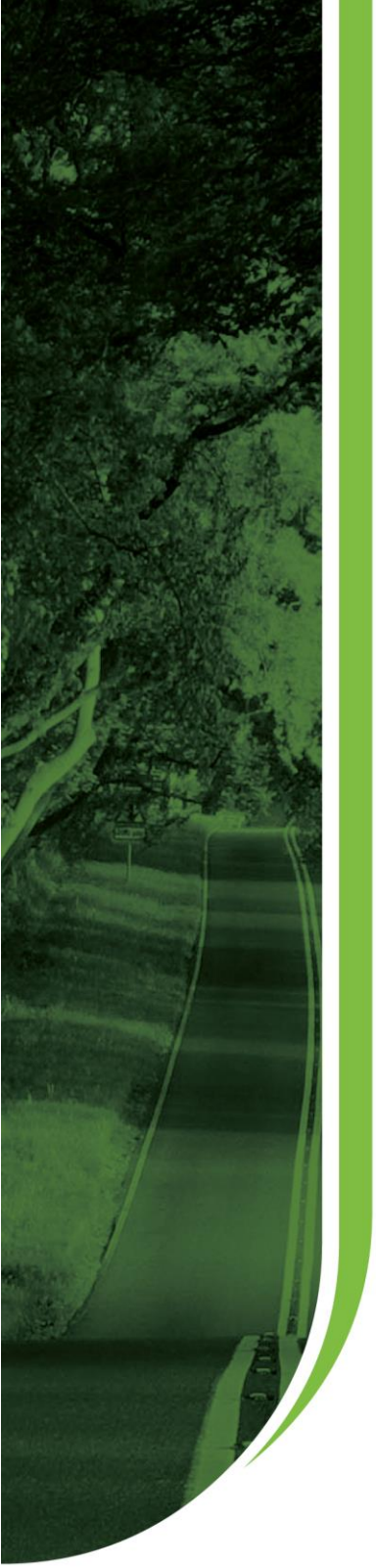

PROPOSED CONSTRUCTION OF POTABLE WATER PIPELINES NEAR NOENIEPUT, NORTHERN CAPE.

Environmental Management Plan

July 2020

Prepared for:

KALAHARI EAST WATER USERS ASSOCIATION

Prepared by:

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	Issue 1	Revision 1	Revision 2
Issue/Revision Name	EMP FOR THE PROPOSED CONSTRUCTION OF POTABLE WATER PIPELINES NEAR NOENIEPUT, NORTHERN CAPE.	EMP FOR THE PROPOSED CONSTRUCTION OF POTABLE WATER PIPELINES NEAR NOENIEPUT, NORTHERN CAPE.	
Report prepared/revised by:	**Thandeka Moabi**	**Christoff du Plessis**	
Date:	**March 2020**	**March 2020**	
Signature:			

TABLE OF CONTENTS

1 INTRODUCTION 1
1.1 NEMA Regulation 19(4) Report Compliance 1
1.2 Report Layout 3
2 MAP OF THE PROPOSED ACTIVITY 4
3 ENVIRONMENTAL ASSESSMENT PRACTITIONER 6
3.1 Details of the EAP 6
3.2 Expertise of the EAP 6
3.3 Curriculum Vitae of the EAP 7
4 PROJECT DESCRIPTION AND LISTED ACTIVITIES COVERED BY THIS EMP-R 8
4.1 Brief Project Description 8
4.2 Project Phases ..... **Error! Bookmark not defined.**
4.3 NEMA Listed Activities Triggered ..... **Error! Bookmark not defined.**
5 EXISTING ENVIRONMENTAL AND IMPACT ASSESSMENT SUMMARY 9
5.1 The Receiving Environment 10
5.2 Public Participation 10
5.3 Specialist Investigations 10
5.4 Environmental Impact Ratings 12
6 RECOMMENDATIONS OF THE EAP 26
7 PERSONS RESPONSIBLE FOR IMPLEMENTING THIS EMPR 27
7.1 On-site Communication 28
7.1.1 Site Instruction Entries 28
7.1.2 Method Statements 28
7.1.3 Record Keeping 29
7.2 Monitoring 29
7.3 Performance Assessment and Reporting on EMP'r Compliance 29
7.3.1 ECO Site Inspection Reports 30
7.3.2 Photographs 30
8 ENVIRONMENTAL AWARENESS PLAN 31
8.1 Environmental Awareness and Risk Training 31
8.1.1 Basic Rules of Conduct 31
9 IMPACTS AND MITIGATION MEASURES 32
9.1 Construction Phase Environmental Management Programme 33
9.2 Operational Phase Environmental Management Programme 55
9.3 Impacts during the Decommissioning Phase 65

10 EMERGENCY RESPONSE PLAN 66

11 INCIDENT REGISTER 67

12 REHABILITATION MEASURES AND CLOSURE PLAN 68

12.1 Rehabilitation Measures 68

LIST OF TABLES

Table 1: Environmental Management Programme requirements in terms of Regulation 19(4) of the EIA Regulations of 2014. 3

Table 2: Summary of report content layout. 3

Table 3: Listed Activities applicable to this application. 9

LIST OF FIGURES

No table of figures entries found.

LIST OF ACRONYMS AND ABBREVIATIONS

CER	-	Contractors Environmental Representatives
DEA	-	Department of Environmental Affairs
DEA&DP	-	Department of Environmental Affairs and Development Planning
DWS	-	Department of Water and Sanitation
ECO	-	Environmental Control Officer
EIA	-	Environmental Impact Assessment
EIR	-	Environmental Impact Report
EMP'r	-	Environmental Management Program Report
EPC	-	Engineering Procurement Contractor
I&AP's	-	Interested and Affected Parties
IDP	-	Integrated Development Plan
NEMA	-	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMBA	-	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NHRA	-	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NSBA	-	National Spatial Biodiversity Assessment
NERSA	-	National Energy Regulator of South Africa
NWA	-	National Water Act, 1998 (Act No. 36 of 1998)
PHRA	-	Provincial Heritage Resources Agency
PPP	-	Public Participation Process
SAHRA	-	South African Heritage Resources Agency
SDF	-	Spatial Development Framework

GLOSSARY OF TERMS

Alien species: A plant or animal species introduced from elsewhere: neither endemic nor indigenous.

Applicant: Any person who applies for an authorisation to undertake an activity or undertake an Environmental Process in terms of the Environmental Impact Assessment Regulations – National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) as contemplated in the scheduled activities listed in Government Notice (GN) No R. 983, 984 and 985.

Biodiversity: The variety of life in an area, including the number of different species, the genetic wealth within each species, and the natural areas where they are found.

Cumulative Impact: In relation to an activity, cumulative impact means the impact of an activity that in it-self may not be significant, but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

Ecology: The study of the interrelationships between organisms and their environments.

Environment: All physical, chemical and biological factors and conditions that influence an object.

Environmental Impact Assessment: In relation to an application, to which Scoping must be applied, means the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of the application.

Environmental Impact Report: In-depth assessment of impacts associated with a proposed development. This forms the second phase of an Environmental Impact Assessment and follows on from the Scoping Report.

Environmental Management Programme: A legally binding working document, which stipulates environmental and socio-economic mitigation measures that must be implemented by several responsible parties throughout the duration of the proposed project.

Heritage resources: This means any place or object of cultural significance. See also archaeological resources above

Precipitation: Any form of water, such as rain, snow, sleet, or hail that falls to the earth's surface.

Red Data species: All those species included in the categories of endangered, vulnerable or rare, as defined by the International Union for the Conservation of Nature and Natural Resources.

Riparian: The area of land adjacent to a stream or river that is influenced by stream induced or related processes.

Soil compaction: Soil becoming dense by blows, vehicle passage or other type of loading. Wet soils compact easier than moist or dry soils.

1 INTRODUCTION

This Environmental Management Programme (EMPr), amongst others, describes the mitigation measures and identifies the specific role players that will be responsible for implementation of the mitigation measures, in order to ensure that impacts on the environment are minimised during the construction, operational and decommissioning phases of the proposed construction of potable water pipelines near Noenieput, Northern Cape.

This EMP'r must form part of the contractual agreement between the contractor(s) and the developer.

1.1 NEMA Regulation 19(4) Report Compliance

Regulation 19(4) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) Environmental Impact Assessment (EIA) Regulations of 2017 provides the content requirements for Environmental Management Programmes. The table below lists the relevant requirements, indicates whether the relevant information is included in this report or not, and provides cross-references as to where the relevant information can be found in this report.

Reg.	EMP'r Content	Included (Yes, No or N/A)	Report Section Reference
(a)	A draft environmental management programme must comply with section 24N of the Act and include - details of:		
	(i) the person who prepared the environmental management programme; and	**Yes**	**Chapter 3**
	(ii) the expertise of that person to prepare an environmental management programme;	**Yes**	**Chapter 3**
(b)	A detailed description of the aspects of the activity that are covered by the EMP'r as identified by the project description;	**Yes**	**Chapter 4**
(c)	A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;	**Yes**	**Chapter 2**

Reg.	EMP'r Content	Included (Yes, No or N/A)	Report Section Reference
(d)	A description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including – (i) planning and design; (ii) pre-construction activities; (iii) construction activities; (iv) rehabilitation of the environment after construction and where applicable post closure; and, (v) where relevant, operation activities;	**Yes**	**Chapter 9**
(e)	A description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);	**Yes**	**Chapters 7 and 9**
(f)	A description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to – (i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) comply with any prescribed environmental management standards or practices; (iii) comply with any applicable provisions of the Act regarding closure, where applicable; and, (iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;	**Yes**	**Chapter 9**
(g)	The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	**YES**	**Chapter 9**
(h)	The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	**YES**	**Chapter 7**
(i)	An indication of the persons who will be responsible for the implementation of the impact management actions;	**YES**	**Chapter 9**
(j)	The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	-	-
(k)	The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	**YES**	**Chapter 9**
(l)	A program for reporting on compliance, taking into account the requirements as prescribed by Regulations;	**YES**	**Chapter 7**
(m)	An environmental awareness plan describing the manner in which – (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and, (ii) risk must be dealt with in order to avoid pollution or the degradation of the environment; and,	**YES**	**Chapter 8**

Reg.	EMP'r Content	Included (Yes, No or N/A)	Report Section Reference
(n)	Any specific information that may be required by the Competent Authority.	-	-

Table 1: Environmental Management Programme requirements in terms of Regulation 19(4) of the EIA Regulations of 2014.

1.2 Report Layout

The table below summarises the content layout of this report.

Chapter	Chapter Heading	Content Summary
1	Introduction	Provides a brief background to the proposed project, and explains the compliance of this report with regards to Regulation 33 of the NEMA.
2	Environmental Assessment Practitioner	Provides details of the EAP who prepared this EMP'r, and provides information on the expertise of the EAP.
3	Project Description and Listed Activities Covered by this EMPr	Provides a brief project description, and describes the relevant project phases and the NEMA Listed Activities triggered.
4	Existing Environmental and Impact Assessment Summary	Summarises the biophysical, social, economic and cultural aspects of the existing environment, and provides a summary of the impact assessment outcome.
5	Persons Responsible for Implementing this EMP'r	Provides information on the persons who will be responsible for implementing this EMP'r, and explains requirements with regards to on-site communication, site instruction entries, method statements, and record keeping.
6	Monitoring, Performance Assessment and Reporting on EMP'r Compliance	Provides information on monitoring, performance assessment and reporting on EMP'r Compliance, ECO site inspection reports, and photographs.
7	Environmental Awareness Plan	Provides information on environmental awareness and risk training, and basic rules of conduct. Also provides an environmental risk plan.
8	Impacts and Mitigation Measures	Provides EMP'rs for the relevant project phases.
9	Emergency Response Plan	Provides information on the emergency response plan.
10	Incident Register	Stipulates the content requirements for incident registers.
11	Rehabilitation Measures and Closure Plan	Provides rehabilitation measures and closure plan objectives.
12	Prevent Triggering of Further Listed Activities	Warns the proponent not to contravene the NEMA by engaging in unauthorised NEMA Listed Activities.
13	References	Lists all references referred to in this EMP'r.

Table 2: Summary of report content layout.

2 MAP OF THE PROPOSED ACTIVITY

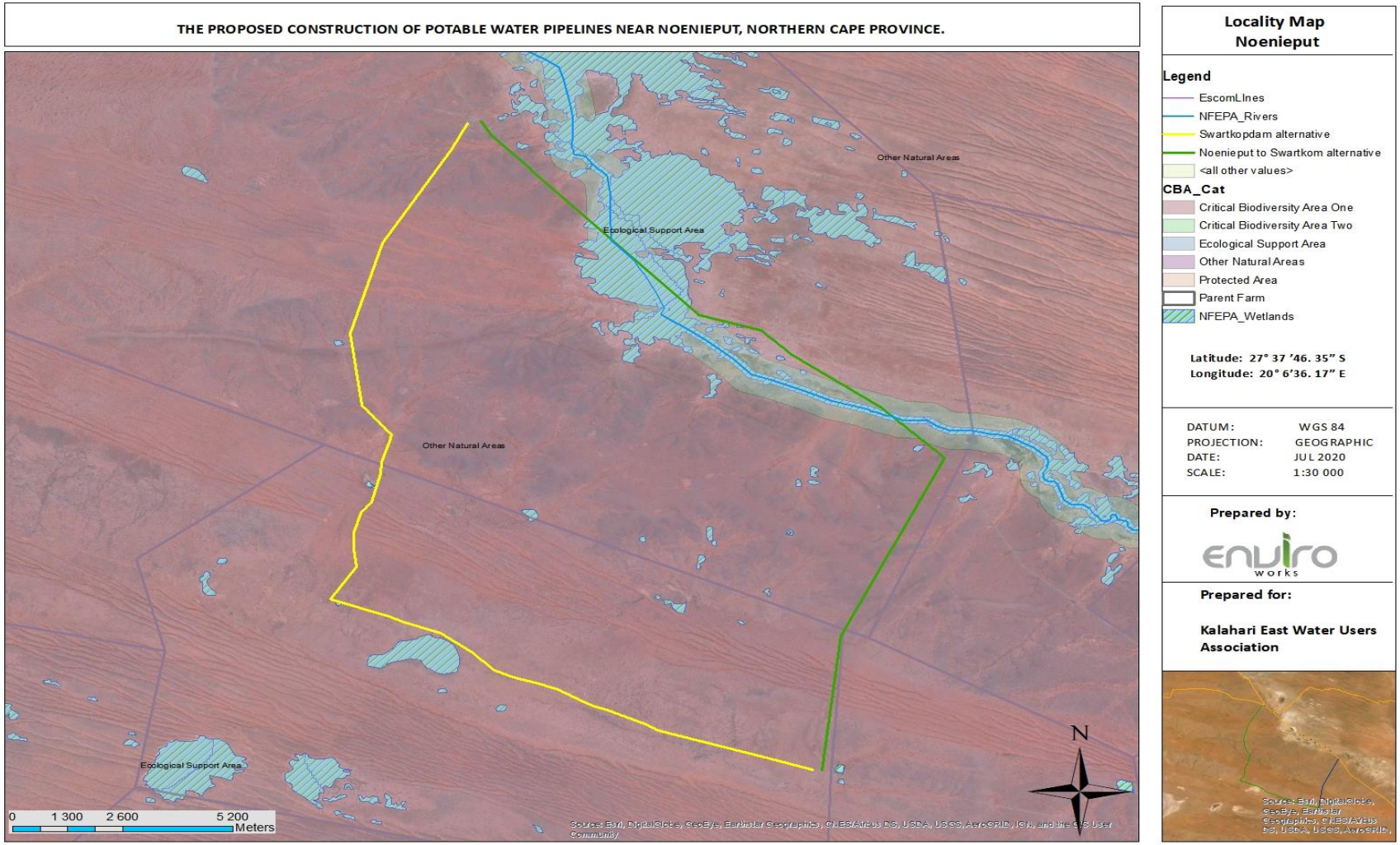

Figure **1**: Sensitivity Map

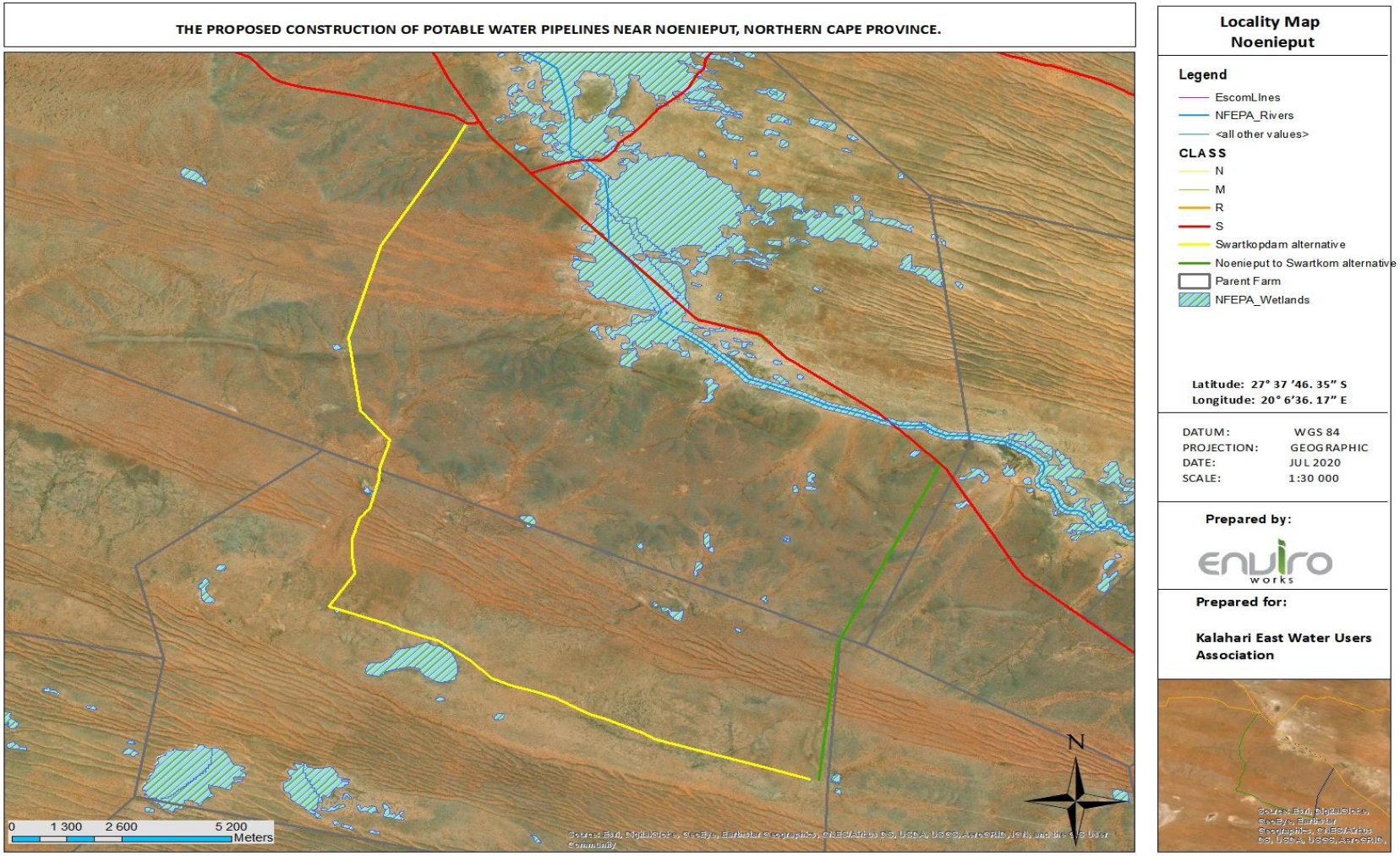

Figure **2**: Locality Map

ENVIRONMENTAL ASSESSMENT PRACTITIONER

This Environmental Management Programme Report was prepared by Thandeka Moabi from Enviroworks, the Environmental Assessment Practitioner (EAP) who is undertaking this EIA process. The sections below provide the details of the EAP, and explain the EAP's expertise to prepare this EMP'r.

Details of the EAP

Business name of EAP:	Enviroworks
Physical address:	4 Coligny Road , Parkwest , Bloemfontein, 9301
Postal address:	Suite 116, Private Bag X01, Brandhof,
Postal code:	9324
Telephone:	051 436 0793
E-mail:	thandeka@enviroworks.co.za
Fax:	086 601 7507

Expertise of the EAP

Name of EAP	Education qualifications	Professional affiliations	Experience at environmental assessments (yrs)
Thandeka Moabi	B.A Geography and Environmental Management	IAIA: 6277	2 years

Curriculum Vitae of the EAP

Suite 116 Private Bag X01, Brandhof, Bloemfontein, 9324

4 Coligny Road, Parkwest, Bloemfontein, 9301

Cell: 0735046337|Tel:0514360793|Fax:086 853 0682

thandeka@enviroworks.co.za|www.enviroworks.co.za

Thandeka Moabi

Relevant Qualifications

B.A Geography and Environmental Management: University of the Free State (2016)

Environmental Impact Assessment for Practitioners : North-west University (2018)

Work Experience

August 2018 – Present Environmental Consultant at Enviroworks

Key Project Experience

Basic Assessment Experience

- Hydroponics Project, LMC Farms, North West Province
- The periodic maintenance of tr1/2, tr1/3, tr44/1, tr88/1, mr401 and mr402, near Uniondale, Western Cape Province
- Willie Bheaurrain Composting Facility, Gauteng Province

Environmental Control Officer (ECO)

Vista Park ECO Inspections, Bloemfontein

Experience in Permits and Licencing

- Water Use License for BloemSkou, Bloemfontein, Free State.
- Water Use License for LMC Farms, Hydroponics Project, Molote City, North West.
- Water Use License for ClinVet International pty (Ltd)

Environmental Management Plans

- Lafarge Olive Hill Quarry EMP Review

PROJECT DESCRIPTION AND LISTED ACTIVITIES COVERED BY THIS EMPr

Brief Project Description

The Kalahari- East Users Association proposes the construction of a portable water supply pipeline (approximately 25km) in Noenieput, Northern Cape Province. The connection point will be at Noenieput where the water supply pipeline that is currently under construction terminates. The water will flow from the connection point at Noenieput to Swartkopdam. Connection points will be provided for small and commercial farmers along the pipeline route. The approximate usage per month is 0.9l/s at peak summer demand.

The pipeline material is UPVC of various pipe classes and diameters (110-160mm). The pipeline shall be installed in a trench with at least 600mm cover above the pipe. At the two crossings of the Molopo River the pipe cover will be 1.2 meters. Noenieput is located approximately 160km northwest of Upington within the ZF Mgcawu District Municipality in the Northern Cape Province.

The NEMA EIA Listed Activities (as per the NEMA EIA Regulations Listing Notices 1, 2 and 3 of 2017) that will most likely be triggered by the proposed project are listed in the table below.

Listed Activity	Project Activity / Component
Government Notice Regulation No. 324 of 2017 (Listing Notice 1)	
Activity 12	The development of – (xi) infrastructure or structures with a physical footprint of 100 m2 or more; where such development occurs – (c) if no development setback exists, within 32 m of a watercourse, measured from the edge of the watercourse; excluding – (ee) where such development occurs within existing roads or road reserves.
Activity 19	The infilling or depositing of any material of more than 5 m3 into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 m3 from – (i) a watercourse.

Government Notice Regulation No. 324 of 2017 (Listing Notice 3)	
Activity 14	The development of – (xii) infrastructure or structures with a physical footprint of 10 m2 or more, where such infrastructure occurs – (a) within a watercourse; (c) if no development setback has been adopted, within 32 m of a watercourse, measured from the edge of the watercourse; (a) In Northern Cape
Activity 12	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.

Table 3: Listed Activities applicable to this application.

EXISTING ENVIRONMENTAL AND IMPACT ASSESSMENT SUMMARY

The sections below summarise the existing environment, and the outcome of the impact assessment that was undertaken for the proposed project.

The Receiving Environment

Noenieput is located approximately 160km northwest of Upington within the ZF Mgcawu District Municipality in the Northern Cape Province.

Public Participation

To support public interest and inform the EIA process, a public consultation process will proceed throughout the lifetime assessment. A diverse mix of authorities, stakeholders and interested and affected parties will be consulted during this time, representing the environment, social, economic and political realms of local and regional and national bodies.

Comments will be responded to during various stages of the public participation process in the Basic Assessment and will be addressed in project reports as relevant. It is considered that through public participation conducted by the EAP, parties will have adequate opportunity to partake in this process and all concerns will be addressed to ensure that all parties are in agreement with the proposed development.

Specialist Investigations

Heritage Impact Assessment

National Heritage Resources Act 25 of 1999:

Section 38(1): Subject to the provision of subsections (7), (8) and (9), any person who intends to undertake a development categorised as –

(a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length.

Triggering reason: The proposed project will cover a distance of 25 000 m

Heritage Impact Assessment:

The preferred alternative: This alignment is preferred in terms of other environmental indicators and is preferred in terms of impacts to archaeological heritage resources as the archaeological resources identified along this alignment are of moderate to low local significance(Grade IIIB and Grade IIIC), and impacts to these resources can be mitigated. However, this alignment has very HIGH sensitivity in terms of impacts to

significant palaeontological heritage with chances of poorly known Cambrian trace fossils in the Nababis Formation and such, is not preferred in terms of impacts to palaeontology.

The alternative Site: This alternative is not preferred in terms of impacts to archaeological heritage. The field assessment identified a number of significant archaeological resources of high local significance (Grade IIIA) within this alignment which must not be impacted by the proposed development. However, this alignment has LOW to MODERATE sensitivity for impacts to palaeontological heritage with a low chance of fossil remains in the Dwyka Tillites and a high chance of these being metamorphosed.

Please refer to Appendix D for the Phase 1 Heritage Impact Assessment.

Ecological Impact Assessment

A site visit took place on the 24 March 2020 to assess the Preferred Alternative. A walkthrough was done, assessing environmental conditions and pictures were taken of the environment and plant species. The site visits took place in late summer at the end of the rainy season, when most species were in flower. The weather conditions were accommodating, where clear visibility facilitated the inspection of the facility and surrounding vegetation.

The entire pipeline footprint could not be surveyed during the site visit. Instead, 100m transects were sampled every 2 km, and opportunistic observations were made at watercourses. This is thought to give a relatively good representative sample of the vegetation type and species that occurs within the proposed route footprint.

The proposed alternatives traverses two vegetation types, namely Kalahari Karroid Shrubland, alternating with Gordonia Duneveld (Figure 8) (ecological report). The distribution of the two vegetation types correspond with the Plant Species Theme in Figure 7 (ecological report). Thus, the Kalahari Karroid Shrubland is classified as having a medium plant sensitivity and Gordonia Duneveld has a low plant sensitivity. The Kalahari Karroid Shrubland vegetation type is distributed within the Northern Cape Province. It typically forms belts alternating with belts of Gordonia Duneveld on plains northwest of Upington through Lutzputs and Noenieput to the Rietfontein/Mier area in the north. Other patches occur around Kakamas and north of Groblershoop. The unit is also found in the neighbouring Namibia. Altitude varies mostly from 700–1 100 m. The unit is characterised by low karroid shrubland on flat, gravel plains. Karoo-related elements (shrubs) meet here with northern floristic elements, indicating a transition to the Kalahari region and sandy soils. The vegetation type is classified as Least Threatened. Very little of the unit is statutorily conserved in Augrabies Falls National Park. Although only a small area has been transformed many of the belts of this type were preferred routes for early roads, thus promoting the introduction of alien plants (about a quarter of the unit has scattered Prosopis species). Erosion potential is very low for this unit (Mucina et al., 2006)

Environmental Impact Ratings

POTENTIAL IMPACTS DURING THE CONSTRUCTION PHASE

Planning, Design and Construction Phase	Alternative 1		No-Go Alternative
	Before Mitigation	After mitigation	
POTENTIAL IMPACTS ON GEOGRAPHICAL AND PHYSICAL ASPECTS:			
Nature of Impact: Negative impact of haphazard placement of infrastructure on the environment.	**Activity:** The establishment of a main site office and storage site during the construction period will ensure that the poor placement of materials and infrastructure will be avoided. This could also result in the damage or pollution to surrounding areas caused by construction activities		No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance Rating:	Medium	Low	-
Cumulative Impact:	-	-	-
Proposed Mitigation:	• Draw up and submit for approval a Site Layout Master Plan. This plan must show the final positions and extent of all permanent and temporary site structures and infrastructure; • The planning for layout must be done in consultation on-site with the Environmental Control Officer (ECO); • Locate all structures and storage areas, including offices, workshops and stores in approved locations as per the site layout plan; • After the final layout has been approved, conduct a thorough footprint investigation to detect and map (by GPS) any protected plant species and animal burrows; • The contractor may not deface, paint, damage or mark any natural features situated in or around the site for survey or other purposes; • The contractor must ensure that all construction personnel, labourers and equipment remain within the demarcated construction sites at all times; • No servicing of vehicles may be permitted on site, unless for emergency purposes; • Stockpiles should not be situated such that they obstruct pathways; • Location of storage area must take into account prevailing winds, distance to water bodies and general on-site topography; • Protected Plant Species must be relocated (where possible); • Animal burrows must be monitored by the Environmental Control Officer (ECO) prior to construction for activity/presence of animal species. If detected, such animals must be removed and relocated by a qualified professional/contractor; • Place infrastructure as far as possible on sites that have already been transformed; and, • Facilities may not be used as staff accommodation.		-

Planning, Design and Construction Phase	Alternative 1		No-Go Alternative
	Before Mitigation	After mitigation	
Nature of Impact: Soil and Geology	**Activity**: The clearing of topsoil and excavation for the establishment of administration offices, security guard rooms etc.		No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance Rating:	Medium – High	Low	-
Cumulative Impact:			-
Proposed Mitigation:	• Remove topsoil approximately 300mm deep from establishment area and stockpile areas; • Topsoil stockpiles to be kept free from weeds; • Topsoil stockpiles to be placed on a levelled area and measures to be implemented to safeguard the piles from being washed away in the event of heavy rain/storm water; • Topsoil need to be stored on designated areas only. This need to be planned and indicated in the site-layout plan; • Strip and stockpile herbaceous vegetation, overlying grass and fine organic matter along with the topsoil; • Ensure that topsoil is not mixed with subsoil and/or any other excavated material; • Provide containment and settlement facilities for effluents from concrete mixing and washing facilities; • Temporarily stored topsoil must be re-applied within 6 months, topsoil stored for longer need to be managed according to a detailed topsoil management plan; • Do not strip topsoil when it is wet; • Provide spill containment facilities for hazardous materials like fuel and oil; and, • Topsoil must be used in all rehabilitation activities, and may not be compacted to ensure that its plant support capacity remain of high quality.		-
Nature of Impact: Soil, Surface and groundwater contamination due to construction activities such as the use of hazardous materials on site e.g. fuel and oil.	**Activity:** Construction camp site establishment, construction of stormwater infrastructure movement of vehicles and use of construction heavy machinery can cause spillages on site. And mismanagement of construction waste and hazardous substances resulting in these substances entering and polluting natural environments either directly through surface runoff, or subsurface water movement.		No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance Rating:	Medium-HIGH	Low	-
Cumulative Impact:	-	-	-
Proposed Mitigation:	• No washing of concrete mixing and pouring equipment or any object that is contaminated with cement in any water resource. No concrete mixing trucks must be washed on site; they must return to the supplier for cleaning out.		

Planning, Design and Construction Phase	Alternative 1		No-Go Alternative
	Before Mitigation	After mitigation	
	• Concrete can be mixed on mixing trays only and not on exposed soil. Concrete must be mixed only in areas which have been specially demarcated for this purpose (preferable where no natural vegetation occur); • Concrete mixing to be carried out away from sensitive areas and on impermeable surfaces; • Material Safety Data Sheets (MSDSs) should be available on site for all chemicals and hazardous substances to be used on-site, including information on their ecological impacts and how to minimise the impacts in case of leakage; • All spillage must be cleaned up immediately after they have occurred; • Spillage of petrochemical products must be avoided. In the case of accidental spillage, contaminated soil must be removed for bioremediation or disposed of at a facility for the substance concerned. Disturbed land must be rehabilitated and seeded with vegetation seed naturally occurring on site; • Do not locate any ablution facilities, sanitary convenience, septic tank or French drain within the 1:100 year flood line, or within a horizontal distance of 100m (whichever is greater) of a watercourse or drainage line; • Vehicles and machinery must be regularly serviced to avoid leakages; • No vehicles may be parked within 100m from a watercourse; • No uncontrolled discharges from the site or working area to depressions may be permitted. All discharge points will require approval from the Environmental Site Agent (ESA); •		
Nature of Impact: Road safety and disturbance of traffic	**Activity:** Temporary disturbance for movement of pedestrians and vehicular traffic in the area.		No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance Rating:	Low	Low	-
Cumulative Impact:	-	-	-
Proposed Mitigation:	• The necessary traffic safety warning signage must be erected during construction as per the engineers' specifications to warn motorists and pedestrians of the potential dangers of the construction site • The necessary traffic safety warning signage must be erected during construction as per the engineers' specifications to warn motorists and pedestrians of the potential dangers of the construction site • Share information prior to projects beginning. Warning commuters before the construction starts gives them an opportunity to think about alternate routes to their destination. Warning messages, a week or two prior to the start date is a good benchmark. • Advice motorists to use alternative routes, especially in the mornings and during the rush/pick up hours in the afternoon to avoid traffic congestions.		

Planning, Design and Construction Phase	Alternative 1		No-Go Alternative
	Before Mitigation	After mitigation	
Nature of Impact: Uncontrollable fire outbreak	**Activity:** Due to the presence of construction personnel in natural areas, fires can occur if not managed correctly.		No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance Rating:	Medium	Low	
Cumulative Impact:	-	-	
Proposed Mitigation:	• The potential risk of veld fires are heightened by windy conditions in the area, specifically during the dry, windy summer months; • Ensure the work site and the contractor's camp is equipped with adequate firefighting equipment. This includes at least rubber beaters when working in veldt areas, and at least one fire extinguisher of the appropriate type irrespective of the site; • Workers must be adequately trained in the handling of firefighting equipment; • No open fires are permitted anywhere on site. • Do not store any fuel or chemicals under trees; • Do not store gas and liquid fuel in the same storage area (Hazardous substances to be stored in accordance with SANS); • The Contractor should ensure that construction related activities that pose a potential fire risk, such as welding, heating of bitumen etc., are properly managed and confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include clearing working stations and avoid working in high wind speed conditions when the risk of fires is greater; • No smoking is allowed near any natural areas; • Do not permit any smoking within 3m of any fuel or chemical storage area, or refueling area. A designated smoking area must be established on site; and, • All construction vehicles must be fitted with at least one fire extinguisher.		

Planning, Design and Construction Phase	Alternative 1		No-Go Alternative
	Before Mitigation	After mitigation	
POTENTIAL IMPACTS ON BIOLOGICAL ASPECTS:			
Nature of Impact: Destruction of terrestrial fauna species	**Activity:** Potential to destroy to disturb, harm or injure faunal species (especially species with limited mobility) inhabiting the sites directly, reduce habitat and species diversity and disruption of access to grazing and crop areas.		No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance Rating:	Medium	Low	-
Cumulative Impact:	-	-	-

Planning, Design and Construction Phase	Alternative 1		No-Go Alternative
	Before Mitigation	After mitigation	
Proposed Mitigation:	• Selected workers must be given training on the possible fauna that may be encountered along the road under maintenance. • Site workers are to be informed of any sensitive fauna on the site prior to construction activities commencing and be informed that poaching or disturbance is strictly prohibited. • Under no circumstances shall any fauna be handled, removed, killed or interfered with by the Proponent, Project Manager, Resident Engineer, contractors, engineers, and their employees, including subcontractors or their subcontractors' employees. However, if construction activities are likely to injure, kill or interfere with any fauna encountered on the site, appropriate action must be taken to ensure their protection. • Any fauna found within the construction corridor must be moved to the closest point of natural or semi-natural vegetation outside the construction servitude. This includes those species perceived to be vermin (such as snakes and rats). The latter species may require the services of a specialist to catch and relocate dangerous/venomous species.		-
Significance Rating:	Medium	Low	-
Cumulative Impact:	-	-	-
Proposed Mitigation:	• After the final layout has been approved, conduct a thorough footprint investigation (walk-through) to detect and map (by GPS) all protected plant species, which have to be removed and animal, burrows, present within the project site. • Animal burrows must be monitored by the ECO prior to construction for activity/presence of animal species. If detected, such animals must be removed and relocated by a qualified professional/contractor; • During construction create designated turning areas and strictly prohibit any off-road driving or parking of vehicles and machinery outside designated areas; • Ensure that runoff from compacted or sealed surfaces is slowed down and dispersed sufficiently to prevent accelerated erosion from being initiated (storm water and erosion management plan required); • Ensure adequate drainage where roads cross drainage lines or ephemeral tributaries; • Monitor the establishment of (alien) invasive species and remove as soon as detected, before regenerative material can be formed; • Abnormal loads and machinery should avoid movement over gravel roads during and immediately after rainfall events, so as to limit destruction of road surfaces and sedimentation of downhill rivers/streams; • All vehicles must be road-worthy, be maintained to prevent fuel or oil leaks and drivers are to the licensed appropriately for the driving of their assigned vehicle. Drivers responsible for the transportation of personnel must be specifically licensed to do so; • Construction vehicles may not leave the designated roads and tracks, whilst U-Turns are prohibited on all roads; • Signage is to be placed on vehicles at all times; • All construction vehicles should adhere to construction sites and avoid off road to minimise impact on vegetation and soil;		-

Planning, Design and Construction Phase	Alternative 1		No-Go Alternative
	Before Mitigation	After mitigation	
	• Construction Vehicles may not be parked in the road reserve, specific parking areas must be identified prior to construction and these areas must be inspected to ensure no red data species occur; • After decommissioning, if access roads or portions thereof will not be of further use to the landowner, remove all foreign material and rip area to facilitate the establishment of vegetation, followed by a suitable revegetation program; and, • Construction-related vehicles and machinery may not operate on site without reflective safety signage, car-top lights and reflective personnel gear.		
Nature of Impact: Destruction of vegetation cover	**Activity:** The construction of several permanent structures on site will result in the loss of vegetation due to foundation excavation.		No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance Rating:	Medium- high	Low	-
Cumulative Impact:	-	-	-
Proposed Mitigation:	• After the final layout has been approved, conduct a thorough footprint investigation to detect and map (by GPS) any protected plant species and active animal burrows; • Protected plant species must be relocated where possible; • Keep areas affected to a minimum, strictly prohibit any disturbance outside the demarcated construction footprint area; • Clear as little indigenous vegetation as possible, aim to maintain vegetation where it will not interfere with the construction or operation of the development, rehabilitate an acceptable vegetation layer according to rehabilitation recommendations of the relevant EMP'r, if possible; • Indigenous vegetation unique to the area must be used during landscaping activities; • There should be a preconstruction environmental induction for all construction staff on site to ensure that basic environmental biodiversity principles are adhered to; • Where the ECO deems it necessary (e.g. sensitive, natural areas) the ecologist appointed to do the vegetation study will be utilized; • No vehicles may be parked within the road reserve, designated parking areas must be identified during the planning phases; • Restoration measures will be required to reinstate functionality in the disturbed soil and vegetation;		-

Planning, Design and Construction Phase	Alternative 1		No-Go Alternative
	Before Mitigation	After mitigation	
	• Impacts to sensitive sites (drainage lines) should be avoided; • No vegetation may be gathered for the purpose of creating fire; and, • No fires are allowed on site.		

Planning, Design and Construction Phase	Alternative 1		No-Go Alternative
	Before Mitigation	After mitigation	
POTENTIAL IMPACTS ON SOCIO-ECONOMIC ASPECTS:			
Nature of Impact: Employment creation during construction period	**Activity:** During the construction period of the project people will be employed especially those residing in the area of Noenieput.		• No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken. • No construction will result in no job creation within the Local Area
Significance Rating:	Medium +	Medium +	-
Cumulative Impact:			-
Proposed Mitigation:	• Where reasonable and practical the contractors appointed by the applicant should appoint local contractors and implement a "local first" policy, especially for semi and low-skilled job categories. However; due to the low skill levels in the area, the majority of skilled posts are likely to be filled by personnel from outside the area; • The recruitment selection process should seek to promote gender equality and the employment of women wherever possible, particularly for less labour-intensive work such as flag bearing and supervision; and, • The ongoing presence of semi and high skilled personnel involved in the project construction phase will generate sustained clientele to a portion of the guest house industry within the vicinity of the development.		-
Nature of Impact: Prevent danger to trespassing of persons.	**Activity:** Keep the site secure from Local Communities and thieves in order to avoid any injuries and/or theft of equipment		No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance Rating:	Medium	Low	-

Planning, Design and Construction Phase	Alternative 1		No-Go Alternative
	Before Mitigation	After mitigation	
Cumulative Impact:	-	-	-
Proposed Mitigation:	• Be responsive to open or closed status of gates; • New or the upkeep of fences should align to ensure safety of animals and maintain a reliable boundary area; • All equipment must be stored properly in a site camp with a lockable gate to ensure no risk to local communities at night; and, • It is recommended that a security guard be appointed to see to equipment after hours.		-

Planning, Design and Construction Phase	Alternative 1		No-Go Alternative
	Before Mitigation	After mitigation	
POTENTIAL IMPACTS ON CULTURAL-HISTORICAL ASPECTS:			
Nature of Impact: Damage and destruction of vertebrate fossils during excavation activities.	**Activity:** Excavation activities can result in the discovery of cultural and historical artefacts beneath the earth surface. Damage or loss can occur if the correct procedures are not followed.		No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance Rating:	Low	Low	-
Cumulative Impact:	-	-	-

Proposed Mitigation:	• Should any heritage resources (including but not limited to fossil bones, coins, indigenous and/or colonial ceramics, any articles of value or antiquity, stone artefacts or bone remains, structures and other built features, rock art and rock engravings) be exposed during excavation for the purpose of construction, construction in the vicinity of the finding must be stopped. A trained palaeontologist or heritage specialist must be notified to assess the finds, and this must then be reported to the applicable heritage authority;
	• Heritage remains uncovered or disturbed during earthworks must not be disturbed further until the necessary approval has been obtained from the heritage authority. A registered heritage specialist must be called to the site for inspection and removal once authority to do so, has been given;
	• Excavations must be limited to the footprint area and be maintained in a narrow corridor;
	• All operations of excavation equipment must be made aware of the possibility of the occurrence of sub-surface heritage features and the following procedures must be followed:
	  ○ All construction in the immediate 50 m vicinity radius of the site must cease;
	  ○ The heritage practitioner must be informed as soon as possible;
	  ○ In the event of obvious human remains SAPS must be notified;
	  ○ Mitigation measures (such as refilling, etc.) must not be attempted;
	  ○ The area in a 50 m radius of the find must be cordoned off with hazard tape;
			-

Planning, Design and Construction Phase	Alternative 1		No-Go Alternative
	Before Mitigation	After mitigation	
	• Public access must be limited and the area must be placed under guard; • The Furnace area must be protected and declared a no-go area until the developer appoints a suitably qualified archaeologist to conduct a Phase 2 archaeological assessment of the terrain and to draw up a heritage management plan for the site; and, The appointed archaeologist must apply for a valid permit from SAHRA to excavate the furnace for display and educational purposes.		

Planning, Design and Construction Phase	Alternative 1		No-Go Alternative
	Before Mitigation	After mitigation	
POTENTIAL IMPACTS ON VISUAL ASPECTS:			
Nature of Impact: Impact on the sense of place for surrounding users.	**Activity:** The movement of construction vehicles, machinery and personnel on site shall result in a visual impact on surrounding users. Furthermore to this, the storage of materials and excavation shall result in disturbance and an unsightly character.		No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance Rating:	Medium	Low	-
Cumulative Impact:	Low	Low	-
Proposed Mitigation:	• Access roads are to be kept clean and dust suppression techniques should be implemented to minimise impacts of vehicle movement; • Site offices and structures should be limited to one location and carefully situated to reduce visual intrusions. Roofs should be grey and non-reflective; • Construction camps as well as development areas should be screened with netting; • Lights within the construction camp should face directly down (angle of 90˚); • Vegetation should remain intact and development must be situated behind the vegetation screen to minimise the visual impact; • Minimum vegetation should be removed to ensure the visual absorption capacity remain high; • Litter should be strictly controlled, as the spread thereof through wind could have a very negative visual impact; and, • Avoid shiny materials in structures. Where possible shiny metal structures should be darkened or screened to prevent glare.		-

Planning, Design and Construction Phase	Alternative 1		No-Go Alternative
	Before Mitigation	After mitigation	
POTENTIAL IMPACTS ON NOISE ASPECTS:			

Planning, Design and Construction Phase	Alternative 1		No-Go Alternative
	Before Mitigation	After mitigation	
Nature of Impact Noise will be generated during the construction **phase**	**Activity**: Noise levels along the road will increase during the construction activities due to the use of heavy machinery and vehicles.		No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance Rating:	Medium	Low	-
Cumulative Impact:			-
Proposed Mitigation:	• All machinery must be serviced at regular intervals in order to ensure that they do not emit unnecessary noise. • Vegetation along the road servitude must not be removed unnecessarily in order to maintain a vegetative barrier which will assist with preventing noise from travelling to residents and neighbouring farms. • During construction keep noise levels within acceptable limits in compliance with all relevant guidelines and regulations • All vehicles and machinery must be fitted with appropriate silencing technology that must be properly maintained. • The use of all plant and machinery must be appropriate to the task required in order to reduce noise levels. • Increased attention to maintenance of tools and equipment will reduce worksite noise levels. • Use light equipment or machinery such as the hand-held ("jackhammers") and machine breakers (" woodpeckers").		-

2. POTENTIAL IMPACTS DURING THE OPERATIONAL PHASE:

Operational Phase	Alternative 1		No-Go Alternative
	Before Mitigation	After mitigation	
POTENTIAL IMPACTS ON GEOGRAPHICAL AND PHYSICAL ASPECTS:			
Nature of Impact: Handling of general waste materials on the maintenance site	**Activity**: The presence of maintenance personnel on site will increase the likelihood of littering and dumping of solid waste.		No operational phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance Rating:	Medium	Low	-
Cumulative Impact:	-	-	-
Proposed Mitigation:	• An adequate number of scavenger proof litter bins are to be placed throughout the site; • Waste sorting and separation bins should be placed at all public facilities, to encourage visitors to dispose waste paper, glass and general waste separately; • Keep all work sites including storage areas, offices and workshops neat and tidy;		-

Operational Phase	Alternative 1		No-Go Alternative
	Before Mitigation	After mitigation	
	• All domestic waste is to be removed from site and disposed of at a registered solid waste landfill site; • Care should be taken to ensure that no waste fall of disposal vehicles on-route to the landfill. If needed, a tarpaulin can be utilised; • The burning or burying of solid waste on site is prohibited. Do not burn PVC pipes or other plastic materials, as this is regarded as hazardous waste; • Minimise waste by sorting wastes into recyclable and non-recyclable waste; and, • A bi-weekly litter patrol of the entire site shall be conducted by the designated ESA.		
Nature of Impact: Soil and ground water contamination	**Activity:** Oil spillages and other chemical from the vehicles can contaminate the soil and ground water due to run off.		No operational phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance Rating:	Medium High	Low	-
Cumulative Impact:	Low	None	-
Proposed Mitigation:	• Concrete can be mixed on mixing trays only and not on exposed soil. Concrete must be mixed only in areas which have been specially demarcated for this purpose (preferable where no natural vegetation occur); • Concrete mixing to be carried out away from sensitive areas and on impermeable surfaces; • Material Safety Data Sheets (MSDSs) should be available on site for all chemicals and hazardous substances to be used on-site, including information on their ecological impacts and how to minimise the impacts in case of leakage; • All spillage must be cleaned up immediately after they have occurred; • Spillage of petrochemical products must be avoided. In the case of accidental spillage, contaminated soil must be removed for bioremediation or disposed of at a facility for the substance concerned. Disturbed land must be rehabilitated and seeded with vegetation seed naturally occurring on site; • Do not locate any ablution facilities, sanitary convenience, septic tank or French drain within the 1:100 year flood line, or within a horizontal distance of 100m (whichever is greater) of a watercourse or drainage line; • Vehicles and machinery must be regularly serviced to avoid leakages; • No vehicles may be parked within 100m from a watercourse; • No uncontrolled discharges from the site or working area to depressions may be permitted. All discharge points will require approval from the Environmental Site Agent (ESA); • No water courses may be used to clean equipment, or for bathing. All cleaning operations should take place off site at a location where waste water can be disposed of correctly; • The discharge of any pollutants such as cement, concrete, lime, chemicals, etc. into the natural environment and the storm water system must strictly be prohibited; • Fuel and chemical storage should be done within a designated area only, which is properly bund and able to contain 110% of the capacity of fuel or chemicals stored within;		-

Operational Phase	Alternative 1		No-Go Alternative
	Before Mitigation	After mitigation	
	• Construction vehicles must be inspected every morning before work commence to ensure that no leakages do occur; • All personnel must receive induction on how to report spillages, contain them and treat them accordingly; • Spill kits must be available at each working station; • Drip trays must be placed beneath all construction equipment that is stationary on site or within the site camp; and, • Hazardous waste must be stored in bins with a lid in a demarcated waste area, and must be disposed of at a hazardous treatment facility with records on file.		

Operational Phase	Alternative 1		No-Go Alternative
	Before Mitigation	After mitigation	
POTENTIAL IMPACTS ON BIOLOGICAL ASPECTS:			
Nature of Impact: Infestation of the area with Alien and Invasive Species	**Activity:** Implementation of alien and invasive Programme to control invasive plant species.		No operational phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance Rating:	Medium (M)	Low (L)	-
Cumulative Impact:	Low (L)	Low (L)	-
Proposed Mitigation:	***Clearing and Guiding Principles*** • Alien control programs are long-term management projects and should include a clearing plan which includes follow up actions for rehabilitation of the cleared area; • The lighter infested areas should be cleared first to prevent seed build-up; • Pre-existing dense areas should be left for last, as they probably will not increase in density or pose a greater threat than they are currently; and, • All clearing actions should be monitored and documented to keep track of which are due for follow-up clearing. ***Clearing Methods*** • Different species require different control methods such as manual, chemical or biological methods or a combination of the two; • Care should be taken to ensure that the clearing methods used do not encourage further invasion. As such, regardless of the methods used, soil disturbance should be kept to a minimum. The vegetative stage of the plants should also be considered before clearing; • Fire is not a natural phenomenon in the area and should not be used in general for alien control or vegetation management at the site.		-

Operational Phase	Alternative 1		No-Go Alternative
	Before Mitigation	After mitigation	
	• The best-practice clearing method for each species identified should be used. The preferred clearing methods for most alien species can be obtained from the Department of Water and Agricultural Affairs (DWAF) Working for Water website: http://www.dwaf.gov.za/wfw/Control/. ***Use of Herbicides for Alien Control*** Although it is usually preferable to use manual clearing methods where possible, such methods may create additional mechanical disturbance which may stimulate alien invasion and may also be ineffective for many woody species which resprout. Where herbicides are to be used , the impact of the eradication program on the natural environment should be minimised be observing the following: • Area contamination must be minimised by careful, accurate application with a minimum amount of herbicide to achieve good control; • Care must be taken to prevent contamination of water bodies. This includes special care in storage, application, cleaning equipment and disposal of containers, product and spray mixtures; • Equipment should be washed where there is no danger of contaminating water sources and washings carefully disposed of in a suitable place; • To avoid damage to indigenous or other desirable vegetation, herbicides that would have the least effect on the indigenous vegetation should be used; • Droplet nozzles with a course spray pattern should be fitted to avoid drift of herbicides onto neighbouring vegetation; and, • The appropriate health and safety precautions should be followed regarding the storage, handling and disposal of herbicides.		

Operational Phase	Alternative 1		No-Go Alternative
	Before Mitigation	After mitigation	
POTENTIAL IMPACTS ON SOCIO-ECONOMIC ASPECTS:			
Nature of Impact: Carrying capacity of the road	**Activity:** The increase in carrying capacity of the road after the improvement will improve the current traffic problem and allow free flow of vehicles in future thereby contributing to efficient utilization of the road in general. This can be considered as the positive impact of the proposed improvement.		No construction would lead to the crossings being unsafe to road users and no connection between the Local communities and free flow of traffic.
Significance Rating:	High Positive	-	
Cumulative Impact:		-	-
Proposed Mitigation:	• No proposed mitigation		-

Operational Phase	Alternative 1		No-Go Alternative
	Before Mitigation	After mitigation	
Nature of Impact: The creation of job opportunities during the operational phase,	**Activity:** Continues maintenance of the freeway will contribute to employment opportunities for the Operational life span of the freeway.		No construction will result in no job creation within the Local Area
Significance Rating:	Medium High Positive	Medium High Positive	
Cumulative Impact:	-	-	
Proposed Mitigation:	• No proposed mitigation measures.		-

Operational Phase	Alternative 1		No-Go Alternative
	Before Mitigation	After mitigation	
POTENTIAL IMPACTS ON NOISE ASPECTS:			
Nature of Impact: Noise Pollution	**Activity:** The operating of vehicles and machinery on site results in the generation of noise disturbing users of the surrounding area**.**		No operational phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Significance Rating:	Medium	Low	-
Cumulative Impact:			-
Proposed Mitigation:	• All reasonable precautions must be taken to minimize noise generated on site. • Construction vehicles must be kept in good working order so as not to generate excessive noise. • Activities which will lead to excessive noise near residential areas, should be limited to take place during the day.		-

RECOMMENDATIONS OF THE EAP

- No vehicles may be parked within the road reserve, designated parking/camp site areas need to be identified;
- No Hazardous Materials or Ablution Facilities may be stored within 100 metres from a watercourse;
- An adequate number of waste bins need to be available at stop and go areas and waste pick-up need to be done once a day;
- All bitumen transfer need to be according to the correct procedures minimising the impact of spills;
- All Ablution Facilities must be in working condition and serviced regularly;
- Personnel are not allowed to create any fires in the road reserve;
- It is important that all mitigation measures within the EMP are strictly adhere to;
- Should any heritage resources, including evidence of graves and human burials, archaeological material and paleontological material be discovered during the execution of the activities above, all works must be stopped immediately and Heritage Western Cape must be notified without delay;
- Prior to construction a walkthrough investigation to identify, map and translocate all protected plant species must be conducted;
- Translocation of indigenous species should not be done without permits from relevant Competent Authorities; and,
- Monitoring of the continued spread of Alien and Invasive Plants should be conducted as part of SANRAL's Invasive Alien Species monitoring and eradication program.

PERSONS RESPONSIBLE FOR IMPLEMENTING THIS EMPR

The "Responsibility" columns in the impact and mitigation tables provided below indicate which team member(s) are responsible for implementation of the identified mitigation measures; these team members include the following:

- Construction contractor(s);
- Construction manager;
- Applicant / Developer; and the
- Designated Environmental Officer

The sections below list further supplementary measures, which must also be implemented by the relevant team members.

During the **construction phase**, the **construction contractor** will:

- Be responsible to have the EMP'r available on site at all times;
- Provide the applicant with a "Method Statement" which will indicate the procedures that will be applied in order to meet the requirements of any aspect of the EMP'r; and
- Ensure that all problems identified during environmental inspections, are addressed and rectified as soon as reasonably possible.

During the **construction phase**, the **contract project managers** will:

- Have the authority to stop work and issue fines;
- Receive reports from the ECO and report to the client;
- Enforce contractor obligations to the EMP-r; and,
- Support the ECO in his/her roles and responsibilities.

During the **construction phase**, the **environmental control officer** will:

- Meet with the contractor and project manager to hand over the site and go through the content of the EMP-r, including the "do's and don'ts" of the project, to ensure that the parties understand their responsibilities to the EMP-r;
- Be accountable for monitoring and auditing activities to ensure compliance with the EMP-r and the Environmental Authorisation;

- Work correctively with other role-players, but not be influenced in opinion and must report to the applicant only;
- May, in the event of there being a serious threat to or impact on the environment, correspond with the contract project manager to stop work;
- Complete an ECO checklist after each site inspection and distribute this to the project team within 5 days; and,
- Conduct a final environmental audit of the project on completion of construction and rehabilitation, for submission to the DEA&DP to review.

During the **operational Phase** the **applicant/developer**, will be responsible to prevent negative environmental impacts, and as such will be responsible to:

- Set aside a budget for maintenance;
- Maintain all facilities and infrastructure in good working order to effectively fulfil its intended purpose and to prevent negative environmental impacts;
- Not construct any additional buildings, infrastructure, etc. contrary to the Environmental Authorisation, without performing an environmental impact assessment where listed activities of the 2017 NEMA EIA Regulations are triggered; and,
- To immediately remedy any aspects that contribute to negative environmental impacts.

On-site Communication

The following sections describe the site communication measures that will need to be implemented.

Site Instruction Entries

The Site Instruction book must be used for the recording of general site instructions as they relate to the works on site. It must also be used for the issuing of **stop work orders** for the purposes of immediately halting any particular activities of the contractor in lieu of the environmental risk that they may pose.

Method Statements

Method statements from the Contractor will be required for specific sensitive actions on request by the authorities or the ECO.

A method statement forms the baseline information on which work in sensitive environments takes place and is a "live document" allowing for modifications to be negotiated between the Contractor and ECO / Engineer, as circumstances unfolds.

A method statement describes the scope of the intended work, step-by-step, in order for the ECO and Engineer to understand the Contractor's intentions. This will enable them to assist in devising any mitigation measures, which would minimise environmental impact during these tasks. For each instance wherein it is requested that the Contractor submit a method statement to the satisfaction of the ECO, the format must clearly indicate the following:

- **What** – a brief description of the work to be undertaken;
- **How –** a detailed description of the process of work, methods and materials;
- **Where –** a description/sketch map of the locality of work (if applicable); and
- **When –** the sequencing of actions with due commencement dates and completion date estimates.

All method statements will form part of the EMP'r documentation and are subject to all terms and conditions contained within the EMP'r main document.

The Contractor must submit the method statement to the ECO before any particular construction activity is due to start. Work may not commence until the method statement has been approved by the ECO.

Record Keeping

All records related to the implementation of this EMP'r (e.g. site instruction book, method statements) must be kept together in an office where it is safe and can be retrieved easily. These records must be kept for two years and must at any time be available for scrutiny by any relevant authorities.

Monitoring

Several monitoring actions are proposed which would be undertaken by various project role players. For detail on these actions, "Responsible Person/Party", and "Monitoring Frequency" associated with the identified mitigation measures, refers to the "Monitoring" column in the impact assessment below (Chapter 8).

Performance Assessment and Reporting on EMP'r Compliance

A suitably-qualified Environmental Control Officer (ECO) must be appointed by the Applicant / Developer to oversee the implementation of the construction phase mitigation measures described in this EMP'r, as well as the conditions of authorisation as described in the Environmental Authorisation.

The ECO may not be someone appointed by the contractor, engineer or other party involved with this project, other than the Applicant / Developer.

The following applies, amongst others, to the ECO's role:

- The ECO must undertake **monthly site visits** during the **construction phase**,
- The ECO must **report to** the Applicant / Developer only.
- The ECO must present an **environmental site induction** / **awareness training session** to all personnel before work on site commences, as are also described below; and
- After completion of the construction activities, an environmental audit must be undertaken by the ECO, before commencement of the operational phase, in order to determine compliance with the EMP'r and the Environmental Authorisation. The audit report must be submitted to the competent authority.

The ECO can recommend the stopping of works if in his/her opinion there is a serious threat to, or impact on the environment, caused directly from the construction operations. This authority is to be limited to emergency situations where consultation with the engineer or applicant is not immediately available. In all such work stoppage situations the ECO is to inform the engineer and applicant of the reasons for the stoppage as soon as possible.

Upon failure by the contractor or his employee(s) to show adequate consideration to the environmental aspects of this contract, the ECO may recommend to the engineer to have the contractor's representative or any employee(s) removed from the site or work suspended until the matter is remedied. No extension of time will be considered in the case of such suspensions and all costs will be borne by the contractor.

ECO Site Inspection Reports

The ECO site inspection reports (also called "ECO checklists") will report on the compliance of the construction phase mitigation measures contained in the EMP'r, as well as the conditions of approval described in the Environmental Authorisation. The report must be submitted to the applicant, within five (5) days of the ECO site inspection, and must be made available to the construction contractor. Copies of the inspection reports must be kept on site.

The contractor's meeting minutes must reflect environmental queries, agreed actions and dates of eventual compliance. These minutes form part of the official environmental record.

Photographs

It is recommended that photographs are taken of the site prior to, during and immediately after construction as a visual reference. These photographs must be stored with other records related to this EMP'r. If captured

in digital format, hard copies, in colour, must be kept with all other records relevant to the implementation of this EMP'r.

ENVIRONMENTAL AWARENESS PLAN

Environmental Awareness and Risk Training

All contractor team members involved in work on site are to be briefed on their obligations towards environmental controls and methodologies in terms of this EMP'r, prior to work commencing. The briefing will usually take the form of an on-site talk and demonstration by the ECO. The education / awareness programme must be aimed at all levels of management within the contractor team. See "basic rules of conduct" below.

Basic Rules of Conduct

The following list represents the basic *Do's* and *Don'ts* towards environmental awareness, which all participants in this project must consider whilst carrying out their tasks. These are not exhaustive and serve as a quick reference aid.

NOTE: ALL new site personnel must attend an environmental awareness/induction presentation. Please inform your foreman or manager if you have not attended such a presentation or contact the ECO.

DO:

- Clear your work areas of litter and building rubble at the end of each day – use the waste bins provided and prevent litter from being blown away by wind.
- Report all fuel or oil spills immediately and stop the spill from continuing.
- Dispose of cigarettes and matches carefully, so to prevent veld fires (arson and littering is an offence).
- Confine work and storage of equipment to within the immediate work area.
- Use all safety equipment and comply with all safety procedures.
- Ensure a working fire extinguisher is immediately at hand if any "HOT WORK" is undertaken e.g. welding, grinding, gas cutting etc.
- Prevent excessive dust and noise.

DO NOT:

- Do not litter - report dirty or full facilities, i.e. full dustbins and dirty or blocked toilets.

- Do not make any fires.
- Do not enter any fenced off or demarcated areas.
- Do not allow waste, litter, oils or foreign materials into any storm water channels or drains or watercourses.
- Do not litter or leave food lying around.

IMPACTS AND MITIGATION MEASURES

A number of potential environmental impacts that may arise during the project have been identified. These are outlined in the following table below, and guidelines and mitigation measures are provided.

The Contractor must familiarise himself with the requirements of the EMP'r, keeping in mind that other site-specific requirements as outlined in the Environmental Authorisation must also be complied with.

The tables below pertain to the construction and operational phases of the proposed hydroponics farm. **Decommissioning has not been included as it is not foreseen that the proposed development will be decommissioned, but rather that it will be upgraded and maintained.** However, in the event that the site is decommissioned, the construction phase impact and mitigation measures will be sufficient to mitigate impacts associated with this phase.

2.1 Construction Phase Environmental Management Programme

CONSTRUCTION PHASE: THE PROPOSED CONSTRUCTION OF POTABLE WATER PIPELINES NEAR NOENIEPUT, NORTHERN CAPE.		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
1. **ACTIVITY:** PERMITS AND AUTHORISATIONS				
1.1	**Aspects:** Legislative compliance. **Impact:** Non-compliance with South African environmental legislation. **Objective:** Ensure compliance with all triggered environmental legislation. **Target:** Commence site establishment with all permission and approvals received and on hand.	Developer	**Monitoring Action:** Obtain copies of all permits; Record Keeping **Responsible Person/Party:** SANRAL **Monitoring Frequency:** Once off	
	Mitigation/Management Measures: a. The Developer is to have the following permits on commencement: • Environmental Authorisation; • Environmental Management Program; and, • Building approval from the Municipality			
2. **ACTIVITY:** SITE LAYOUT PLANNING				
2.1	**Aspects:** Site Layout Plan. **Impact:** Negative impact on the environment of unmanaged and unplanned placement of Infrastructure. **Objective:** To ensure acceptable impact and management of environmental issues at the main site and storage site during construction by proper planning of layout of infrastructure placement.	Developer	**Monitoring Action:** Record Keeping **Responsible Person/Party:**	

CONSTRUCTION PHASE: THE PROPOSED CONSTRUCTION OF POTABLE WATER PIPELINES NEAR NOENIEPUT, NORTHERN CAPE.		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	Target: All areas not demarcated for construction must remain vegetated and the impact must be minimised. **Mitigation/Management Measures:** a. Draw up and submit for approval a Site Layout Master Plan. This plan must show the final positions and extent of all permanent and temporary site structures and infrastructure, b. The planning for layout must be done in consultation with the ECO. c. The contractor may not deface, paint, damage or mark any natural features situated in or around the site for survey or other purposes; d. No servicing of vehicles may be permitted on site, unless for emergency purposes; e. Stockpiles must not be situated such that they obstruct pathways; and, f. Place infrastructure as far as possible on sites that have already been transformed;		Contract Project Manager / Engineer **Monitoring Frequency:** Once off	
3. **ACTIVITY:** CONSTRUCTION PROGRAMME / SCHEDULE				
3.1	**Aspects:** Project Management. **Impact:** Order and timing of construction activities and associated impacts. **Objective:** To Provide a clear indication of the order by which key construction activities will transpire. **Target:** Anticipate timing of impacts to coordinate the availability of any specialists and/or authorities who may be required to conduct site inspections. **Mitigation/Management Measures:**	Contract Project Manager / Contractor	**Monitoring Action:** Meetings; Risk Register; ECO Audit Checklist; Photographs **Responsible Person/Party:** Contract	

CONSTRUCTION PHASE: THE PROPOSED CONSTRUCTION OF POTABLE WATER PIPELINES NEAR NOENIEPUT, NORTHERN CAPE.		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	a. Draw up and sign off a project schedule with all contributing parties and service providers to commit to a timeline during which time construction milestones will be completed; b. Communicate any deviation from this schedule with all parties, so as to provide parties with sufficient opportunity for alternative arrangements to be made; c. Establish a risk register to identify and monitor potential factors which may result in setbacks/ delays on tasks within the project schedule; d. Hold management meetings with representatives of the project manager, contractor, engineer and other contributing parties to monitor and anticipate changes; and, e. Should circumstances/ incidents arise which may pose a risk to the project schedule, the construction contractor, and engineer and ECO are to keep records of this and the latter communicate this in the ECO Bi-Weekly Audit Checklist.		Project Manager / Contractor / ECO **Monitoring Frequency:** Once off	
4. **ACTIVITY:** COMMUNICATION WITH LAND-OWNERS				
4.1	**Aspects:** Landowner Consent. **Impact:** Disturbance of existing land use. **Objective:** Maintain a conflict-free relationship with landowners / users. **Target:** No complaints received from landowners / users of affected property.	Contract Project Manager / Contractor	**Monitoring Action:** Meetings; Risk Register.	

CONSTRUCTION PHASE: THE PROPOSED CONSTRUCTION OF POTABLE WATER PIPELINES NEAR NOENIEPUT, NORTHERN CAPE.		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	Mitigation/Management Measures: a. Landowners are to be aware and in agreement of site access arrangements; b. The landowner has to be requested to liaise with the site supervisor of the construction contractor prior to entering the construction footprint area for safety purposes; c. All property gates are to be kept closed when not in use (or kept in the open/closed state in which it was found); and, d. Any complaint or liaison with regard to environmental aspects, compensation or disorder to economic activities, must not be addressed by the contractor. A public complaint register must be kept on site and the contract project manager must inform the Developer and/or ECO to take further action.		**Responsible Person/Party:** Contract Project Manager / Contractor / ECO **Monitoring Frequency:** Once off	
5. **ACTIVITY:** SITE ESTABLISHMENT				
5.1	**Aspects:** Demarcation of the site and vegetation removal. **Impact:** Direct impact on vegetation during construction and loss of species. **Objective:** Prevent unnecessary habitat destruction. **Target:** All areas not demarcated for construction must remain vegetated.	Construction contractor	**Monitoring Action:** ECO to take photographs of site before clearance; ECO Audit Checklist. **Responsible Person/Party:** ECO	
	Mitigation/Management Measures: a. No natural surfaces are to be marked other than using droppers, beacons or other artificial object; b. Ensure the upkeep of demarcation boundaries throughout the period of construction until rehabilitation has been completed; c. Construction areas must be fenced;			

CONSTRUCTION PHASE: THE PROPOSED CONSTRUCTION OF POTABLE WATER PIPELINES NEAR NOENIEPUT, NORTHERN CAPE.		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	d. Keep areas affected to a minimum, strictly prohibit any disturbance outside the demarcated foundation footprint area; e. Clear as little indigenous vegetation as possible, aim to maintain vegetation where it will not interfere with the construction or operation of the development, rehabilitate an acceptable vegetation layer according to rehabilitation recommendations of the relevant EMP'r, if possible; f. There must be a preconstruction environmental induction for all construction staff on site to ensure that basic environmental biodiversity principles are adhered to; g. Restoration measures will be required to reinstate functionality in the disturbed soil and vegetation; and, h. No vegetation may be gathered for the purpose of creating fire;		**Monitoring Frequency:** Monthly	
5.2	**Aspects:** Topsoil stripping and conservation. **Impact:** Destruction of topsoil. **Objective:** Conserve and protect topsoil from erosion and destruction. **Target:** Topsoil condition maintained.	Construction contractor	**Monitoring Action:** ECO Audit Checklist; Photographs; **Responsible Person/Party:** ECO **Monitoring Frequency:** Monthly	
	Mitigation/Management Measures: a. In the absence of a distinguishable topsoil layer, strip the uppermost 300 mm of soil; b. Stockpile topsoil separately from subsoil, in heaps no higher than 2m; c. Topsoil stockpiles are to be kept free of weeds; d. Limit unnecessarily prolonged exposure of stripped areas and stockpiles; e. Topsoil stockpiles to be placed on a levelled area and measures to be implemented to safeguard the piles from being washed away in the event of heavy rains/ storm water; f. Topsoil need to be stored in designated areas only. This need to be planned and indicated on the site-layout plan;			

CONSTRUCTION PHASE: THE PROPOSED CONSTRUCTION OF POTABLE WATER PIPELINES NEAR NOENIEPUT, NORTHERN CAPE.		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	g. Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction/ earthworks in that area; h. Strip and stockpile herbaceous vegetation, overlying grass and other fine organic matter along with the topsoil; i. Ensure that topsoil is not mixed with subsoil and/or any other excavated material; j. Temporarily stored topsoil must be re-applied within 6 months, topsoil stored for longer need to be managed according to a detailed topsoil management plan; k. Topsoil must be used in all rehabilitation activities, and may not be compacted to ensure that its plant support capacity remain of high quality; l. Do not strip topsoil when it is wet; and, m. Do not mix topsoil obtained from different sites, unless the ECO gives permission.			
6. **ACTIVITY:** SITE INFRASTRUCTURE PLACEMENT AND OPERATION				
6.1	**Aspects:** Structures and lay-down areas. **Impact:** Deterioration of site features and surrounding areas. **Objective:** Prevent the deterioration of site features like soil, rainwater runoff and erosion. **Target:** The preservation of site conditions evident on establishment of structures and lay-down areas. **Mitigation/Management Measures:** a. Locate all structures and storage areas, including offices, workshops and stores in approved locations are per the Site Layout Plan;	Construction contractor	**Monitoring Action:** Photographs; ECO Audit Checklist **Responsible Person/Party:** ECO **Monitoring Frequency:**	

CONSTRUCTION PHASE: THE PROPOSED CONSTRUCTION OF POTABLE WATER PIPELINES NEAR NOENIEPUT, NORTHERN CAPE.		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	b. The camp with storage and laydown areas are to be kept secure and neat with access control measures adopted during construction; c. Clearly define which activities are to occur within which areas of the site by erecting signage; and, d. All hazardous substances, such as fuel, oil, diesel, paint, etc., must be stored in a secondary containment system (trays or bund) which is capable of storing at least 110% of the liquid capacity. If bund areas are used, it must be sealed to avoid seepages.		Monthly	
7. **ACTIVITY:** CONSTRUCTION SITE OPERATIONS				
7.1	**Aspects:** Security and fencing. **Impact:** Prevent danger to trespassing of persons. **Objective:** Keep the site secure from trespassing or theft and keep animals out. **Target:** Site remains secure during construction with no incidences of trespassing, theft and injury or death to animals.		**Monitoring Action:** Photographs; ECO Audit Checklist **Responsible Person/Party:** ECO **Monitoring Frequency:** Monthly	
	Mitigation/Management Measures: a. Be responsive to open or closed status of gates; b. New or the upkeep of fences must be align to ensure safety of animals and maintain a reliable boundary area; c. Limit clearing of vegetation for fencing to the removal of trees and shrubs within 1 m of the fence line. All undergrowth must be maintained; d. Should construction activities require the removal of fences or gates to execute tasks, this must be replaced as soon as possible following completion; and,			

CONSTRUCTION PHASE: THE PROPOSED CONSTRUCTION OF POTABLE WATER PIPELINES NEAR NOENIEPUT, NORTHERN CAPE.		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	e. In all cases, the landowners on whose property any use of fences or gates, must be consulted, to ensure that parties are informed of construction activity, schedules and vehicle movement.			
7.2	**Aspects:** Existing Services and Infrastructure. **Impact:** Damage to existing services and infrastructure. **Objective:** No damages to existing services and infrastructure. **Target:** No damages to existing services and infrastructure.	Construction contractor	**Monitoring Action:** Photographs; ECO Audit Checklist **Responsible Person/Party:** Contractor **Monitoring Frequency:** Monthly	
	Mitigation/Management Measures: a. Take cognisance of the position of existing services and infrastructure (e.g. roads, pipelines, power lines and telephone services) that may get damaged due to construction activities; b. Ensure that existing services are not damaged or disrupted unless required by the contract and with the permission of the project manager; and c. In the event that infrastructure is damaged or services interrupted during construction, it will be done at the expense of the Contractor and shall receive top priority over all other activities.			

CONSTRUCTION PHASE: THE PROPOSED CONSTRUCTION OF POTABLE WATER PIPELINES NEAR NOENIEPUT, NORTHERN CAPE.		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
7.3	**Aspects:** Traffic. **Impact:** Impact on traffic. **Objective:** Minimise the disruption of road users. **Target:** Minimal disruption of road users. **Mitigation/Management Measures:** a. All vehicles must be road-worthy and drivers must be qualified, made aware of the potential road safety issues, and need for strict speed limits; b. Vehicles used for transport of materials and sand must be fitted with tarpaulins to prevent the release of such material or items onto road surfaces; c. Construction vehicles may not leave the designated roads and tracks and turnaround points must be limited to specific sites; d. Abnormal loads must not be transported after dark; e. Abnormal loads must be timed to avoid times of year when traffic volumes are likely to be higher, as would be expected over national holidays, weekends and school holiday periods; f. Transport of materials must be limited to the least amount of trips possible; and g. Traffic deviations around the construction area must be planned in conjunction with the local authority to ensure safe and free flow of traffic. Safety signs must be utilised.	Construction contractor	**Monitoring Action:** Incident Register; Photographs; ECO Audit Checklist **Responsible Person/Party:** Contractor **Monitoring Frequency:** Monthly	
7.4	**Aspects:** Traffic. **Impact:** Traffic impacts associated with the movement of construction vehicles on site.	Construction contractor	**Monitoring Action:** Incident Register;	

CONSTRUCTION PHASE: THE PROPOSED CONSTRUCTION OF POTABLE WATER PIPELINES NEAR NOENIEPUT, NORTHERN CAPE.		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	Objective: To minimise the destruction of biodiversity, compaction of valuable topsoil and mortalities of fauna on site. **Target:** Minimal destruction of biodiversity, compaction of valuable topsoil and mortalities of fauna on site.		Photographs; ECO Audit Checklist **Responsible Person/Party:** Contractor **Monitoring Frequency:** Monthly	
	Mitigation/Management Measures: a. During construction create designated turning areas and strictly prohibit any off-road driving or parking of vehicles and machinery outside designated areas; b. Ensure that runoff from compacted or sealed surfaces is slowed down and dispersed sufficiently to prevent accelerated erosion from being initiated (storm water and erosion management plan required). c. Monitor the establishment of (alien) invasive species and remove as soon as detected, before regenerative material can be formed; d. Abnormal loads and machinery must avoid movement over gravel roads during and immediately after rainfall events, so as to limit destruction of road surfaces and sedimentation of downhill rivers/streams; e. All vehicles must be road-worthy, be maintained to prevent fuel or oil leaks and drivers are to the licensed appropriately for the driving of their assigned vehicle. Drivers responsible for the transportation of personnel must be specifically licensed to do so; f. Construction vehicles may not leave the designated roads and tracks, whilst U-Turns are prohibited on all roads; g. Signage is to be placed on vehicles at all times; h. All construction vehicles must adhere to construction sites and avoid off road to minimise impact on vegetation and soil; i. After decommissioning, if access roads or portions thereof will not be of further use to the landowner, remove all foreign material and rip area to facilitate the establishment of vegetation, followed by a suitable revegetation program; and,			

CONSTRUCTION PHASE: THE PROPOSED CONSTRUCTION OF POTABLE WATER PIPELINES NEAR NOENIEPUT, NORTHERN CAPE.		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	j. Construction-related vehicles and machinery may not operate on site without reflective safety signage, car-top lights and reflective personnel gear.			
7.5	**Aspects:** Erosion Control. **Impact:** Loss of topsoil, formation of bare soil and deterioration of habitat quality. **Objective:** Prevent soil erosion. **Target:** No signs of soil erosion are evident on site. **Mitigation/Management Measures:** a. Disturb as little ground area as possible, stabilize that area as quickly as possible, control drainage through the area, and trap sediment on site; b. Conserve topsoil with its leaf litter and organic matter, and re-apply this material to local disturbed areas to promote the growth of local native vegetation; c. Apply erosion control measures before the rainy season begins and after each season of construction, preferably immediately following construction; and, d. Maintain and reapply erosion control measures until vegetation is successfully established.	Construction contractor	**Monitoring Action:** Incident Register; Photographs; ECO Audit Checklist **Responsible Person/Party:** Contractor **Monitoring Frequency:** Monthly	
7.6	**Aspects:** Handling of general – and hazardous waste materials on the construction site. **Impact:** The presence of personnel and construction operations will increase the likelihood of littering and dumping of solid waste. **Objective:** Management and disposal of general – and hazardous waste in an appropriate manner.	Construction Contractor	**Monitoring Action:** ECO Audit Checklist	

CONSTRUCTION PHASE: THE PROPOSED CONSTRUCTION OF POTABLE WATER PIPELINES NEAR NOENIEPUT, NORTHERN CAPE.	RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
Target: No record of pollution or site contamination by solid waste. **Mitigation/Management Measures:** a. An adequate number of scavenger proof litter bins are to be placed throughout the site. Two waste bins; at least; must be present, one (1) for hazardous waste and one (1) for general waste at each working station. Dumping of waste on site is prohibited; b. Waste sorting and separation must form part of the environmental induction and awareness programme, to encourage personnel to collect waste paper, glass and metal waste separately; c. Keep all work sites including storage areas, offices and workshops neat and tidy; d. Dedicate a demarcated and signposted storage area on site for the collection of construction waste; e. All domestic waste is to be removed from site and disposed of at a registered solid waste landfill site; as mentioned in the Basic Assessment Report; f. Care must be taken to ensure that no waste fall off disposal vehicles on-route to the landfill. If needed, a tarpaulin can be utilised; g. The burning or burying of solid waste on site is prohibited. Do not burn PVC pipes or other plastic materials, as this is regarded as hazardous waste; h. Littering by construction workers shall not be permitted; i. Workers from the immediate area need to be encouraged to take their waste with them at the end of each day; j. General refuse/rubbish shall be removed from site on a weekly basis to an approved registered landfill site or as soon as the waste bins are reaching full capacity;		**Responsible Person/Party:** ECO **Monitoring Frequency:** Monthly	

CONSTRUCTION PHASE: THE PROPOSED CONSTRUCTION OF POTABLE WATER PIPELINES NEAR NOENIEPUT, NORTHERN CAPE.		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	k. Minimise waste by sorting waste into recyclable and non-recyclable waste; l. Ablution facilities must be serviced by a registered service provider, cleaned at least once a week, and safe disposal slips must be on file at the site office; m. A bi-weekly (twice a week) litter patrol of the entire site shall be conducted by the designated Environmental Control Officer (ECO); n. Hazardous waste must be sorted general waste and disposed of at a hazardous treatment facility, records and proof of disposal must be kept; and, o. Do not dump waste of any nature, or any foreign material in a River or any drainage line.			
7.7	**Aspects:** Sewage waste. **Impact:** Pollution and site contamination due to sewage. **Objective:** Provide facilities for appropriate collection and disposal of sewage. **Target:** No record of pollution or site contamination by sewage.	Construction contractor	**Monitoring Action:** ECO to take photographs of site before clearance; ECO Audit Checklist **Responsible Person/Party:** ECO **Monitoring Frequency:** Monthly	
	Mitigation/Management Measures: a. Provide portable chemical ablution facilities, situated at convenient locations in proximity to work areas. This must be in relation to the quantity of users on site, with 1 ablution facility per 15 users and for each gender; b. Locations for the placement of ablution facilities include the workshop and areas for resting and eating. c. Ablution facilities are to be maintained and cleaned regularly to ensure functionality and an adequate level of hygiene; d. Drinking water facilities, comprising of a water tank with a manual tap can be combined with hand washing facilities near site ablution; and,			

CONSTRUCTION PHASE: THE PROPOSED CONSTRUCTION OF POTABLE WATER PIPELINES NEAR NOENIEPUT, NORTHERN CAPE.		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	e. Only toilet paper is to be flushed down the chemical ablution facility. Personnel are to be informed on sanitary implementation as part of the environmental awareness.			
7.8	**Aspects:** Dust Generation and visual Impact. **Impact:** Dust nuisance from site operations and visual impact of site operations on surrounding land owners. **Objective:** To avoid dust from excavated materials and construction activity and unnecessary visual impact caused by site operations. **Target:** Minimise the incidence of dust generation and visual impact.	Construction contractor	**Monitoring Action:** ECO to take photographs of site before clearance; ECO Audit Checklist **Responsible Person/Party:** ECO **Monitoring Frequency:** Monthly	
	Mitigation/Management Measures: a. Implement dust suppression measures by watering (or acceptable methods) areas to be cleared as well as already exposed surfaces with damaged soil particles, particularly during dry, windy periods; b. Ensure all vehicles remain on designated roads; c. Dust masks are to be supplied to workers; d. The transfer of soil or aggregate must be done over the shortest possible distance; e. Access roads are to be kept clean; f. Surface material that is scraped off during construction must be conserved and used for rehabilitation. Any spoil material must be disposed of in a manner that appears natural; g. Lay-down area(s) must be screened with shade cloth in an earth tone or other appropriate neutral colour; h. Site offices and structures must be limited to one location and carefully situated to reduce visual intrusion. Roofs must be grey and non-reflective;			

CONSTRUCTION PHASE: THE PROPOSED CONSTRUCTION OF POTABLE WATER PIPELINES NEAR NOENIEPUT, NORTHERN CAPE.		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	i. Lights within the construction camp must face directly downwards (angle of 90˚); j. Avoid shiny materials in structures. Where possible shiny metal structures must be darkened or screened to prevent glare; k. Litter must be strictly controlled, as the spread thereof through wind could have a very negative visual impact; and, l. The minimum amount of topsoil and vegetation must be removed during construction, must be conserved and used for final rehabilitation.			
7.9	**Aspects:** Noise Generation. **Impact:** Noise nuisance from site operations. **Objective:** To avoid excessive noise generation from site operations. **Target:** Minimise the incidence of noise generation.	Construction contractor	**Monitoring Action:** ECO to take photographs of site before clearance; ECO Audit Checklist **Responsible Person/Party:** ECO **Monitoring Frequency:** Monthly	
	Mitigation/Management Measures: a. Should multiple activities result in the excessive generation of noise, it must be strived to coordinate the incidence of these at the same time; b. Fit machinery with silencers; c. All stationary noisy equipment such as compressors and pumps must be contained behind acoustic covers, screens or sheds where possible; d. The regular inspection and maintenance of equipment must be undertaken to ensure that all components function optimally;			

CONSTRUCTION PHASE: THE PROPOSED CONSTRUCTION OF POTABLE WATER PIPELINES NEAR NOENIEPUT, NORTHERN CAPE.		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	e. Vehicles must avoid the use of their reverse gear as far as possible so as to avoid the sounding of sirens. This must not be considered for temporary access routes as disturbance of adjacent vegetation is to be avoided; f. Where recurrent use of machinery is frequent, machines must be shut down during intermediate periods; g. Unless otherwise specified by the ESA, normal working hours will apply (i.e. from 07H00–18H00, Mondays to Fridays); h. No loud music is permitted on site or in the Camp; i. Ensure that Employees and staff conduct themselves in an acceptable manner while on site, both during working hours and after hours; and, j. Vehicles are to abide by speed restrictions on access roads and limit trip generation so as to minimise disturbance to surrounding land users.			
7.10	**Aspects:** Fire Prevention. **Impact:** Uncontrollable fire. **Objective:** Prevent the outbreak of fires emanating from construction activity. **Target:** No incidences of fires are recorded for the site.			
	Mitigation/Management Measures: a. The potential risk of veld fires is heightened by windy conditions in the area, specifically during the dry, windy winter months; b. Assume acceptable precautions to guarantee that fires are not started as a result of works on site as specified below: the Contractor will be held responsible for any damage to structures or property on or neighbouring the Site as a result of any fire caused by personnel;	Construction contractor	**Monitoring Action:** ECO to take photographs of site before clearance; ECO Audit Checklist.	

CONSTRUCTION PHASE: THE PROPOSED CONSTRUCTION OF POTABLE WATER PIPELINES NEAR NOENIEPUT, NORTHERN CAPE.		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	c. The Contractor must ensure that construction related activities that pose a potential fire risk, such as welding etc. are properly managed and confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include clearing working areas and avoiding working in high wind conditions when the risk of fires is greater. In this regard special care must be taken during the high risk dry, windy winter months; d. The Contractor must provide fire-fighting training to selected construction staff and take cognisance of the Veld and Forest Fire Act, Act No. 101, 1998; e. As per the conditions of the Code of Conduct, in the event of a fire being caused by construction workers and or construction activities, the appointed contractors must compensate farmers for any damage caused to their farms. The contractor must compensate the fire-fighting costs borne by farmers and local authorities; f. Equip vehicles and site structures with fire extinguishers. Rubber beaters must be stored on site; g. No open fires are allowed anywhere on site; h. Storage of fuel or chemicals under trees is not permitted; i. Gas and liquid fuel is not to be stored in the same place; j. Smoking may only occur within a 3m radius from designated areas; k. Personnel must be adequately trained in the handling of firefighting equipment; and, l. Fuel, diesel, oil, or any other flammable substance must be stored 6m away from the smoking area.		**Responsible Person/Party:** ECO **Monitoring Frequency:** Monthly	
7.11	**Aspects:** Local communities. **Impact:** Impact of construction workers on local communities, construction personnel and the local community. **Objective:** Construction workers must not alter existing social dynamics of local communities.	Construction contractor	**Monitoring Action:** ECO Audit Checklist	

CONSTRUCTION PHASE: THE PROPOSED CONSTRUCTION OF POTABLE WATER PIPELINES NEAR NOENIEPUT, NORTHERN CAPE.	RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
Target: No incidences of conflict between. **Mitigation/Management Measures:** a. Where possible, the Employer must make it a requirement for contractors to implement a 'locals first' policy for construction jobs, specifically semi and low-skilled job categories. This will reduce the potential impact that this category of worker could have on local family and social networks; b. The Employer must consider the establishment of a Monitoring Forum (MF) for the construction phase. The MF must be established before the construction phase commences and must include key stakeholders, including representatives from the local community, local councillors, farmers, and the contractor. The role of the MF would be to monitor the construction phase and the implementation of the recommended mitigation measures. The MF must also be briefed on the potential risks to the local community associated with construction workers; c. The Employer and the contractors must, in consultation with representatives from the MF, develop a Code of Conduct for the construction phase. The code must identify what types of behaviour and activities by construction workers are not permitted. Construction workers that breach the code of good conduct must be dismissed. All dismissals must comply with the South African labour legislation; d. The Employer and the contractor must implement an HIV/AIDS awareness programme for all construction workers at the outset of the construction phase; e. The movement of construction workers on and off the site must be closely managed and monitored by the contractors. In this regard the contractors must be responsible for making the necessary arrangements for transporting workers to and from site on a daily basis;		**Responsible Person/Party:** ECO **Monitoring Frequency:** Monthly	

CONSTRUCTION PHASE: THE PROPOSED CONSTRUCTION OF POTABLE WATER PIPELINES NEAR NOENIEPUT, NORTHERN CAPE.		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	f. The contractor must make necessary arrangements to enable workers from outside the area to return home over weekends and or on a regular basis during the 12-18 month construction phase. This would reduce the risk posed by non-local construction workers to local family structures and social networks; g. The contractor must make the necessary arrangements for ensuring that all non-local construction workers are transported back to their place of residence once the construction phase is completed. This would reduce the risk posed by non-local construction workers to local family structures and social networks; and, h. No construction workers, will be permitted to stay overnight on the site. Security personnel will be housed in the vicinity of the site.			
7.12	**Aspects:** Soil and water contamination due to construction activities such as the use of hazardous materials on site. **Impact:** Pollution of soil and water contamination by hazardous waste. **Objective:** Provide facilities for appropriate collection and disposal of hazardous waste. **Target:** No record of pollution or site contamination by hazardous waste.	Construction contractor	**Monitoring Action:** Incident Register; Photographs; ECO Audit Checklist **Responsible Person/Party:** Contractor **Monitoring Frequency:** Monthly	
	Mitigation/Management Measures: a. Concrete can be mixed on mixing trays only and not on exposed soil. Concrete must be mixed only in areas which have been specially demarcated for this purpose (preferable where no natural vegetation occur); b. Concrete mixing to be carried out away from sensitive areas and on impermeable surfaces; c. Material Safety Data Sheets (MSDSs) must be available on site for all chemicals and hazardous substances to be used on-site, including information on their ecological impacts and how to minimise the impacts in case of leakage; d. All spillage must be cleaned up immediately after they have occurred;			

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e. Spillage of petrochemical products must be avoided. In the case of accidental spillage, contaminated soil must be removed for bioremediation or disposed of at a facility for the substance concerned. Disturbed land must be rehabilitated and seeded with vegetation seed naturally occurring on site; f. Vehicles and machinery must be regularly serviced to avoid leakages. If vehicles are to be serviced on the site then an allocated (impermeable) area is needed; g. No uncontrolled discharges from the site or working area to depressions may be permitted. All discharge points will require approval from the Environmental Site Agent (ESA); h. No water courses may be used to clean equipment, or for bathing. All cleaning operations must take place off site at a location where waste water can be disposed of correctly; i. The discharge of any pollutants such as cement, concrete, lime, chemicals, etc. into the natural environment and the storm water system must strictly be prohibited; j. Fuel and chemical storage must be done within a designated area only, which is properly bund and able to contain 110% of the capacity of fuel or chemicals stored within; k. Construction vehicles must be inspected every morning before work commence to ensure that no leakages do occur; l. All personnel must receive induction on how to report spillages, contain them and treat them accordingly; m. Spill kits must be available at each working station; n. Drip trays must be placed beneath all construction equipment that is stationary on site or within the site camp; and, o. Hazardous waste must be stored in bins with a lid in a demarcated waste area, and must be disposed of at a hazardous treatment facility with records on file.			

CONSTRUCTION PHASE: THE PROPOSED CONSTRUCTION OF POTABLE WATER PIPELINES NEAR NOENIEPUT, NORTHERN CAPE.		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
7.13	**Aspects:** Water Conservation. **Impact:** Wasting water as a result of negligence. **Objective:** Promote and implement water use efficiency mechanisms. **Target:** No Water Wastage. **Mitigation/Management Measures:** a. Re-use water were possible; b. Implement rain catchment strategies; c. Prevent leakages at taps and hoses by means of maintenance; d. Use buckets of water to clean tools instead of running water; e. Make sure that sediment, concrete, sand and rubbish does not end up going down the stormwater drain. Cover or filter stormwater inlets and drains; and, f. Require workers to use a broom rather than a hose to clean paths and gutters. If water use is necessary, use high pressure hoses which are both water efficient and more effective cleaners.	Construction contractor	**Monitoring Action:** Incident Register; Photographs; ECO Audit Checklist **Responsible Person/Party:** Contractor **Monitoring Frequency:** Monthly	
7.14	**Aspects:** Health and Safety. **Impact:** Dangerous working conditions for workers. **Objective:** To prevent any casualties on site. **Target:** No Personnel casualties on site. **Mitigation/Management Measures:**	Construction contractor	**Monitoring Action:** Incident Register; Photographs; ECO Audit Checklist	

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	a. Ensure that PPE is available to Personnel; b. Adhere to the Occupational Health and Safety Act; c. Keep the first aid kit stocked; d. Issue all workers with necessary health and safety items; e. Potentially hazardous areas must be demarcated with danger tape; f. Appropriate signage must be placed to caution Employees and contractors not to enter certain structures without authorisation; g. Regular safety inspections must be conducted to ensure that participants are equipped with necessary safety equipment; and, h. All construction personnel to wear hard hats and reflector jackets at all times.		**Responsible Person/Party:** Contractor **Monitoring Frequency:** Monthly	
7.15	**Aspects:** Heritage Resources. **Impact:** Damage and destruction of vertebrate fossils during excavation activities. **Objective:** To prevent any destruction of valuable artefacts. **Target:** No destruction of any vertebrate fossils and artefacts.	Construction contractor	**Monitoring Action:** Incident Register; Photographs; ECO Audit Checklist **Responsible Person/Party:** Contractor	
	Mitigation/Management Measures: a. Should any heritage resources (including but not limited to fossil bones, coins, indigenous and/or colonial ceramics, any articles of value or antiquity, stone artefacts or bone remains, structures and other built features, rock art and rock engravings) be exposed during excavation for the purpose of construction, construction in the vicinity of the			

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finding must be stopped. A trained palaeontologist or heritage specialist must be notified to assess the finds, and this must then be reported to the applicable heritage authority; b. Heritage remains uncovered or disturbed during earthworks must not be disturbed further until the necessary approval has been obtained from the heritage authority. A registered heritage specialist must be called to the site for inspection and removal once authority to do so, has been given; c. Excavations must be limited to the footprint area and be maintained in a narrow corridor; d. All operations of excavation equipment must be made aware of the possibility of the occurrence of sub-surface heritage features and the following procedures must be followed: a. All construction in the immediate 50 m vicinity radius of the site must cease; b. The heritage practitioner must be informed as soon as possible; c. In the event of obvious human remains SAPS must be notified; d. Mitigation measures (such as refilling, etc.) must not be attempted; e. The area in a 50 m radius of the find must be cordoned off with hazard tape; and, e. Public access must be limited and the area must be placed under guard.		**Monitoring Frequency:** Monthly	

2.2 Operational Phase Environmental Management Programme

The intention of providing an EMP'r for the operational phase is to provide guidelines for management of facilities and infrastructure to safeguard the environment against negative environmental impacts.

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1. **ACTIVITY:** OPERATIONAL PHASE IMPACTS				
1.1	**Aspects:** Noise Generation. **Impact:** Noise nuisance from site operations. **Objective:** To avoid excessive noise generation from site operations. **Target:** Minimise the incidence of noise generation. **Mitigation/Management Measures:** a. Machinery must be in sound mechanical condition and equipped with the necessary silencers; b. Workers on site must adhere to the prescribed working hours (7am – 6pm); c. Ensure that maintenance staff conduct themselves in an acceptable manner while on site, both during working hours and after hours; and, d. No loud music will be permitted on site.	Applicant	**Monitoring Action:** Applicant to adhere to business hours. **Responsible Person/Party:** Applicant	
1.2	**Aspects:** Handling of general – and hazardous waste materials on the construction site. **Impact:** The presence of personnel and construction operations will increase the likelihood of littering and dumping of solid waste. **Objective:** Management and disposal of general – and hazardous waste in an appropriate manner. **Target:** No record of pollution or site contamination by solid waste. **Mitigation/Management Measures:**	Construction Contractor	**Monitoring Action:** Maintenance Contractor Checklist **Responsible Person/Party:** ESA	

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a. An adequate number of scavenger proof litter bins are to be placed throughout the site. Two waste bins; at least; must be present, one (1) for hazardous waste and one (1) for general waste at each working station. Dumping of waste on site is prohibited; b. Waste sorting and separation must form part of the environmental induction and awareness programme, to encourage personnel to collect waste paper, glass and metal waste separately; c. Keep all work sites including storage areas, offices and workshops neat and tidy; d. Dedicate a demarcated and signposted storage area on site for the collection of construction waste; e. All domestic waste is to be removed from site and disposed of at a registered solid waste landfill site; as mentioned in the Basic Assessment Report; f. Caremust be taken to ensure that no waste fall off disposal vehicles on-route to the landfill. If needed, a tarpaulin can be utilised; g. The burning or burying of solid waste on site is prohibited. Do not burn PVC pipes or other plastic materials, as this is regarded as hazardous waste; h. Littering by construction workers shall not be permitted; i. Workers from the immediate area need to be encouraged to take their waste with them at the end of each day; j. General refuse/rubbish shall be removed from site on a weekly basis to an approved registered landfill site or as soon as the waste bins are reaching full capacity; k. Minimise waste by sorting waste into recyclable and non-recyclable waste;		**Monitoring Frequency:** Weekly	

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	l. Ablution facilities must be serviced by a registered service provider, cleaned at least once a week, and safe disposal slips must be on file at the site office; m. A bi-weekly (twice a week) litter patrol of the entire site shall be conducted by the designated Environmental Control Officer (ECO); n. Hazardous waste must be sorted general waste and disposed of at a hazardous treatment facility, records and proof of disposal must be kept; and, o. Do not dump waste of any nature, or any foreign material in the Bath River or any drainage line.			
1.3	**Aspects:** Soil and water contamination due to construction activities such as the use of hazardous materials on site. **Impact:** Pollution of soil and water contamination by hazardous waste. **Objective:** Provide facilities for appropriate collection and disposal of hazardous waste. **Target:** No record of pollution or site contamination by hazardous waste.	Construction contractor	**Monitoring Action:** Maintenance Contractor Checklist **Responsible Person/Party:** ESA **Monitoring Frequency:** Weekly	
	Mitigation/Management Measures: a. Concrete can be mixed on mixing trays only and not on exposed soil. Concrete must be mixed only in areas which have been specially demarcated for this purpose (preferable where no natural vegetation occur); b. Concrete mixing to be carried out away from sensitive areas and on impermeable surfaces; c. Material Safety Data Sheets (MSDSs) must be available on site for all chemicals and hazardous substances to be used on-site, including information on their ecological impacts and how to minimise the impacts in case of leakage; d. All spillage must be cleaned up immediately after they have occurred;			

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e. Spillage of petrochemical products must be avoided. In the case of accidental spillage, contaminated soil must be removed for bioremediation or disposed of at a facility for the substance concerned. Disturbed land must be rehabilitated and seeded with vegetation seed naturally occurring on site; f. Vehicles and machinery must be regularly serviced to avoid leakages; g. No uncontrolled discharges from the site or working area to depressions may be permitted. All discharge points will require approval from the Environmental Site Agent (ESA); h. No water courses may be used to clean equipment, or for bathing. All cleaning operations must take place off site at a location where waste water can be disposed of correctly; i. The discharge of any pollutants such as cement, concrete, lime, chemicals, etc. into the natural environment and the storm water system must strictly be prohibited; j. Fuel and chemical storage must be done within a designated area only, which is properly bund and able to contain 110% of the capacity of fuel or chemicals stored within; k. Construction vehicles must be inspected every morning before work commence to ensure that no leakages do occur; l. All personnel must receive induction on how to report spillages, contain them and treat them accordingly; m. Spill kits must be available at each working station; n. Drip trays must be placed beneath all construction equipment that is stationary on site or within the site camp; and, o. Hazardous waste must be stored in bins with a lid in a demarcated waste area, and must be disposed of at a hazardous treatment facility with records on file.			

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1.4	**Aspects:** Fire Prevention. **Impact:** Uncontrollable fire. **Objective:** Prevent the outbreak of fires emanating from construction activity. **Target:** No incidences of fires are recorded for the site.			
	Mitigation/Management Measures: a. The potential risk of veld fires is heightened by windy conditions in the area, specifically during the dry, windy winter months; b. Assume acceptable precautions to guarantee that fires are not started as a result of works on site as specified below: the Contractor will be held responsible for any damage to structures or property on or neighbouring the Site as a result of any fire caused by personnel; c. The Contractor must ensure that construction related activities that pose a potential fire risk, such as welding etc., are properly managed and confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include clearing working areas and avoiding working in high wind conditions when the risk of fires is greater. In this regard special care must be taken during the high risk dry, windy winter months; d. The Contractor must provide fire-fighting training to selected construction staff and take cognisance of the Veld and Forest Fire Act, Act No. 101, 1998; e. As per the conditions of the Code of Conduct, in the event of a fire being caused by construction workers and or construction activities, the appointed contractors must compensate farmers for any damage caused to their farms. The contractor must compensate the fire-fighting costs borne by farmers and local authorities;	Construction contractor	**Monitoring Action:** Maintenance Contractor Checklist **Responsible Person/Party:** ESA **Monitoring Frequency:** Weekly	

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	f. Equip vehicles and site structures with fire extinguishers. Rubber beaters must be stored on site; g. No open fires are allowed anywhere on site; h. Storage of fuel or chemicals under trees is not permitted; i. Gas and liquid fuel is not to be stored in the same place; j. Smoking may only occur within a 3m radius from designated areas; k. Personnel must be adequately trained in the handling of firefighting equipment; and, l. Fuel, diesel, oil, or any other flammable substance must be stored 6m away from the smoking area.			
1.5	**Aspects:** Biological Aspects. **Impact:** Infestation of the area with Alien and Invasive Species. **Objective:** Monitor the occurrence of Alien and Invasive Species within the development area. **Target:** No Alien and Invasive Species within the development footprint.			
	Clearing and Guiding Principles ***a.*** Alien control programs are long-term management projects and must include a clearing plan which includes follow up actions for rehabilitation of the cleared area; b. The lighter infested areas must be cleared first to prevent seed build-up; c. Pre-existing dense areas must be left for last, as they probably will not increase in density or pose a greater threat than they are currently; and, d. All clearing actions must be monitored and documented to keep track of which are due for follow-up clearing. ***Clearing Methods***		**Monitoring Action:** Maintenance Contractor Checklist **Responsible Person/Party:** ESA	

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e. Different species require different control methods such as manual, chemical or biological methods or a combination of the two; f. Care must be taken to ensure that the clearing methods used do not encourage further invasion. As such, regardless of the methods used, soil disturbance must be kept to a minimum. The vegetative stage of the plants must be considered before clearing; g. Fire is not a natural phenomenon in the area and must not be used in general for alien control or vegetation management at the site.; and, h. The best-practice clearing method for each species identified must be used. The preferred clearing methods for most alien species can be obtained from the Department of Water and Agricultural Affairs (DWAF) Working for Water website: http://www.dwaf.gov.za/wfw/Control/. ***Use of Herbicides for Alien Control*** Although it is usually preferable to use manual clearing methods where possible, such methods may create additional mechanical disturbance which may stimulate alien invasion and may also be ineffective for many woody species which resprout. Where herbicides are to be used , the impact of the eradication program on the natural environment must be minimised be observing the following: i. Area contamination must be minimised by careful, accurate application with a minimum amount of herbicide to achieve good control; j. Care must be taken to prevent contamination of water bodies. This includes special care in storage, application, cleaning equipment and disposal of containers, product and spray mixtures; k. Equipment must be washed where there is no danger of contaminating water sources and washings carefully disposed of in a suitable place; l. To avoid damage to indigenous or other desirable vegetation, herbicides that would have the least effect on the indigenous vegetation must be used; m. Droplet nozzles with a course spray pattern must be fitted to avoid drift of herbicides onto neighbouring vegetation; and, n. The appropriate health and safety precautions must be followed regarding the storage, handling and disposal of herbicides.		**Monitoring Frequency:** Weekly	

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1.6	**Aspects:** Socio-Economic Aspects within the area. **Impact:** The creation of job opportunities during the operational phase. **Objective:** The operational phase will create a few job opportunities for individuals residing in the area of Molote City due to maintenance work. **Target:** Job creation for individuals from Molote City.			
	a. Where reasonable and practical the contractors appointed by the applicant must appoint local contractors and implement a "local first" policy, especially for semi and low-skilled job categories. However; due to the low skill levels in the area, the majority of skilled posts are likely to be filled by personnel from outside the area; b. The recruitment selection process must seek to promote gender equality and the employment of women wherever possible, particularly for less labour-intensive work such as flag bearing and supervision; and, c. The ongoing presence of semi and high skilled personnel involved in the project construction phase will generate sustained clientele to a portion of the guest house industry within the vicinity of the development.		**Monitoring Action:** Maintenance Contractor Checklist **Responsible Person/Party:** ESA **Monitoring Frequency:** Weekly	
1.7	**Aspects:** Socio-Economic Aspects within the area. **Impact:** Presence of maintenance workers in the area. **Objective:** Reduce the negative risk of family structures and social networks by maintenance personnel. **Target:** No negative risk by maintenance personnel to family structures and social networks.			

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	a. Where possible, implement a requirement for contractors to implement a local employment policy for maintenance jobs, particularly for semi and low-skilled job categories, thus reducing impact which foreign workers could have on local communities; b. A contractual requirement of potential contractors must be a preparation and implementation of a Code of Conduct for maintenance workers, identifying types of behaviour and activities which maintenance workers may not engage in. Workers who breach this code must be dismissed, on the grounds that such dismissals comply with South African labour legislation; c. The project manager responsible for contractor appointments and administration, must implement an HIV/AIDS awareness programme for all contractors and their maintenance workers prior to commencement of maintenance activities; d. Contractors must manage the transport and movement of workers on and off site on a daily basis, as well as allow for the returning home of workers intermittently over weekends to limit interaction with local communities during such periods; and, e. No personnel, with the exception of security officers, are permitted to stay overnight in the vicinity of the maintenance site and must be housed in a site camp.		**Monitoring Action:** Maintenance Contractor Checklist **Responsible Person/Party:** ESA **Monitoring Frequency:** Weekly	

2.3 Impacts during the Decommissioning Phase

The activity will not be decommissioned in the future and therefore the proposed impacts thereof were not assessed.

3 EMERGENCY RESPONSE PLAN

The following table is provided to assist the ECO and construction contractor with remedial work options and problem solving:

Observation or Event	Action by Inspector or Observer	Action by Construction Contractor
Spillage of diesel or hydrocarbons on soil	Report to construction contractor and continue observations. Also check: ➢ That the source causing the spillage has ceased, and that the affected area is isolated to prevent spreading of the hazardous substance, where after it must be rehabilitated.	Action will be required as soon as possible (ASAP) by following the next steps: ➢ Dig down into the soil to see how far down the pollution penetrated, ➢ If less than 300mm penetrated: a. Turn the soil over to expose it to the air. b. Apply Mono Ammonium Phosphate (MAP) at a rate of 58gr/m² to the overturned soil. c. Water enough to keep the soil moist. ➢ If penetration is greater than 300mm: a. Remove the affected soil and spread in a layer not more than 300mm thick. b. Apply MAP at a rate of 50gr/m². c. Water enough to keep the soil moist. ➢ Repeat the above steps every 6 weeks or until the soil is clean.
Erosion	Report to construction contractor and continue observations. Also check: ➢ That all vehicular movement is restricted to existing access routes to prevent crisscrossing of tracks through	Action will be required ASAP: ➢ Implement erosion protection works at identified problem areas. ➢ Implement remedial works at affected areas in order to restore the area to its previous or better status.

Observation or Event	Action by Inspector or Observer	Action by Construction Contractor
	undisturbed areas.	

4 INCIDENT REGISTER

INCIDENT REGISTER: ROUTINE MAINTENANCE OF NATIONAL ROUTE 2 SECTION 4, WESTERN CAPE PROVINCE					
NAME OF PERSON REPORTING THE INCIDENT	INCIDENT	DATE OF INCIDENT IDENTIFIED	HOW WAS INCIDENT ADDRESSED?	DATE OF RECTIFICATION	SIGNATURE

5 REHABILITATION MEASURES AND CLOSURE PLAN

The rehabilitation phase follows completion of construction works and entails site clean-up and site rehabilitation following the removal of the Contractor from site. The underlying aim of rehabilitation is the process of returning land within the site boundary to some degree of its former natural state.

Key aspects within this process include the:

- Removal of structures and infrastructure;
- Handling of inert waste and rubble;
- Handling of hazardous waste and pollution control;
- Final shaping of the terrain;
- Topsoil replacement and soil amelioration;
- Ripping and scarifying of surfaces;
- Planting of indigenous occurring vegetation (if deemed necessary); and
- Maintenance.

5.1 Rehabilitation Measures

Removal of structures and infrastructure
• On completion of a section of works, the area must be rehabilitated by suitable landscaping, levelling, topsoil dressing, land preparation, alien plant eradication and where ascribed for by the ECO, vegetation establishment; • Clear and completely remove from site all construction structures and temporary infrastructure; • All permanent infrastructure must be returned to a useable state.
Inert waste and rubble
• Remove all inert waste and rubble, such as excess rock, any structural foundations and remaining aggregates. Only once this material has been removed, the site shall be re-instated and rehabilitated. • Domestic waste must be completely removed from the site and disposed of at a landfill site.
Topsoil replacement and soil amelioration
• The reinstatement of disturbed areas must follow immediately after the removal of structures and temporary infrastructure; • Topsoil backfilling must be undertaken when the soil is dry, and not following any recent rainfall events; • The replacement of topsoil must be sought in situ with construction where possible, or as soon as construction in an area has be completed; • All stockpiled topsoil together with herbaceous vegetation must be replaced and redistributed over a disturbed area such as temporary access roads; • Topsoil must be returned to the same site from where it was stripped;

• When insufficient topsoil remains, soil of a similar quality can be obtained from a nearby area within the construction area which was disturbed; • Once topsoil has been returned to the ground, stripped vegetation must be randomly spread by hand over the area.
Maintenance
• All re-growth of invasive vegetative material will be monitored by the Developer for one year; • All areas under rehabilitation are to be treated as no-go areas using danger tape and steel droppers/fencing and cordoned off, to prevent vehicular, pedestrian and livestock access. • Any re-vegetation must be done using plant species in occurrence on site; • Control invasive plant species and weeds using approved methods of manual or chemical intervention; • The re-establishment of vegetation must be allowed several rainy seasons, given the arid nature of the climate and region.