in writing and within 12 (twelve) calendar days of the date of this environmental authorisation, of the decision to authorise the activity.
13. The notification referred to must –

13.1. specify the date on which the authorisation was issued;

13.2. inform the interested and affected party of the appeal procedure provided for in Chapter 7 of the Environmental Impact Assessment (EIA) Regulations, 2010;

13.3. advise the interested and affected party that a copy of the authorisation will be furnished on request; and

13.4. give the reasons for the decision.

Management of the activity

14. The Environmental Management Plan (EMP) for construction submitted as part of application for environmental authorisation must be amended and submitted to the Department for written approval prior to commencement of the activity and it must include measures as dictated by the final dam designs. The recommendations and mitigation measures recorded in the EIR dated

August 2010 must be incorporated as part of the EMP. Once approved, the EMP must be implemented and adhered to.

Monitoring

15. The applicant must appoint an independent Environmental Control Officer (ECO) for the construction phase of the development that will have the responsibility to ensure that the mitigation/rehabilitation measures and recommendations referred to in this authorisation are implemented and to ensure compliance with the provisions of the EMP.
16. The ECO shall be appointed before commencement of any authorised activity.
17. Once appointed, the name and contact details of the ECO must be submitted to the *Director: Compliance Monitoring* of the Department.
18. The ECO shall keep record of all activities on site, problems identified, transgressions noted and a task schedule of tasks undertaken by the ECO.
19. The ECO shall remain employed until all rehabilitation measures, as required for implementation due to construction damage, are completed and the site is ready for operation.
20. Records relating to monitoring and auditing must be kept on site and made available for inspection to any relevant and competent authority in respect of this development.

Recording and reporting to the Department

21. All documentation e.g. audit/monitoring/compliance reports and notifications, required to be submitted to the Department in terms of this authorisation, must be submitted to the *Director: Compliance Monitoring* at the Department.
22. The holder of the authorisation must submit an environmental audit report upon completion of the construction and rehabilitation activities.
23. The environmental audit report must indicate the date of the audit, the name of the auditor and the outcome of the audit in terms of compliance with the environmental authorisation conditions as well as the requirements of the EMP.

Commencement of the activity

24. The authorised activity shall not commence within twenty (20) days of the date of signature of the authorisation.

25. The applicant must submit a final layout plan for the entire dam and associated infrastructure for approval to the Department and the layout should indicate:
    - Foundation footprint;
    - Permanent lay down area footprint;
    - Construction period lay down footprint;
    - Internal roads indicating width (construction period width and operation period width) and numbered sections between the other site elements which they serve (to make commenting on sections possible);
    - Wetlands, drainage lines, rivers, stream and water crossing of roads and cables indicating the type of bridging structures that will be used;
    - Heritage sites that will be affected by the new dam and associated infrastructure;
    - Borrow pits;
    - Spoil heaps (temporary for topsoil and subsoil and permanently for excess material);
    - Buildings including accommodation;
    - Helipad; and
    - All "no-go" areas.
26. An appeal under section 43 of the National Environmental Management Act (NEMA), Act 107 of 1998 (as amended), does not suspend an environmental authorisation or exemption, or any provisions or conditions attached thereto, or any directive, unless the Minister, MEC or delegated organ of state directs otherwise.

Notification to authorities

27. Fourteen (14) days written notice must be given to the Department that the activity will commence. Commencement for the purposes of this condition includes site preparation. The notice must include a date on which it is anticipated that the activity will commence. This notification period may coincide with the period contemplated in 24 above.

Operation of the activity

28. Fourteen (14) days written notice must be given to the Department that the activity operational phase will commence.

29. The applicant must compile an operational EMP for the operational phase of the activity or alternatively, if the applicant has an existing operational environmental management system, it must be amended to include the operation of the authorised activity.

Site closure and decommissioning

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

Specific conditions

31. Prior to commencement of construction activities, final detailed dam designs and outlet works must be submitted to the Department for approval.
32. Standard Protocol Process of shared water must be finalised prior to commencement of the activities and must be submitted to the Department for record-keeping.
33. Prior to the onset of the construction phase, a thorough quadrant search of the footprint must be undertaken during the flowering season to search for known RDL floral species in order to rescue affected species. Individual can be translocated to the outside of the footprint or removed to a suitable botanical garden for cultivation and protection. This should only be done after consultation with provincial conservation authorities.
34. A permit must be obtained from the relevant nature conservation agency for the removal or destruction of indigenous protected and endangered plant and animal species.
35. Copies of permits in respect of 31 above required must be submitted to the Department for record keeping.
36. A permit must be obtained from SAHRA for the relocation of graves and other heritage resources found on site.
37. Copies of permits in respect of 34 above required must be submitted to the Department for record keeping.
38. Hazardous materials must be stored in regularly serviced containers enclosed in bunded areas. The bunded areas must be provided with a tap-off system through which spillages and leakages that might occur will be removed without any spillage outside of the bunded areas.

39. Chemical ablution facilities must be available for use by construction staff at all times during the construction period. These facilities must be removed from the site when the construction phase is completed.
40. All hard infrastructures should be located within existing low sensitivity and disturbed areas as far as possible.
41. The construction camp must be located in a disturbed area and must be screened off during the entire construction phase.
42. A comprehensive habitat rehabilitation plan must be developed for the site. Restoration must be undertaken as soon as possible after construction activities to reduce the amount of habitat converted at any one time and to speed up the recovery of natural habitats.
43. No exotic plants may be used for rehabilitation purposes. Only indigenous plants of the area may be utilised.
44. Vegetation clearing must be kept to an absolute minimum. Mitigation measures must be implemented to reduce the risk of erosion and the invasion of alien species.
45. Signs must be placed along construction roads to identify speed limits, travel restrictions, and other standard traffic control information. To minimise impacts on local commuter, consideration should be given to limiting construction vehicles on public roadways during the morning and late afternoon commuting time.
46. Construction must include appropriate design measures that allow surface and subsurface movement of water along drainage lines so as not to impede natural surface and subsurface flows. Drainage measures must promote the dissipation of storm water run-off.
47. Burrow materials must be obtained only from authorised and permitted sites.
48. Liaison with land owners/farm managers is to be done prior to construction in order to provide sufficient time for them to plan agricultural activities
49. An integrated waste management approach must be implemented that is based on waste minimisation and must incorporate reduction, recycling, re-use and disposal where appropriate. Any solid waste shall be disposed of at a landfill licensed in terms of section 20 (b) of the National Environment Management Waste Act, 2008 (Act 59 of 2008).

General

50. A copy of this authorisation must be kept at the property where the activity will be undertaken. The authorisation must be produced to any authorised official of the Department who requests to see it

and must be made available for inspection by any employee or agent of the holder of the authorisation who works or undertakes work at the property.

51. Where any of the applicant's contact details change, including the name of the responsible person where the applicant is a juristic person, the physical or postal address and/or telephonic details, the applicant must notify the Department as soon as the new details become known to the applicant.
52. The holder of the authorisation must notify the Department, in writing and within 48 (forty eight) hours, if any condition of this authorisation cannot be or is not adhered to. Any notification in terms of this condition must be accompanied by reasons for the non-compliance. Non-compliance with a condition of this authorisation may result in criminal prosecution or other actions provided for in the National Environmental Management Act, 1998 and the regulations.
53. National government, provincial government, local authorities or committees appointed in terms of the conditions of this authorisation or any other public authority shall not be held responsible for any damages or losses suffered by the applicant or his successor in title in any instance where construction or operation subsequent to construction be temporarily or permanently stopped for reasons of non-compliance by the applicant with the conditions of authorisation as set out in this document or any other subsequent document emanating from these conditions of authorisation.

Date of environmental authorisation: 24 OCTOBER 2011

Mr Ishaam Abader

Deputy Director-General: Environmental Quality and Protection

Department of Environmental Affairs

Annexure 1: Reasons for Decision

1. Information considered in making the decision

In reaching its decision, the Department took, *inter alia*, the following into consideration -

a) The information contained in the EIR dated August 2010;
b) The comments received from the Directorate: Biodiversity and Conservation, organs of state and interested and affected parties as included in the EIR dated August 2010;
c) Great Letaba River Water Development Project Technical Study Module - Main/Final Report: Volume dated May 2010.
d) Mitigation measures as proposed in the EIR dated August 2010 and the EMP;
e) The information contained in the specialist studies contained within Appendix D of the EIR and
f) The objectives and requirements of relevant legislation, policies and guidelines, including section 2 of the National Environmental Management Act, 1998 (Act 107 of 1998).

2. Key factors considered in making the decision

All information presented to the Department was taken into account in the Department's consideration of the application. A summary of the issues which, in the Department's view, were of the most significance is set out below.

a) Details provided of the qualifications of the EAP indicate that the EAP is competent to carry out the environmental impact assessment procedures.
b) The findings of all the specialist studies conducted and their recommended mitigation measures.
c) The need for the proposed project stems from the need to increase the assurance of water supply for irrigation of high value permanent crops, mainly citrus and augment the water supply for domestic use.
d) The EIR dated August 2010 included a description of the environment that may be affected by the activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity.

e) The EIR dated August 2010 identified all legislation and guidelines that have been considered in the preparation of the EIR.

f) The methodology used in assessing the potential impacts identified in the EIR dated August 2010 and the specialist studies have been adequately indicated.

g) A sufficient public participation process was undertaken and the applicant has satisfied the minimum requirements as prescribed in the EIA Regulations, 2006 for public involvement.

3. Findings

After consideration of the information and factors listed above, the Department made the following findings -

a) According to Great Letaba River Water Development Project Technical Study Module, Nwamitwa Dam will be a large dam (>30 m high) with a high hazard potential (due to extensive downstream developments) and will be classified as a Category III dam in terms of the Dam Safety Regulations.

b) It is recommended that the straight ogee spillway be adopted in the preliminary design of Nwamitwa Dam.

c) The flow regime specified in the Reserve for the Great Letaba River (signed off by DG: DWA in 2006) is fully accounted for in the water resource system model used to evaluate the availability of water and to size the main components of the proposed development.

d) The identification and assessment of impacts are detailed in the EIR dated August 2010 and sufficient assessment of the key identified issues and impacts have been completed.

e) The procedure followed for impact assessment is adequate for the decision-making process.

f) The proposed mitigation of impacts identified and assessed adequately curtails the identified impacts.

g) All legal and procedural requirements have been met.

h) The information contained in the EIR dated August 2010 is accurate and credible.

In view of the above, the Department is satisfied that, subject to compliance with the conditions contained in the environmental authorisation, the proposed activity will not conflict with the general objectives of integrated environmental management laid down in Chapter 5 of the National Environmental Management Act, 1998 and that any potentially detrimental environmental impacts resulting from the proposed activity can be mitigated to acceptable levels. The application is accordingly granted.

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA
Private Bag X 447 · PRETORIA · 0001 · Fedsure Building · 315 Pretorius Street · PRETORIA
Tel (+ 27 12) 310 3911 · Fax (+ 2712) 322 2682

NEAS Reference: DEAT/EIA/12395/2011
DEA Reference: 12/12/20/978/2
Enquiries: Masina Litsoane
Telephone: 012-395-1778 **Fax:** 012-320-7539 **E-mail:** MLitsoane@environment.gov.za

Mr. Ockie van den Berg
Department of Water Affairs
Private Bag X313
PRETORIA
0001

Fax No: 012-336-7399

PER FACSIMILE / MAIL

Dear Mr van den Berg

AMENDMENT OF THE ENVIRONMENTAL AUTHORISATION ISSUED ON 24 OCTOBER 2011 FOR THE GROOT LETABA RIVER WATER DEVELOPMENT: CONSTRUCTION OF NEW NWAMITWA DAM AND ASSOCIATED INFRASTRUCTURE, LIMPOPO PROVINCE

With reference to the above application, please be advised that the Department, in terms of Regulation 42 of Environmental Impact Assessment Regulations, 2010, has decided to amend the environmental authorisation (EA) dated 24 October 2011 by correcting editorial errors, re-phrasing and removing conditions in accordance with regulation 38 (3). All amendments have been highlighted below in bold.

The following condition is removed from the EA dated 24 October 2011:

Condition 9: *This authorisation does not negate the holder of the authorisation's responsibility to comply with any other statutory requirements that may be applicable to the undertaking of the activity.*

The following conditions are re-phrased from the EA dated 24 October 2011:

Condition 10: "Under no circumstances shall any heritage material be destroyed or removed from the site **other than by the SAHRA approved archaeologist who may remove the material for curating or investigation in accordance with SAHRA prescripts.**"

Condition 14: "The Environmental Management Plan (EMP) for construction submitted as part of application for environmental authorisation must be amended and submitted to the Department for written approval prior to commencement of the activity. The recommendations and mitigation measures recorded in the EIR dated August 2010 must be incorporated as part of the EMP **in so far as they do not contradict any other legislation**. Once approved, the EMP must be implemented and adhered to."

Condition 25: "The applicant must submit a layout plan for the entire dam basin and associated infrastructure for approval to the Department, indicating information as requested and available as at time of authorisation and amended as further information becomes available to the Department and the layout should indicate:

- Foundation footprint;
- Permanent lay down area footprint;
- Construction period lay down footprint;
- Internal roads indicating width (construction period width and operation period width) and numbered sections between the other site elements which they serve (to make commenting on sections possible);
- Wetlands, drainage lines, rivers, stream and water crossing of roads and cables indicating the type of bridging structures that will be used;
- Heritage sites that will be affected by the new dam and associated infrastructure;
- Borrow pits;
- Spoil heaps (temporary for topsoil and subsoil and permanently for excess material);
- Buildings including accommodation;
- Helipad; and
- All "no-go" areas."

Condition 31: "Prior to commencement of construction activities, **available** dam designs and outlet works must be submitted to the Department for **record purposes.**"

Condition 33: "Prior to **clearance of any area for construction activities**, a thorough quadrant search of the footprint must be undertaken during the flowering season to search for the known RDL floral species **listed in terrestrial ecology specialist study in support of the EIR**, in order to rescue affected species. Individual can be translocated to the outside of the footprint or removed to a suitable botanical garden for cultivation and protection. This should only be done after consultation with provincial conservation authorities."

Conditions 35 and 37 are amended to be read in conjunction with Conditions 34 and 36:

Condition 35: Copies of permits in respect of **34** above required must be submitted to the Department for record keeping purposes.

Condition 37: Copies of permits in respect of **36** above required must be submitted to the Department for record keeping purposes.

Condition 38: "Hazardous materials must be stored in regularly serviced containers enclosed in bunded areas. The bunded areas must be provided with a tap-off system, **which must be within the bunded area,** through which spillages and leakages that might occur will be removed without any spillage outside of the bunded areas."

Condition 46: "Construction, **other than of the authorised dam wall and weir** must include appropriate design measures that allow surface and subsurface movement of water along drainage lines so as not to impede natural surface and subsurface flows. Drainage measures must promote the dissipation of storm water run-off."

Condition 48: "Liaison with land owners/farm managers is to be done prior to construction in order to provide sufficient time for them to plan agricultural activities **in so far as the liaison with land owners or users does not conflict with any other Act of Parliament."**

The above amendments must be read with the Environmental Authorisation dated 24 October 2011.

In terms of regulation 10(2) of the Environmental Impact Assessment Regulations, 2010 (the Regulations), you are instructed to notify all registered interested and affected parties, in writing and within 12 (twelve) days of the date of the EA, of the Department's decision in respect of your amendment application as well as the provisions regarding the submission of appeals that are contained in the Regulations.

Your attention is drawn to Chapter 7 of the Regulations, which prescribes the appeal procedure to be followed. Please note that only the amended sections are subject to appeal. This procedure is summarised in the attached document. Kindly include a copy of this document with the letter of notification to interested and affected parties.

Should the applicant or any other party wish to appeal any aspect of the amended decision a notice of intention to appeal must be lodged by all prospective appellants with the Minister, within 20 days of the date of the EA, by means of one of the following methods:

By facsimile:	012 320 7561;
By post:	Private Bag X447, Pretoria, 0001; or
By hand:	2nd Floor, Fedsure Building, North Tower, cnr. Van der Walt and Pretorius Streets, Pretoria.

If the applicant wishes to lodge an appeal, it must also serve a copy of the notice of intention to appeal on all registered interested and affected parties as well as a notice indicating where, and for what period, the appeal submission will be available for inspection, should you intend to submit an appeal.

Please include the Department *(Attention: Director: Environmental Impact Evaluation)* in the list of interested and affected parties, notified through your notification letter to interested and affected parties, for record purposes.

Appeals must be submitted in writing to:

Mr T Zwane, Senior Legal Administration Officer (Appeals) of this Department at the above mentioned addresses or fax number. Mr Zwane can also be contacted at:

Tel: 012-310-3929
Email: tzwane@environment.gov.za

The authorised activities shall not commence within twenty (20) days of the date of signature of the authorisation. Further, please note that the Minister may, on receipt of appeals against the authorisation or conditions thereof suspend the authorisation pending the outcome of the appeals procedure.

Yours sincerely

Mr Ishaam Abader
Deputy Director-General: Environmental Quality and Protection
Department of Environmental Affairs
Date: 30/11/2011

CC:	Ms Terry Baker	ILISO Consulting	Tel: 012-682-0925	Fax: 012-665-1886
	Mr T Zwane	Appeals Authority (DEA)	Tel: 012-310-3929	Fax: 012-320-7561

APPEALS PROCEDURE IN TERMS OF CHAPTER 7 OF THE NEMA EIA REGULATIONS, 2010 (THE REGULATIONS) AS PER GN R.543 OF 2010 TO BE FOLLOWED BY THE APPLICANT AND INTERESTED AND AFFECTED PARTIES UPON RECEIPT OF NOTIFICATION OF AN ENVIRONMENTAL AUTHORISATION (EA)

APPLICANT	INTERESTED AND AFFECTED PARTIES (IAPs)
1. Receive EA from the relevant Competent Authority (the Department of Environmental Affairs [DEA])	1. Receive EA from Applicant/Consultant
2. Within 12 days of date of the EA notify all IAPs of the EA and draw their attention to their right to appeal against the EA in terms of Chapter 7 of the Regulations.	2. N/A
3. If you want to appeal against the EA, submit a notice of intention to appeal within 20 days of the date of the EA with the Minister of Water and Environmental Affairs (the Minister).	3. If you want to appeal against the EA, submit a notice of intention to appeal within 20 days of the date of the EA. with the Minister of Water and Environmental Affairs (the Minister).
4. After having submitted your notice of intention to appeal to the Minister, provide each registered IAP with a copy of the notice of intention to appeal within 10 days of lodging the notice	4. After having submitted your notice of intention to appeal to the Minister, provide the applicant with a copy of the notice of intention to appeal within 10 days of lodging the notice
5. The Applicant must also serve on each IAP: • a notice indicating where and for what period the appeal submission will be available for inspection.	5. Appellant must also serve on the Applicant within 10 days of lodging the notice, • a notice indicating where and for what period the appeal submission will be available for inspection by the applicant.
6. The appeal must be submitted in writing to the Minister within 30 days after the lapsing of the period of 20 days provided for the lodging of the notice of intention to appeal.	6. The appeal must be submitted to the Minister within 30 days after the lapsing of the period of 20 days provided for the lodging of the notice of intention to appeal.
7. Any IAP who received a notice of intention to appeal may submit a responding statement to that appeal to the Minister within 30 days from the date that the appeal submission was lodged with the Minister.	7. An Applicant who received notice of intention to may submit a responding statement to the appeal to the Minister within 30 days from the date that the appeal submission was lodged with the Minister.

NOTES:

1. **An appeal against a decision must be lodged with:-**
   a) the Minister of Water and Environmental Affairs if the decision was issued by the Director- General of the Department of Environmental Affairs (or another official) acting in his/ her capacity as the delegated Competent Authority;
   b) the Minister of Justice and Constitutional Development if the applicant is the Department of Water Affairs and the decision was issued by the Director- General of the Department of Environmental Affairs (or another official) acting in his/ her capacity as the delegated Competent Authority;

2. **An appeal lodged with:-**
   a) the Minister of Water and Environmental Affairs must be submitted to the Department of Environmental Affairs;
   b) the Minister of Justice and Constitutional Development must be submitted to the Department of Environmental Affairs;

3. **An appeal must be:-**
   a) submitted in writing;
   b) accompanied by:
   - a statement setting out the grounds of appeal;
   - supporting documentation which is referred to in the appeal; and
   - a statement that the appellant has complied with regulation 62 (2) or (3) together with copies of the notices referred to in regulation 62.

APPENDIX B:

Example of Method Statement

Method Statement (Part 1)	Doc Number: 001	
	Rev: 0	
	Date: 03/03/2014	
	Page 1 of 3	
Contractor/ Responsible person:	**Alternative:**	**Signed off:_____**
ID number:		**Date:**
Project:		**Accepted: yes/no**
Activity:		**Area:**
Procedure: *(In Steps)*	**Risk Assessment:** *(Include all possible hazards)*	**Response in case of non-compliance:**
1)		
2)		
3)		
4)		
5)		
6)		
7)		
8)		
9)		
10)		
	Safety and Environmental Controls:	**Emergency Procedures:**

Method Statement (Part 2)	Doc Number: 001
	Rev: 0
	Date: 03/03/2014
	Page 1 of 3
Personnel, Duties and Responsibilities: *(Details of the duties and specific responsibilities of supervisors and other personnel)*	**Training Required to Complete Work:**
	PPE Required:
Plant /Equipment: *(List plant and equipment used on job)*	**Legislation:** *(EMP, RoD, Work Specifications, All applicable legislation etc.)*

Method Statement (Part 3) - Register		Doc Number: 001 Rev: 0 Date: 03/03/2014 Page 1 of 3
Name :	**Position:**	**Signed:**

APPENDIX C:

Example of Emergency Incident Report

NB! Please ensure that all the information provided in brackets are removed before submitting this report to the all the Authorities.

This form provides a template for the emergency incident report required in terms of section 30(5) of the National Environmental

environmental affairs Department: Environmental Affairs REPUBLIC OF SOUTH AFRICA ENVIRONMENTAL MANAGEMENT INSPECTORATE	Document Type:	Emergency Incident Report	
	Title for the incident:		
	Date of the incident :		
Reference:		Initial Submission Date:	
Revision No.:		Compiled by:	

Management Act (Act No. 107 of 1998) (hereinafter "NEMA") in which the responsible person or, where the incident occurred in the course of that person´s employment, his or her employer, must, within 14 days of the incident, report to the Director General, provincial head of department and municipality such information as is available to enable an initial evaluation of the incident, including: (a) the nature of the incident; (b) the substances involved and an estimation of the quantity released and their possible acute effect on persons and the environment and data needed to assess these effects; (c) initial measures taken to minimise impacts; (d) causes of the incident, whether direct or indirect, including equipment, technology, system, or management failure; and (e) measures taken and to be taken to avoid a recurrence of such incident.

In terms of section 30(1)(a) of NEMA, an "incident" means an unexpected sudden occurrence, including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed.

In line with section 24 of the Constitution of the Republic of South Africa (Act No. 108 of 1996), "serious" is taken to be a measure of the impact of an incident where such an incident has had, could have had, is having, or will have a negative impact on human health or well-being.

1. RESPONSIBLE PERSON

In terms of section 30(1)(b) of NEMA, the "responsible person" includes any person who: (i) is responsible for the incident; (ii) owns any hazardous substance involved in the incident; or (iii) was in control of any hazardous substance involved in the incident at the time of the incident

1.1 Name:		1.2 Designation:	
1.3 Postal Address:		1.4 Physical Address:	
1.5 Telephone		1.6 Telephone (A/H):	
1.7 Fax:			
1.8 E-mail:			
1.9 Nature of Business:			

2. EMERGENCY INCIDENT SUMMARY INFORMATION

Mark the appropriate boxes

2.1 Fire:		2.2 Spill:		2.3 Explosion:		2.4 Gaseous Emission:	
2.5 Injuries		2.6 Reportable injuries:		2.7 Hospitalisation:		2.8 Fatalities:	
2.9 Open water impacts:		2.10 Ground water impacts:		2.11 Atmospheric impacts:		2.12 Soil impacts:	
2.13 Own emergency response involved		2.14 Fire prevention services involved		2.15 Government hazardous materials emergency response involved		2.16 More than 1 governmental emergency response service involved	
2.17 Emission of non-toxic substances at low concentrations		2.18 Emission of non-toxic substances at high concentrations		2.19 Emission of toxic substances at low concentrations		2.20 Emission of toxic substances at high concentrations	
2.21 No evacuation required		2.22 Immediate area evacuated		2.23 Immediate surrounds evacuated		2.24 Evacuation of the general public	
2.25 Others							

3. INITIAL EMERGENCY INCIDENT REPORT

In terms of section 30(3) of NEMA, the responsible person or, where the incident occurred in the course of that person´s employment, his or her employer must forthwith after knowledge of the incident, report through the most effective means reasonably available: (a) the nature of the incident; (b) any risks posed by the incident to public health, safety and property; (c) the toxicity of substances or byproducts released by the incident; and (d) any steps that should be taken in order to avoid or minimise the effects of the incident on public health and the environment to: (i) the Director General; (ii) the South African Police Services and the relevant fire prevention service; (iii) the relevant provincial head of department or municipality; and (iv) all persons whose health may be affected by the incident.

3.1 Description	3.2 Date:	3.3 Time:	3.4 Medium:	3.5. Name and contact details:
Hydro Carbon Spill				
LOCAL :				
PROVINCIAL: (Those deal with Environmental issues)				
DIRECTOR GENERAL: (Department of Environmental Affairs)				
Any other Director General of National Department, E.g. Department of Water Affairs				

4. INCIDENT DETAILS

In terms of NEMA section 30(5)(a) and (d), the responsible person must report on the nature of the incident as well as the causes of the incident, whether direct or indirect, including equipment, technology, system, or management failure

4.1 Location of the incident			
4.2 Incident start date and time:		4.3 Incident duration:	
4.4 Duration of exposure:			

4.5. Incident description:

Background of the incident:
Operation:

Incident type:

Action Taken:

Root Cause of the incident:

Contributory Factors to the incident:

Conclusion:

4.6. Wind speed and direction		4.7. Ambient air temperature	
4.8. Weather conditions		4.9. Other relevant meteorological conditions	

5. POLLUTANTS RELEASED DURING INCIDENT

In terms of NEMA section 30(5)(b), the responsible person must report on the substances involved and an estimation of the quantity.

List all the pollutants directly released during the incident (i.e. exclude those pollutants that resulted from mitigation measures, e.g. flaring, treatment, dilution etc.)

5.1. Substance or mixture of substances	5.2. Reference Number	5.3. Phase eg solid, liquid or gas	5.4. Total Quantity emitted/released	5.5. Units eg Kg, L etc	5.6. Nature of emission/release

6. SECONDARY POLLUTANTS RESULTING FROM INCIDENT

In terms of NEMA section 30(5)(b), the responsible person must report on the substances involved and an estimation of the quantity released.

List all the pollutants that resulted from mitigation measures, e.g. flaring, treatment, dilution etc.

6.1. Substance or mixture of substances	6.2. Reference Number	6.3. Phase	6.4. Total Quantity emitted/released	6.5. Unit	6.6. Nature of emission

7. POLLUTANT CONCENTRATIONS

In terms of NEMA section 30(5)(b), the responsible person must report on the substances involved and an estimation of the quantity released.

List all the pollutants detailed in previous section:

7.1. Substance or mixture of substances	7.2. Reference Number	7.3. Estimated pollutant concentration on different radius			
		7.3.1. 10m	7.3.2. 100m	7.3.3. 500m	7.3.4. >2000m
[The name recognised by any national or internationally recognised chemical referencing system]	[Reference to any national or internationally recognised chemical referencing system]	[estimate the concentration of the pollutant in water, soil and/or air within a 10m radius of the epicentre of the incident] [provide the units used in a case of estimating concentration (e.g. ppm]	[estimate the concentration of the pollutant in water, soil and/or air within a 100m radius of the epicentre of the incident] [provide the units used in a case of estimating concentration (e.g. ppm)]	[estimate the concentration of the pollutant in water, soil and/or air within a 500m radius of the epicentre of the incident] [provide the units used in a case of estimating concentration (e.g. ppm)]	[estimate the concentration of the pollutant in water, soil and/or air within a > 2000 m radius of the epicentre of the incident] [provide the units used in a case of estimating concentration (e.g. ppm)]

[1] Concentration at the plume

[2] Concentration that was falling on the ground

8. INCIDENT IMPACT

In terms of NEMA section 30(5)(b), the responsible person must report on possible acute effects on persons and the environment and the responsible must provide data needed to assess these effects;

8.1. Minor injuries	
8.2. Reportable injuries	
8.3. Hospitalisation	
8.4. Fatalities	
8.5. Biological impacts	
8.6. Impact area	
8.7. Data	

9. EXISTING PREVENTION PROCEDURES AND/OR SYSTEMS

9.1. Foresight	[Briefly describe whether the incident could have, or had, been foreseen, e.g. was it included in any environmental impact assessment, risk assessment, health and safety plan, etc.]
9.2. Procedures and/or systems	Attach any relevant safety, health and environmental plans (including any statutory planning requirements) that detail what actions should be taken in the event of the incident that is the subject of this report
9.3. Procedure and/or systems failures	[Describe any failures or shortfalls in procedures and/or systems that may have contributed to the incident] *All procedures and checklist in place and signed off.*
9.4. Technical measures	[Describe any technical measures, equipment, 'fail-safe' devices, etc. that are in place to prevent the occurrence of the incident] Communications & discussions in place.
9.5. Technical failure	[Describe any failures of technical measures, equipment, 'fail-safe' devices, etc. that are in place to prevent the occurrence of the incident]

10. INITIAL INCIDENT MANAGEMENT

In terms of NEMA section 30(5)(c), the responsible person must report on initial measures taken to minimise impacts.

10.1. Evacuation	N/A
10.2. Technical measures	
10.3. Mitigation measures	[Describe all measures taken to minimize the impact] *SOPEP gear activated*
10.4. Emergency Services	[Describe any governmental emergency services involvement] *SAMSA/TNPA advised*

11. CLEANUP AND/OR DECONTAMINATION

In terms of NEMA section 30(5)(c), the responsible person must report on initial measures taken to minimise impacts.

11.1. Cleanup and/or decontamination	

11.2. Permissions and Instructions

Provide details of any permission and/or instructions received from any organ of state during initial incident management, cleanup and/or decontamination

11.3. Type	11.4. Statute	11.5. Issued By	11.6. Name and contact details

12. MITIGATION MEASURES

In terms of NEMA section 30(5)(e), the responsible person must report on measures taken and to be taken to avoid a recurrence of such an incident.

12.1. Measure	12.2. Objective	12.3. Cost	12.4. Timing
[Briefly describe each of the measures taken, and to be taken, to avoid a recurrence of such incident]	[Briefly describe the objective of the measure, i.e. the desired outcome of the measure]	[Estimate the cost of the measure in terms of capital costs and/or recurrent costs]	[Provide information on the timing for the full implementation of the measure]

12. MITIGATION MEASURES

In terms of NEMA section 30(5)(e), the responsible person must report on measures taken and to be taken to avoid a recurrence of such an incident.

12.1. Measure	12.2. Objective	12.3. Cost	12.4. Timing

13. AUTHORISATIONS

Provide details on all authorisations (including permits, licenses, certificates, etc.) in respect of the activity to which this incident relates.

13.1. Type	13.2. Statute	13.3. Issued By	13.4. Issue & Expiry Date
[Describe the nature or type of authorisation, e.g. Registration Certificate]	[Provide the reference for the authorisation, e.g. section X of the National Environmental Management Act (Act No. 107 of 1989)]	[Provide contact details for the issuing authority]	[provide the date of issue and expiry]

14. HISTORY

Provide details of all similar incidents involving the responsible person in the past (i.e. from 1998). Similar incidents include those that: (i) involved similar circumstances; (ii) involved similar emissions; (iii) involved similar personnel; and/or (iv) involved similar impacts.

14.1. Incident title	14.2. Report reference	14.3. Date of incident	14.4. Summary of event
[Provide the title used in the relevant emergency incident report]	[Provide the reference in respect of the relevant emergency incident report]	[Date of incident]	[Provide a summary of the event]

Signed by, or as a mandated signatory for, the responsible person:		Date:	

APPENDIX 1
List of affected people as results of the incident

NAME	ADDRESS	PHONE	FAULT	REMARKS

APPENDIX 2
Layout map of the area likely to be affected or affected as a result of the incident

Disclaimer

Any other information not covered in the reporting template must be included.

CAUTION

In terms of section 30 (11) of NEMA as amended, it is an offence not to report an incident and liable on convection to a fine not exceeding R 1 million or imprisonment for a period not exceeding 1 year, or to both such a fine and such imprisonment.