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Water and Sanitation
REPUBLIC OF SOUTH AFRICA



**BASIC ASSESSMENT REPORT AND
ENVIRONMENTAL MANAGEMENT
PROGRAMME REPORT FOR THE
PROPOSED BORROW PIT D ASSOCIATED
WITH THE MOKOLO AND CROCODILE
RIVER (WEST) WATER AUGMENTATION
PROJECT (PHASE 2A) (MCWAP-2A)**



mineral resources

Department:
Mineral Resources
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**BASIC ASSESSMENT REPORT
AND
ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT FOR
THE PROPOSED BORROW PIT D ASSOCIATED WITH THE
MOKOLO AND CROCODILE RIVER
(WEST) WATER AUGMENTATION PROJECT
(PHASE 2A) (MCWAP-2A)**

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).

Name of Applicant: Department of Water and Sanitation

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1. IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a prospecting or mining right if among others the mining “will not result in unacceptable pollution, ecological degradation or damage to the environment”.

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1) (c) the competent Authority must check whether the application has taken into account any minimum requirements applicable or instructions or guidance provided by the competent authority to the submission of applications.

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or a permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

It is furthermore an instruction that the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out below, and ensure that the report is not cluttered with uninterpreted information and that it unambiguously represents the interpretation of the applicant.

2. OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

The objective of the basic assessment process is to, through a consultative process—

- (a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- (b) identify the alternatives considered, including the activity, location, and technology alternatives;
- (c) describe the need and desirability of the proposed alternatives,
- (d) through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on the these aspects to determine:
 - (i) The nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
 - (ii) the degree to which these impacts—
 - (aa) can be reversed;
 - (bb) may cause irreplaceable loss of resources; and
 - (cc) can be managed, avoided or mitigated;
- (e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—
 - (i) identify and motivate a preferred site, activity and technology alternative;
 - (ii) identify suitable measures to manage, avoid or mitigate identified impacts; and
 - (iii) identify residual risks that need to be managed and monitored.

PART A: SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

Gibb Environmental, Bigen Group and Nyeleti Consulting Joint Venture (GBN-JV) was appointed by the Trans-Caledon Tunnel Authority (TCTA), the Implementing Agent on behalf of the Department of Water and Sanitation (DWS), to undertake the Environmental Impact Assessment (EIA) Processes for seven (7) new borrow pits associated with the Mokolo Crocodile River (West) Water Augmentation Project Phase 2A (MCWAP-2A) in terms of Government Notice (GN) No. R. 982 of 04 December 2014 (as amended). This Document serves as the Draft Basic Assessment Report (BAR) for the proposed Borrow Pit D, required for bedding material to be used for construction of the MCWAP-2A.

1. Contact Person and Correspondence Address

a) Details of:

i) The Environmental Assessment Practitioner (EAP) who prepared this BAR:

Name of The Practitioner:	Patricia Nathaniel
Tel No.:	012 471 8924
Fax No. :	012 348 5878
e-mail address:	pnathaniel@gibb.co.za

ii) Expertise of the EAP:

(1) The Qualifications of the EAP

- BSc (Hons) (Environmental Management) from the University of South Africa
- Registered Environmental Assessment Practitioner (EAP) (2020/1120)
- Refer to Appendix B for the CVs of the Project Team

(2) Summary of the EAP's Past Experience

- Nine (9) years' experience in Environmental Consulting
- Refer to Appendix B for CVs of the Project Team

b) Location of the overall Activity

Table 1: Property Details of Borrow Pit D

Farm Name:	Paarl 124 KQ Portion 7
Application area (Ha)	7.54 Ha
Magisterial district:	Thabazimbi
21 digit Surveyor General Code for each farm portion	T0KQ00000000012400007

c) Locality Map (Appendix A and Figure 1)

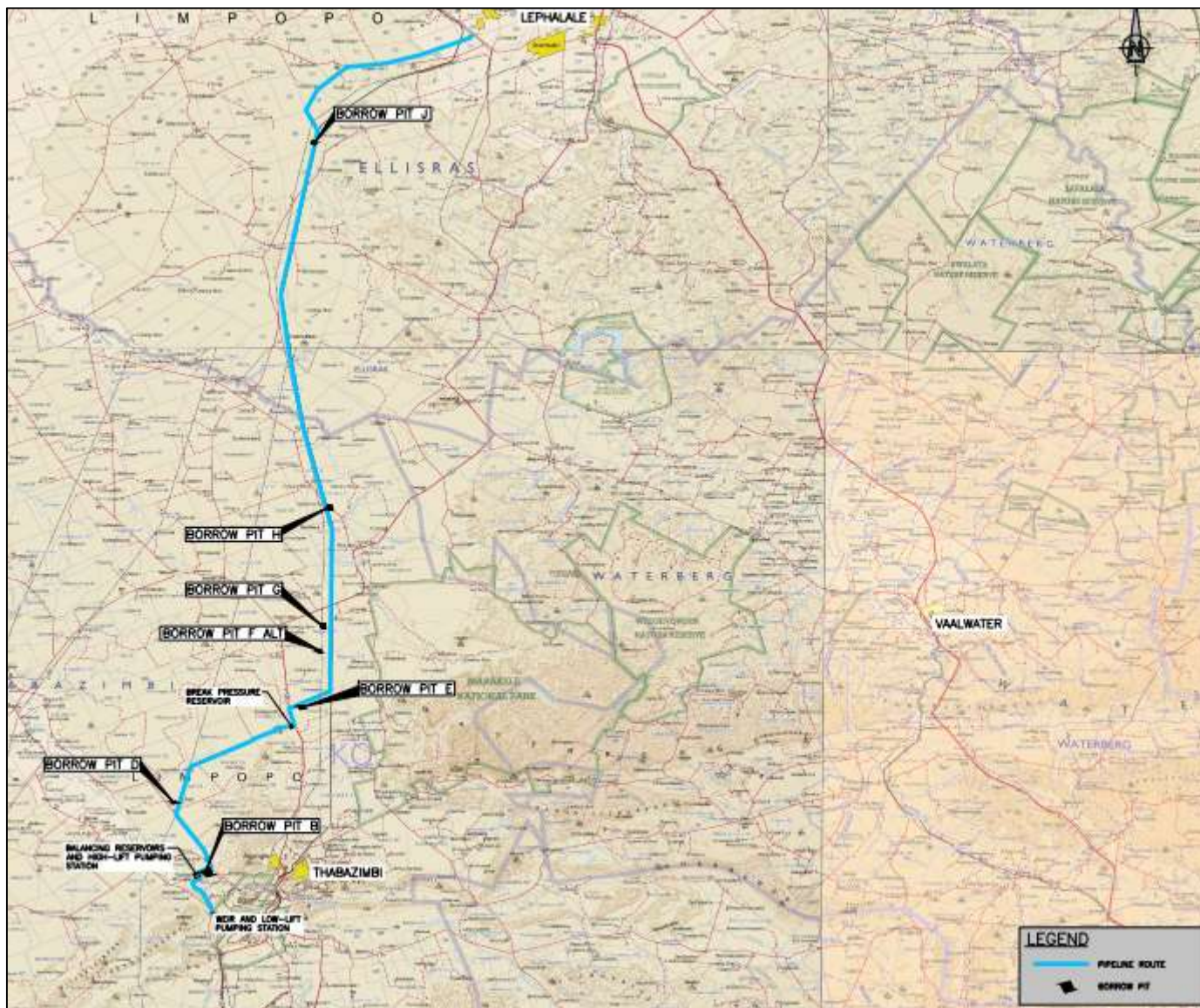


Figure 1: MCWAP-2 Project Area including the 7 new borrow pits

d) Description of the Scope of the Proposed Overall Activity

A plan drawn to a scale acceptable to the competent authority but not less than 1: 10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site in **Appendix C**.

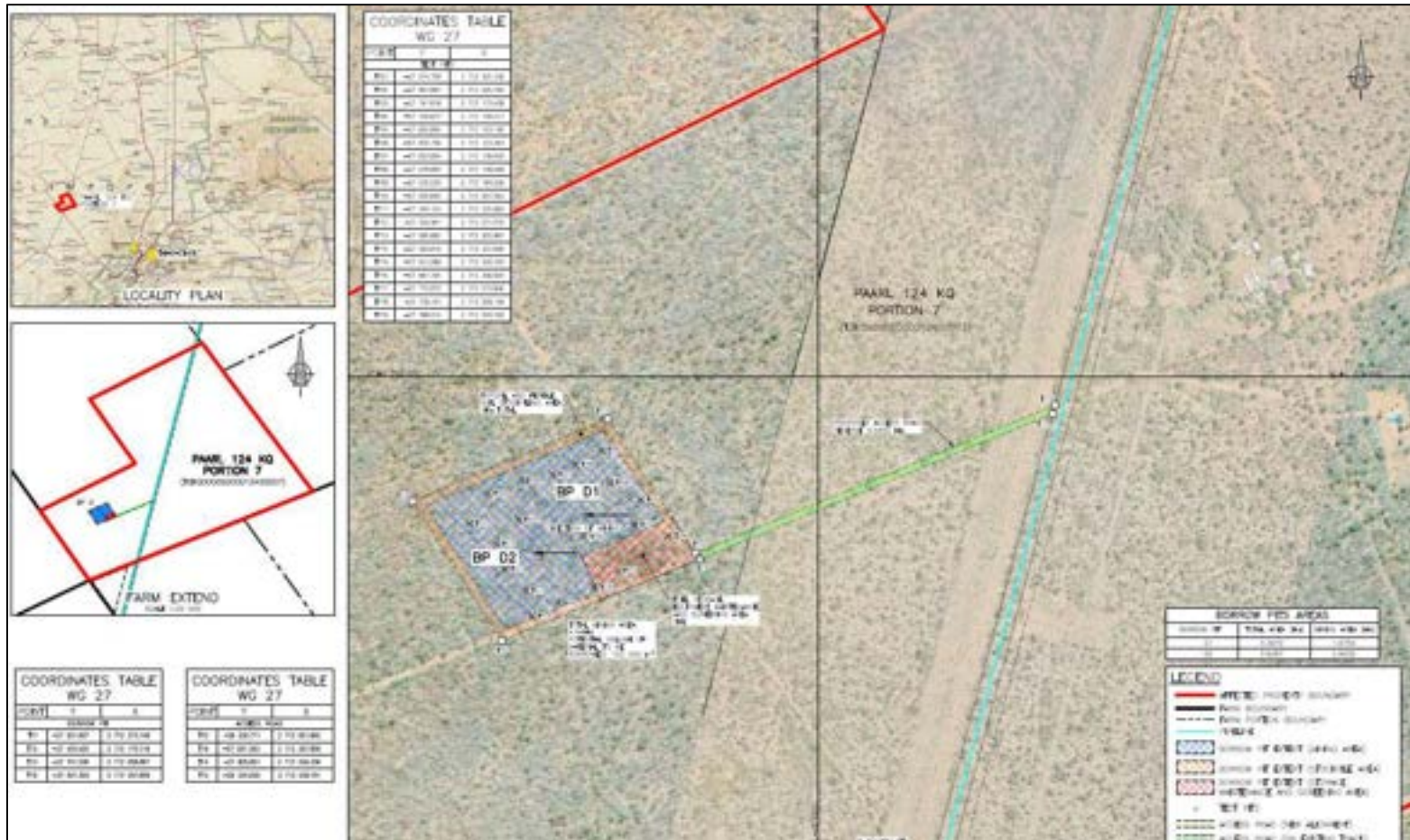


Figure 2: Site plan for Borrow Pit D

i) Listed and Specified Activities

Table 2: Listed and Specified Activities for Borrow Pit D

Name of activity	Aerial extent of the Activity Ha or m ²	Listed Activity	Applicable listing notice
<p>Storage of fuels required for construction and operation of the borrow pit</p> <p>The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres</p>	1Ha	X	Activity 14 of Listing Notice 1
<p>All activities associated with the borrow pit i.e. excavation, blasting, all associated structures and infrastructure</p> <p>Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including —</p> <p>(a) Associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource; or [including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)]</p> <p>(b) The primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing.</p>	7.54Ha with the mining area being 4.94Ha	X	Activity 21 of Listing Notice 1

Name of activity	Aerial extent of the Activity Ha or m ²	Listed Activity	Applicable listing notice
<p>New road required to access the borrow pit. The road is 10m wide 275m long</p> <p>The development of a road— (ii) with a reserve wider than 13,5 metres, or where no reserve exists where the road is wider than 8 metres.</p>	0.54Ha	X	Activity 24 of Listing Notice 1
<p>Clearance of approximately 7.47 Ha of indigenous vegetation on site in preparation for excavation and borrow pit related structures and infrastructure.</p> <p>The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation.</p>	7.47Ha of Dwaalboom Thornveld	X	Activity 27 of Listing Notice 1
<p>Three species from the list of protected trees under the NFA were recorded within this habitat unit, namely <i>Combretum imberbe</i> (Borrow Pit D), <i>Sclerocarya birrea</i> subsp. <i>caffra</i> (Borrow Pit B and D) and <i>Vachellia erioloba</i> (Borrow Pit D)</p> <p>Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).</p>	N/A	X	Activity 30 of Listing Notice 1
<p>The closure of the borrow pit and decommissioning of the site infrastructure.</p> <p>The decommissioning of existing facilities, structures or infrastructure for— (i) any development and related operation activity or activities listed in</p>	7.54Ha	X	Activity 31 of Listing Notice 1

Name of activity	Aerial extent of the Activity Ha or m ²	Listed Activity	Applicable listing notice
this Notice, Listing Notice 2 of 2014 or Listing Notice 3 of 2014			
<p>Borrow Pit D is within 2km of the Helena National Reserve, 5km of the Paarl National Reserve and 10km of the Van Wyk's, Fairfield and Fairlawns National Reserve</p> <p>The development of a road wider than 4 metres with a reserve less than 13,5 metres.</p> <p>e. Limpopo</p> <p>i. Outside urban areas:</p> <p>(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p> <p>(ff) Core areas in biosphere reserves;</p> <p>or</p> <p>(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, excluding disturbed areas.</p>	0.54 Ha	X	Activity 4 of Listing Notice 3
<p>The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.</p> <p>e. Limpopo</p> <p>i. All areas</p>	1 Ha	X	Activity 10 of Listing Notice 3

ii) Description of the Activities to be Undertaken

Scope of the Mokolo Crocodile River (West) Water Augmentation Project Phase 2A:

The overall MCWAP-2A consists of the following components:

- Water Transfer Infrastructure, which entail an Abstraction Weir at Vlieëpoort on the Crocodile River (West); Desilting Works, Raw Water Pipeline, Balancing Reservoirs and Pump Stations in order to abstract and transfer of water from Crocodile River (West) to Lephalale for which Environmental Authorisation (EA) with reference number 14/12/16/3/3/2/1100 was issued by the Chief Director: Integrated Environmental Authorisations of the Department of Forestry Fisheries and the Environment (DFFE);
- Borrow Pits for the supply of bedding material, 23 of which have already been subjected to an EIA Process and awaiting EA and Borrow Pit D being one (1) of seven (7) additional borrow pits required, and
- A River Management System to manage abstractions from, and the river flow in, the Crocodile River (West) between Hartbeespoort Dam and Vlieëpoort Weir, the Moretele River from Klipvoor Dam up to the confluence with the Crocodile River (West), the reach of the Elands River from Vaalkop Dam up to the confluence with the Crocodile River (West), and also the required flow over (past) the Vlieëpoort Weir.

Figure 3 below illustrates the entire MCWAP-2 project including the proposed borrow pits. Borrow Pit D is 1 of 7 borrow pits required for bedding material for the MCWAP-2 project as indicated in Table 4.

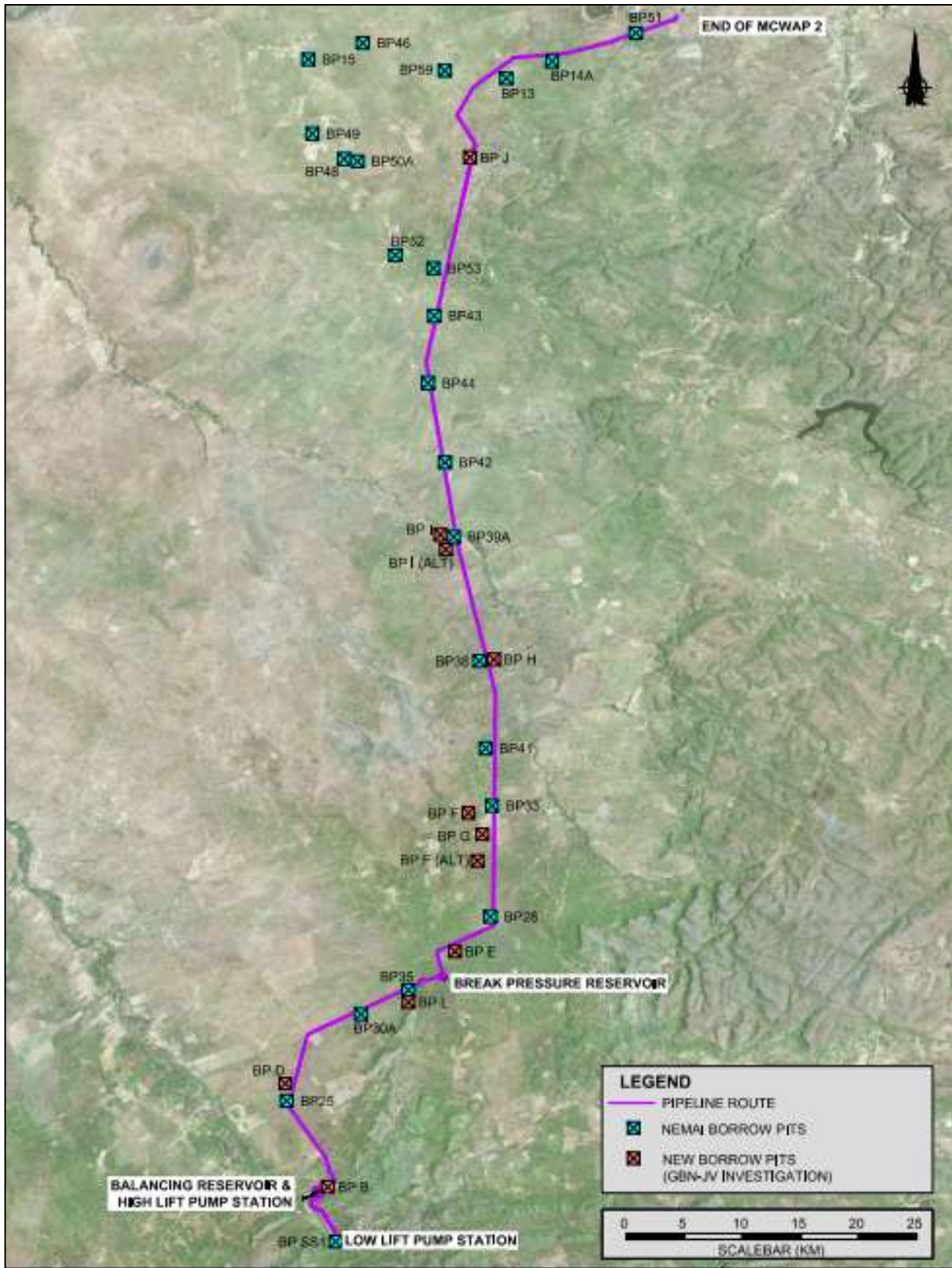


Figure 3: MCWAP-2 Project including 23 old and 7 new borrow pits

Activities associated with Borrow Pit D

The following activities are specific to the borrow pits:

- Construction/Pre-mining
 - Detailed geotechnical investigations (MCWAP-2 Geotechnical Investigation Factual Report- 2A-R-111E-15, July 2020 in Appendix D);
 - Consultation with affected landowners (Section H2 of this report);
 - Contractor to confirm the mining process and to develop a mining method statement;
 - Contractor to develop Mining Plan, which includes the layout of mining activities and features such as fencing, access arrangements, aggregate stockpiles, topsoil stockpiles, container stores, crushing and screening area, office and support facilities, haul roads, overburden placement, etc. (Refer to Appendix D for a preliminary site layout plan);
 - Understand site drainage and manage stormwater (e.g. construct sediment holding basins and divert up-slope water around the mining area);
 - Site preparation, including clearing and grubbing;
 - Stripping of topsoil;
 - Fencing of the mining area;
 - Construction of temporary fuel storage areas, equipment maintenance and temporary facilities.

- Mining - sourcing construction material for borrow areas. The primary activities related to the mining of suitable construction material include the following:
 - Excavation of the required material (sandy soil material layer (to approximately 1,9m depth, SC and SM unified classification material- coarse grained soils with fines) for pipe bedding and pedogenic material layer (to approximately 2,3m depth) for road construction);
 - Blasting where necessary (notification of affected landowners prior to blasting);
 - Control depth and extent of the borrow pit mining area, including side slopes and floor of mined area;
 - Remove and safe storage (temporary stockpiles) of topsoil and remaining overburden material for post-mining rehabilitation;
 - Process the borrowed material (crushing and screening) for use in earthworks;

- Load the borrow material into tipper trucks and haul material to pipeline trench, as well as other areas where the material is required;
 - Inert and spoil material to be used to fill and rehabilitate Borrow Pit D;
 - Stormwater management will be required where there is ponding of water especially during summer rainfall events.
- Post-mining -
 - Grading of site;
 - Removal of all structures and infrastructure associated with mining activities;
 - Stabilise, reinstate and rehabilitate borrow areas;
 - Closure of the borrow pit will require a Closure Plan.
- The mining equipment to be used includes the following:
 - Excavators;
 - Bull-dozers, front-end loaders, backactors;
 - Tipper trucks;
 - Graders
 - Water trucks; and
 - Low-bed truck (transporting machines on and off site).
- Access Road
 - There is a new access road required for this borrow pit. It will be 10m wide, 275 m long.

iii) Resources Required

Water

During the Mining Phase, water will be required for various purposes, such as washing of plant and equipment in dedicated areas, dust suppression, potable water for construction workers, etc. Water tankers will also supply water to the site and be used for dust suppression. All water uses triggered in terms of Section 21 of the National Water Act (Act No. 36 of 1998) (NWA) will comply with DWS' requirements. Further provisions for water uses are included in the EMP, as part of the BAR.

Sanitation

Sanitation services will be required for the construction workers in the form of chemical toilets, which will be serviced at regular intervals by the supplier.

Waste

Solid and inert waste generated during the Mining Phase will be temporarily stored at designated locations on site and will be removed at regular intervals and disposed of at approved waste disposal sites within the local municipality. All the waste disposed of will be recorded and safe disposal slips retained for review by the ECO.

Based on the Integrated Waste Management Plan for the Thabazimbi LM (2016), the Thabazimbi Landfill and the Northam Landfill are both licenced. According to the Integrated Development Plan (IDP) for the Lephalale LM (2016), there is a permitted landfill within the municipality. All storage of general or hazardous waste in a waste storage facility (e.g. onsite waste containers, skips) will comply with the National Norms and Standards (GN R. 926 of 29 November 2013). The waste storage facility will be established at the camp where waste from site will be collected, sorted, weighed and placed in skips and recycling containers for removal to service providers and appropriate registered landfill sites (hazardous and general sites, as required).

Wastewater, which refers to any water adversely affected in quality through mining-related activities and human influence, will include the following:

- Sewage;
- Water used for washing purposes (e.g. equipment, staff); and
- Drainage over contaminated areas (e.g. workshop and equipment storage areas).

Suitable measures will be implemented to manage all wastewater generated during the Mining Phase as included in the EMP_r in Part B of this report.

Electricity

Sources of electricity on site will be in the form of generators.

e) Policy and Legislative Context

Table 3: Applicable Legislation

Applicable legislation and guidelines used to compile the report	Reference where applied
<p>Constitution of the Republic of South Africa, (No. 108 of 1996) - Chapter 2 – Bill of Rights</p> <p>Everyone has the right:</p> <ul style="list-style-type: none"> • to an environment that is not harmful to their health or well-being; and • to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that <ol style="list-style-type: none"> i. prevent pollution and ecological degradation; ii. promote conservation; and iii. secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social • Section 24 – Environmental Rights. 	<p>The BAR Process for the proposed Borrow Pit D focuses on the minimisation of environmental impacts resulting from the pre-mining, mining and closure phases of the proposed project, in order to fulfil the requirements stipulated in Section 24 of the Constitution.</p>
<p>National Environmental Management Act (NEMA) (No. 107 of 1998)</p> <ul style="list-style-type: none"> • Section 24 – Environmental Authorisation (control of activities which may have a detrimental effect on the environment). • Section 28 – Duty of care and remediation of environmental damage. • Environmental management principles. • Authorities – Department of Mineral Resources (DMRE) due to proposed mining activities. 	<p>An application and BAR Process for Environmental Authorisation (EA) is being undertaken in terms of Section 24 of NEMA. Environmental management principles were also used as guidelines for the impact assessment.</p> <p>The Competent Authority (DMRE) provided guidance in the form of a pre-application meeting.</p>
<p>GN No. R 982 of 4 December 2014, as amended</p> <ul style="list-style-type: none"> • Purpose - regulate the procedure and criteria as contemplated in Chapter 5 of NEMA relating to the preparation, evaluation, submission, processing and consideration of, and decision on, applications for environmental authorisations for the commencement of activities, subjected to EIA, in order to avoid or mitigate detrimental impacts on the environment, and to optimise positive environmental impacts, and for matters pertaining thereto. 	<p>A BA Process is required in terms of the 2014 EIA Regulations, as amended, GNR 982 to 985. This is the BAR associated with the BA Process for BP D.</p>

Applicable legislation and guidelines used to compile the report	Reference where applied
<p>GN No. R. 983 of 4 December 2014, as amended (Listing Notice 1)</p> <ul style="list-style-type: none"> • Purpose - identify activities that would require environmental authorisations prior to commencement of that activity and to identify competent authorities in terms of sections 24(2) and 24D of NEMA. • The investigation, assessment and communication of potential impact of activities must follow a Basic Assessment Process, as prescribed in regulations 19 and 20 of GN No. R 982 of 4 December 2014 as amended. 	<p>This is the BAR associated with the listed activities identified in Listing Notices 1 and 3 that is triggered by the proposed Borrow Pit D.</p>
<p>GN No. R. 984 of 4 December 2014, as amended (Listing Notice 2)</p> <ul style="list-style-type: none"> • Purpose - identify activities that would require environmental authorisations prior to commencement of that activity and to identify competent authorities in terms of sections 24(2) and 24D of NEMA. • The investigation, assessment and communication of potential impact of activities must follow a Scoping and EIA Process, as prescribed in regulations 21 - 24 of GN No. R 982 of 4 December 2014. 	<p>The proposed Borrow Pit D did not trigger any activities as contained in Listing Notice 2 and therefore does not apply to the process followed.</p>
<p>GN No. R. 985 of 4 December 2014, as amended (Listing Notice 3)</p> <ul style="list-style-type: none"> • Purpose - list activities and identify competent authorities under sections 24(2), 24(5) and 24D of NEMA, where environmental authorisation is required prior to commencement of that activity in specific identified geographical areas only. • The investigation, assessment and communication of potential impact of activities must follow a Basic Assessment Process, as prescribed in regulations 19 and 20 of GN No. R 982 of 4 December 2014. 	<p>This is the BAR associated with the listed activities identified in Listing Notice 3 that is triggered by the proposed Borrow Pit D.</p>
<p>National Water Act (Act No. 36 of 1998)</p> <ul style="list-style-type: none"> • Chapter 3 – Protection of water resources. • Section 19 – Prevention and remedying effects of pollution • Section 20 – Control of emergency incidents. • Chapter 4 – Water use. • Authority – Department of Water and Sanitation (DWS). 	<p>The proposed BP D is not located within 500m from a wetland therefore a Water Use Licence (WUL) will not be required for Sections 21 (c) and (i) water uses.</p>
<p>National Environmental Management Air Quality Act (Act No. 39 of 2004)</p> <ul style="list-style-type: none"> • Air quality management 	<p>The principles and measures provided in Section 23 and 34 of NEMA:QA, will be incorporated into</p>

Applicable legislation and guidelines used to compile the report	Reference where applied
<ul style="list-style-type: none"> • Section 32 – Dust control. • Section 34 – Noise control. • Authority – DFFE 	<p>the EMPr in order to manage and minimise dust and noise activities generated by the pre-mining and mining phases of the project.</p>
<p>National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)</p> <ul style="list-style-type: none"> • Management and conservation of the country's biodiversity. • Protection of species and ecosystems. • Authority – DFFE 	<p>All threatened terrestrial ecosystems were identified in order to assess the possible impacts and baseline conditions of the project area. Due to the proposed borrow pit requiring clearance of vegetation, a terrestrial ecological impact assessment was undertaken in order to confirm the status of fauna and flora and indigenous vegetation on-site.</p>
<p>National Environmental Management: Protected Areas Act (Act No. 57 of 2003)</p> <ul style="list-style-type: none"> • Protection and conservation of ecologically viable areas representative of South Africa's biological diversity and natural landscapes. 	<p>This Act was considered when completing the desktop baseline environmental screening for protected areas/reserves in the study area.</p>
<p>National Environmental Management: Waste Act (Act No. 59 of 2008)</p> <p>Chapter 5 – licensing requirements for listed waste activities GN No. R. 921 of 29 November 2013. Authority – Minister (DFFE) or MEC (provincial authority).</p>	<p>A waste management licence is not required, however the Environmental Management Programme (EMPr) makes suitable provisions for waste management, including the storage, handling and disposal of general and hazardous waste.</p>
<p>National Forests Act (No. 84 of 1998)</p> <ul style="list-style-type: none"> • Section 15 – Authorisation required for impacts to protected trees. • Authority – DFFE 	<p>NFA Protected trees within this Borrow Pit includes <i>Combretum imberbe</i> (Leadwood), <i>Sclerocarya birrea subsp. caffra</i> (Marula) and <i>Vachellia erioloba</i> (Camel thorn).</p> <p>Protected trees will require a permit from DFFE for removal.</p>
<p>Limpopo Environmental Management Act (No.7 of 23)</p>	<p>This Act makes provision with respect to the protection and conservation of the environment in the Limpopo Province. It makes</p>

Applicable legislation and guidelines used to compile the report	Reference where applied
	<p>provision for a wide variety of matters regarding the environment including: protected areas; hunting of wild and exotic animals; the establishment of Wildlife Councils; inland fishing and the protection and aquatic systems; the protection of indigenous plants; the application of CITES; restrictions on development and environmental impact reports.</p> <p>No LEMA Protected species were found in Borrow Pit D footprint.</p>
<p>Minerals and Petroleum Resources Development Act (Act No. 28 of 2002) (MPRDA)</p> <ul style="list-style-type: none"> • The MPRDA makes provision for equitable access to and sustainable development of the nation's mineral and petroleum resources. The recent amendment MPRDA resulted in changes to align specific environmental legislation associated with mining activities and aligned sections of NEMA and MPRDA to provide for one environmental management system. • Approval of Borrow Pit D and associated infrastructure. • Authority – DMRE • Exemption as per Section 106 of the MPRDA 	<p>The DWS is exempt from applying for a Mining Right and/or Permit in terms of Section 106 of the MPRDA, however is not exempted from applying for an EA, as confirmed in the DMR pre-application meeting. An application has therefore been lodged for EA in terms of the NEMA, in respect of listed activities that have been triggered by activities in terms of the MPRDA (as amended).</p>
<p>Occupational Health & Safety Act (Act No. 85 of 1993)</p> <ul style="list-style-type: none"> • Provisions for Occupational Health & Safety. • Authority – Department of Labour. 	<p>Principles provided in this Act were incorporated into the EMPr, in order to manage activities that can impact health and safety on-site.</p>
<p>National Heritage Resources Act (Act No. 25 of 1999)</p> <ul style="list-style-type: none"> • Section 34 – protection of structure older than 60 years. • Section 35 – protection of heritage resources. • Section 36 – protection of graves and burial grounds. • Section 38 – Heritage Impact Assessment for linear development exceeding 300 m in length; development exceeding 5 000m² in extent, etc. • Authority – Limpopo Provincial Heritage Resources • Authority (LIHRA); and South African Heritage Resources • Agency (SAHRA) 	<p>The proposed development exceeds 5000m² in extent therefore a Heritage Impact Assessment is required. All principles regarding the protection of heritage resources were incorporated into the EMPr. Should the proposed project impact on any heritage resources, an application to LIHRA/SAHRA will be required to obtain the necessary permits.</p>

Applicable legislation and guidelines used to compile the report	Reference where applied
<p>National Road Traffic Act (Act No. 93 of 1996)</p> <ul style="list-style-type: none"> Authority – Limpopo Department of Public Works, Roads and Infrastructure. 	
GUIDELINES	
<ul style="list-style-type: none"> Integrated Environmental Management Information Series, in particular Series 2 – Scoping (DEAT, 2002); Guideline on Alternatives, EIA Guideline and Information Document Series (DEA&DP, 2010a); Guideline on Need and Desirability, EIA Guideline and Information Document Series (DEA&DP, 2010b); Integrated Environmental Management Guideline Series 5: Companion to the EIA Regulations 2010 (DEA, 2010a); Integrated Environmental Management Guideline Series 7: Public Participation in the EIA Process (DEA, 2010b); and Guidelines for Involving Specialists in the EIA Processes Series (Brownlie, 2005). South African National Biodiversity Institute (SANBI). 2020. Species Environmental Assessment Guideline. Guidelines for the implementation of the Terrestrial Fauna and Terrestrial Flora Species Protocols for environmental impact assessments in South Africa 	<p>All guidelines were considered during the assessment phase of the project. Where the guidelines are relevant, these have been incorporated into the report.</p>
NATIONAL AND REGIONAL PLANS	
<ul style="list-style-type: none"> Municipal Spatial Development Frameworks (SDFs) (where available); Municipal Integrated Development Plans (IDPs); Relevant national, provincial, district and local policies, strategies, plans and programmes; Environmental Management Framework (EMF) for the Waterberg District Municipality (2010); Limpopo Provincial Conservation Plan version 2, September 2013; Limpopo Environmental Management Act (Act 7 of 2003); Limpopo Provincial Growth and Development Strategy (PGDS); Department of Energy’s Integrated Resource Plan (IRP) 2010-30; Lephalale LM Water Services Development Plan (WSDP); and Crocodile River (West) Water Supply System Reconciliation Strategy. 	<p>All national and regional plans were considered when completing the baseline environmental, physical, socio-economic and existing infrastructure conditions, as well as providing input in the impact assessment.</p>

f) Need and desirability of the proposed activities

The IDP for the Lephalale LM (2016) acknowledges the need for the MCWAP and specifically states the following: “It is imperative to note that the outcome of the MCWAP project need to be implemented to address expected water shortages before any development in node area 1 will be viable, as currently the area does not have sufficient water resources to sustain any new development”. MCWAP-2A is also included as one of the strategic projects in terms of Key Performance Area 2: Basic Services and Infrastructure investment. It is noted that Thabazimbi LM’s water supply is from Magalies Water. According to the spatial vision presented in the IDP for the Thabazimbi LM (2017), the proposed footprint of MCWAP-2A falls primarily within the activity and government corridor, which extends northwards from the town of Thabazimbi (similar to Zone 11 of the Waterberg District Municipality EMF). The project aims to supply bulk water to a number of strategic end users. The Lephalale LM, as one of the intended water users, will need to ensure that it is able to optimally utilise this water as part of infrastructure planning.

The timing of the project is driven by the water demands associated with the development of the Waterberg Coalfields, where the water users include power generation, coal mining to support power generation, other industrial / mining activities and urban use by the Lephalale LM.

MCWAP-2A also features prominently on SIP 1, which aims to unlock SA’s northern mineral belt in one of the poorest provinces (Limpopo). The assurance of water supply to the current power stations near Lephalale is not acceptable and places the country’s power supply at risk. The concerns raised by Interested and Affected Parties (I&APs) with regards to the proposed project primarily fall into the following categories:

- Concerns related to the footprint of the physical infrastructure and associated impacts to land use as well as existing structures and infrastructure;
- Concerns related to water availability in the Crocodile River (West); and
- Concerns related to the cumulative impacts associated with the various developments that are linked to the Waterberg Coalfields.

Material will be required for temporary construction access roads, access tracks for future maintenance purposes and pipe bedding materials for the construction of the

pipelines. The properties of materials required for roads and pipe bedding differs and further discussed below. The overall pipeline route was divided into three separate sections (Low Lift Rising Main, High Lift Rising Main and Gravity Main) and each section is considered separately below.

Material for Road Construction

Access roads will be required for construction purposes to gain access along the pipeline servitudes and to borrow pits and spoil sites. Allowance is made for a 200mm thick gravel wearing course of 5m wide over the total distance of the pipelines to determine the volume of road building material that will be required for the Contractor's temporary works i.e. 1 m³ per metre pipeline servitude length.

At the end of the construction period an access track will be provided along the pipeline servitudes for future patrolling and maintenance purposes. The track will conform to the shape of the natural ground to prevent interference with surface drainage. Layer work will be limited to a 150 mm thick gravel layer of 3m wide in inaccessible wet and clayey areas. The volume of material required for the access track will be small in comparison with the volumes that will become available when the Contractor removes his temporary access road. Sufficient material will therefore be available from the removal of the temporary access road and no allowance is made for additional material to construct the access track.

The total volume of material required for the construction of access roads are as follows for each of the three pipeline sections:

Low Lift Rising Main = 5 850 m³

High Lift Rising Main = 29 150 m³

Gravity Main = 101 300 m³

Pipeline Bedding Material

The total imported material from the borrow pits are; 29 600 m³, 117 100 m³ and 360 500 m³ for the Low Lift, High lift and Gravity pipelines respectively. The required volume of imported material from borrow pits is a result of the rock and unsuitable bedding material quantities from pipe trench excavations which will need to be replaced.

The test pits within each borrow pit were analysed in terms of the acceptable material classification and the total amount of acceptable material was quantified based on the functional area of the borrow pit and the average depth. The close proximity of the borrow pits in relation to the pipeline was imperative in determining the suitability of the borrow pit in order to optimize short haulage routes. The material borrowed will be replaced by the unsuitable material from the pipe trenches and each borrow pit will be rehabilitated.

The analyses of the Low Lift Rising Main resulted in 29 600 m³ of unsuitable material which will need to be imported from the borrow pits. Excess material from the Diversion Weir excavations and BP SS1 (“old borrow pits”) will be utilised as a source of imported material.

The analyses of the High Lift Rising Main resulted in 117 100 m³ of unsuitable material which will need to be imported from borrow pits. Three borrow pits i.e. BP25, 30A and 35 (“old borrow pits”) were identified to provide suitable material to the pipeline based on their suitability of bedding material, capacity of the borrow pits and proximity in relation to the pipeline.

The analyses of the Gravity Main resulted in 360 500 m³ of unsuitable material which will need to be imported from the borrow pits. Fourteen (14) borrow pits were identified to provide suitable material to the pipeline based on their suitability of bedding material, capacity of the borrow pits and proximity in relation to the pipeline. Amongst the 14 borrow pits, is Borrow Pit D which is located at Chainage 11500 and material to be borrowed is 100 000m³.

Table 4: Summary of “New” Borrow Pits and Borrow Material Quantities

BP No.	CH(m)	Estimated Volumes Available (m ³)		Recommended for Implementation
		Pipe Bedding	Road Gravel	
High Lift Rising Main				
BP B	1 500	20 000	28 000	Yes
BP D	11 500	100 000	20 000	Yes*
BP L	25 500	Not suitable	12 000	No
Gravity Main				
BP E	3 600		12 000	Yes
BP F (ALT)	11 100	16 000	4 500	Yes*
BP G	13 600	Not suitable	20 000	Yes*

BP F	18 100	16 000	12 000	No
BP H	30 600	100 000	>10 000	Yes*
BP I (ALT)	41 800	>100 000	0	No
BP I	41 800	>100 000	0	No
BP J	75 100	100 000	0	Yes

***Borrow pit not used in mass haul assessments but recommended as back-up sources.**

A desktop study was initially conducted whereby potential borrow areas were identified, based on geology, anticipated weathering, topography and vegetation. A total of 16 borrow pits were planned for investigation after the desktop study. Thereafter, a site reconnaissance was conducted during which actual site conditions were observed and assessed with regard to access, visible suitable material, drainage, vegetation and topography. During this phase, the number of borrow areas were reduced by eliminating those that are considered to be unviable. After carrying out the field reconnaissance the total number of borrow pits was revised to twelve (12) borrow pits; i.e. Borrow Pit A to L. Of the twelve (12); two (2) were cancelled to due to environmental constraints (A and C), one (1) was cancelled due to access constraints (K). Two alternative positions close to Borrow Pit F and borrow Pit I were also investigated.

The test pits excavated at each of the borrow pits are summarised in Table 10 of the Geotechnical Factual Report. The borrow pits included a minimum of seventeen test pits each, for Borrow Pit D there were 19 test pits completed.

According to the Geotechnical Factual Report, Borrow pits L, F, I, and I (Alternative) were **not** recommended for use during implementation of MCWAP-2A. This is due to the results of the pipeline design requirements, the availability of suitable in-situ and borrow pit material, the material haulage assessment and environmental constraints, the conclusion is that sufficient volumes of material are available from other borrow pits as part of this project in the areas where these borrow pits are located.

g) Motivation for the overall preferred site, activities and technology alternative

Borrow pit investigations were aimed at locating bedding and selected fill blanket material with the following minimum quality characteristics:

- Maximum particle size of 19 mm;
- Not more than 95% passing the 13.2 mm sieve;
- Not more than 20% passing the 0.425 mm sieve; and
- PI less than 12.

The Geotechnical Factual Report (Appendix D) confirmed the locations of the required borrow pits using the above criteria as well as taking into consideration environmental factors, access and land use. The proposed sites were identified for suitability of material and to provide the required volumes that would have to be excavated and used as construction material for MCWAP-2A. Furthermore, all proposed borrow pits fall in close proximity to the MCWAP-2A pipeline servitude, in order to minimise the need for new access/haul roads.

To minimise impacts, the proposed pipeline route and associated borrow pits attempt to remain alongside existing linear-type infrastructure, such as roads (main roads and dirt roads), the railway line (i.e. section of approximately 56km), transmission lines, industrial corridors and farm boundaries where the environment is regarded as less sensitive.

The environmental sensitivities that occur on site have been assessed by specialist investigations. The findings and recommendations of the specialist studies have been incorporated into the Impact Assessment Section of this report.

h) Full description of the process followed to reach the proposed preferred alternatives within the site

i) Details of the development footprint alternatives considered

In situ material from the pipeline construction site was investigated for use as pipe bedding and road construction material. Insufficient volumes of suitable in-situ material are available and borrow pits are required to supplement the shortfall in material. In situ material will be used as first priority and the shortfall in material will be obtained from borrow pits.

A geotechnical investigation has been undertaken of the Borrow Pit D area to determine the quality and quantity of available material. Results of the geotechnical investigation was used to determine the extent of Borrow Pit D. The geotechnical investigation results, environmental considerations and social/land owner impacts were considered when the borrow pit area was laid out. To minimize environmental/social/land owner impacts the borrow pit size has been limited to the minimum required and has been located as close as possible to the project infrastructure and as remote as possible from existing farm buildings to limit the impact of mining operations on the land owner.

ii) Details of the Public Participation Process (PPP) Followed

According to Section (2)(4)(f) and (o) of the Act:

- The participation of all Interested and Affected Parties (I&APs) in environmental governance must be promoted and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation, and participation by vulnerable and disadvantaged persons must be ensured, and
- The environment is held in public trust for the people, the beneficial use of environmental resources must serve the public interest and the environment must be protected as the people's common heritage.

The PPP (Figure 4) will be in accordance with the EIA Regulations 2014, as amended for the proposed Borrow Pit D allowed for the following:

- to provide for all role players including potential and RI&APs, EAPs, state departments, organs of state, and the competent authority (CA) to obtain clear, accurate and understandable information about the environmental impacts of the proposed activity or implications of a decision – *this will be achieved by announcing the proposed borrow pits in newspapers, notice boards, meetings and via email;*
- to provide for role- players to voice their support, concerns and questions regarding the project application or decision – *a transparent and open PPP will be conducted which allow for all RI&APs to express their concerns about the project, the RI&APs were also provided with the opportunity to comment on all documents released on the project;*
- to provide the opportunity for role-players to suggest ways for reducing or mitigating any negative impacts of the project and for enhancing its positive impacts – *landowners and other RI&APs will contribute to the identification of impacts and potential mitigation measures during the site visits;*
- to enable the person conducting PP to incorporate the needs, preferences and values of potential or RI&APs into its proposed development that becomes the subject of an application for an environmental authorisation (EA) – *issues raised will be presented to the technical team and thereafter incorporated into this report and considered in the specialist studies;*
- to provide opportunities for clearing up misunderstandings about technical issues, resolving disputes and reconciling conflicting interests – *a comment period allows*

for RI&APs to obtain clarity on any issues that may arise from the review of the BAR and a Comments and Responses Report will be compiled to keep a record of all comments received;

- to encourage transparency and accountability in decision-making –*the PPP will be conducted according to the EIA Regulations, 2014 as amended;*
- to contribute toward maintaining a healthy, vibrant democracy; and
- To give effect to the requirement for procedural fairness of administrative action as contained in the Promotion of Administrative Justice Act, 2000 (Act No. 3 of 2000).

Establishing an understanding of who may be impacted required that the following aspects be considered:

- Spatial influence of the project- the impacts of a project change in relation to the distance from the project site. People living immediately adjacent to a project site will be directly impacted by construction impacts of noise and dust. *Landowners, occupiers and/or persons in control of land affected by or adjacent to the footprint of the MCWAP-2A's physical infrastructure.*
- Nature of the impact - there are direct impacts, such as the loss of topsoil which reduces the productive capacity of land. A secondary impact would be siltation of dams downstream. For this project, the secondary effects of the obvious impacts as they may affect different stakeholders were considered. *Rate payers associations, agricultural groups, etc. were considered around the project footprint.*
- Impacts associated with different phases of the project, impacts vary with the project life cycle. *Organs of state having jurisdiction in respect of any aspect of the activity; the municipality which has jurisdiction in the area (Waterberg District Municipality, Thabazimbi Local Municipality and Lephalale Local Municipality); the municipal councillors of the wards in which the project footprint site is situated;*
- Different components of the receiving environment- consideration was given to I&APs associated with each component of the receiving environment, these being the social, cultural, economic, biophysical environments. Sensitive natural features (protected areas, nest sites, threatened habitats), social facilities (schools, hospitals, recreational areas/sites) or cultural sites (graveyards, ancestral, historic sites, and archaeological features) that will be impacted by different impacts in different phase within the spatial influence of the project were considered. *Specific interest groups (e.g. environmental, socio-economic; education).*

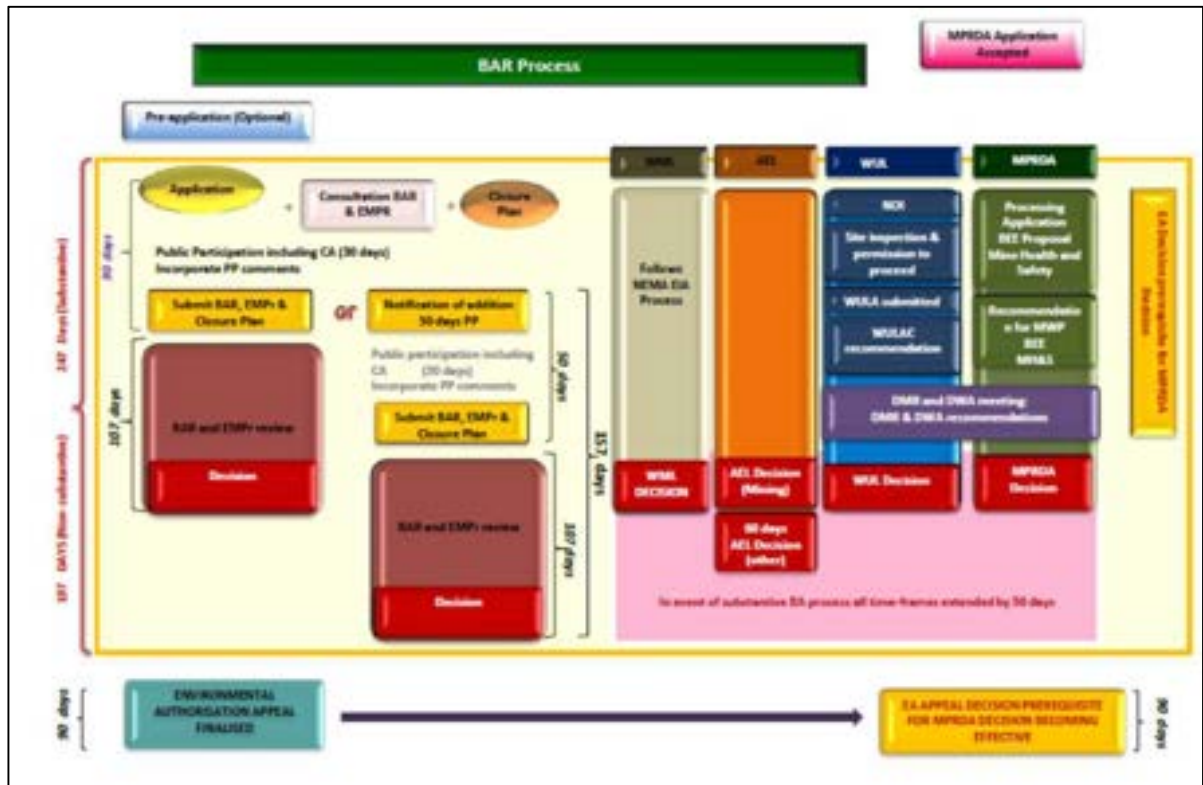


Figure 4: The Basic Assessment Process including the PPP (DFFE, 2017)

iii) **Summary of issues raised by I&APs**
 (Complete the table summarising comments and issues raised, and reaction to those responses)

Table 5: Issues raised by RI&APs

Interested and Affected Parties		Date	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.		Comments Received			
<u>AFFECTED PARTIES</u>					
Landowner/s	X				
Lawful occupier/s of the land					
Landowners or lawful occupiers on adjacent properties	X				
Municipal councillor	X				
Municipality	X				
Organs of state (Responsible for					

infrastructure that may be affected Roads Department, Eskom, Telkom, DWA e					
Communities					
Dept. Land Affairs					
Traditional Leaders					
Dept. Environmental Affairs					
Other Competent Authorities affected					
<u>OTHER AFFECTED PARTIES</u>					
<u>INTERESTED PARTIES</u>					

iv) **The Environmental attributes associated with the alternatives**

(1) **Baseline Environment**

(a) **Type of environment affected by the proposed activity**

CLIMATE

The information to follow, was obtained from the South African Weather Service for the weather stations situated in Thabazimbi and Lephalale.

Temperature – Thabazimbi and Lephalale

Average daily maximum and minimum temperatures for the last ten years measured at the weather station in Thabazimbi and Lephalale, are shown in Table 6 and Table 7 respectively.

Table 6: Average Temperature (°C) by month– Thabazimbi station

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature (°C)	25.4	25.3	23.5	21.1	16.8	13.9	14.1	17.6	22.1	24.4	24.8	25.9
Min. Temperature (°C)	19.4	19.3	17.4	13.7	8.4	4.8	5.1	8.8	14.2	17.4	18.3	19.4
Max. Temperature (°C)	31.4	31.3	29.7	28.5	26.3	23	23.1	26.4	30	31.5	31.4	32.4
Avg. Temperature (°F)	77.7	77.5	74.3	70.0	62.2	57.0	57.4	63.7	71.8	75.9	76.6	78.6
Min. Temperature (°F)	66.9	66.7	63.3	56.7	47.1	40.6	41.2	47.8	57.6	63.3	64.9	66.9
Max. Temperature (°F)	88.5	88.3	85.5	83.3	77.5	73.4	73.6	79.5	86.0	88.7	88.5	90.3
Precipitation / Rainfall (mm)	102	119	100	33	7	4	2	2	9	42	62	112

Thabazimbi lies on 974m above sea level. The climate is considered to be a local steppe climate. There is not much rainfall in Thabazimbi all year long. This climate is considered to be BSh according to the Köppen-Geiger climate classification. The average annual temperature in Thabazimbi is 21.2 °C. The annual rainfall is 594 mm.

December is the warmest month of the year. The temperature in December averages 25.9 °C. At 13.9 °C on average, June is the coldest month of the year. There is a difference of 117 mm of precipitation between the driest and wettest months. The variation in annual temperature is around 12.0 °C.

Table 7: Average Temperature (°C) by month– Lephale station

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature (°C)	26	25.2	23.8	21.1	17.4	14	14.1	17	21.3	23.5	24.7	25.6
Min. Temperature (°C)	19.5	18.9	16.9	13.4	8.2	4.4	4.5	7.8	12.4	15.6	17.8	18.9
Max. Temperature (°C)	32.5	31.6	30.7	28.8	26.6	23.6	23.7	26.5	30.2	31.4	31.6	32.4
Avg. Temperature (°F)	78.8	77.4	74.8	70.0	63.3	57.2	57.4	62.6	70.3	74.3	76.5	78.1
Min. Temperature (°F)	67.1	66.0	62.4	56.1	46.8	39.9	40.1	45.7	54.3	60.1	64.0	66.0
Max. Temperature (°F)	90.5	88.9	87.3	83.8	79.9	74.5	74.7	79.7	86.4	88.5	88.9	90.3
Precipitation / Rainfall (mm)	91	76	56	25	4	3	2	4	8	31	67	70

Lephale lies on 829m above sea level. Lephale is influenced by the local steppe climate. There is not much rainfall in Lephale all year long. This climate is considered to be BSh according to the Köppen-Geiger climate classification. The average temperature in Lephale is 21.1 °C. In a year, the rainfall is 437 mm.

GEOLOGY

The large geographical extent of the MCWAP-2A pipeline crosses over multiple geological supergroups and formations.

The southern portion of the MCWAP-2A pipeline crosses over the Chuniespoort Group (dolomite and iron-stone lithologies) and Pretoria Group (shale, quartzite and lava lithologies) of the Transvaal Supergroup, which comprises the oldest geological units. Quaternary sandy alluvial deposits are present along the banks of the Crocodile River. The iron-stone lithology as part of the Transvaal Supergroup is of economic importance. Structurally the Transvaal Supergroup units have a shallow (15° to 30°) dip towards the south-east as a result of the later intrusion of the Bushveld Complex. The Transvaal Supergroup is highly faulted (east-west striking) however the faults are typically limited in their extent. Underlying the Transvaal Supergroup are the volcanic rocks of the Ventersdorp Supergroup (GBN Joint Venture, 2020) (Nemai Consulting, 2018) (WSM Leshika, 2020).

The central portion of the MCWAP-2A pipeline crosses over the Waterberg Group which mainly comprises sandstone lithologies. The Waterberg Group formations have a slight northerly dip direction (in the south) which becomes almost horizontal in the north. The

Waterberg Group has been extensively intruded by diabase dykes and sills of Molokian Age. Prominent northeast and north-west striking lineaments are attributed to the diabase dykes (GBN Joint Venture, 2020) (Nemai Consulting, 2018) (WSM Leshika, 2020).

The northern portion of the MCWAP-2A pipeline crosses over the youngest geological unit, the Karoo Supergroup, which comprises of sandstone, siltstone, shale, mudstone and coal lithologies. The Karoo Supergroup is unconformably overlain by Quaternary Sands. The coal lithologies of the Karoo Supergroup are of economic importance and is the driving force of development in the Lephalale Area. The Karoo Supergroup formations are sub-horizontal and extensively faulted. Faults have been mapped for significant distances. The Eenzaamheid Fault forms the southern boundary of the Waterberg Coalfield deposits. The MCWAP-2 pipeline is generally located south of this fault except for a small section near Medupi Power Station (GBN Joint Venture, 2020) (Nemai Consulting, 2018) (WSM Leshika, 2020).

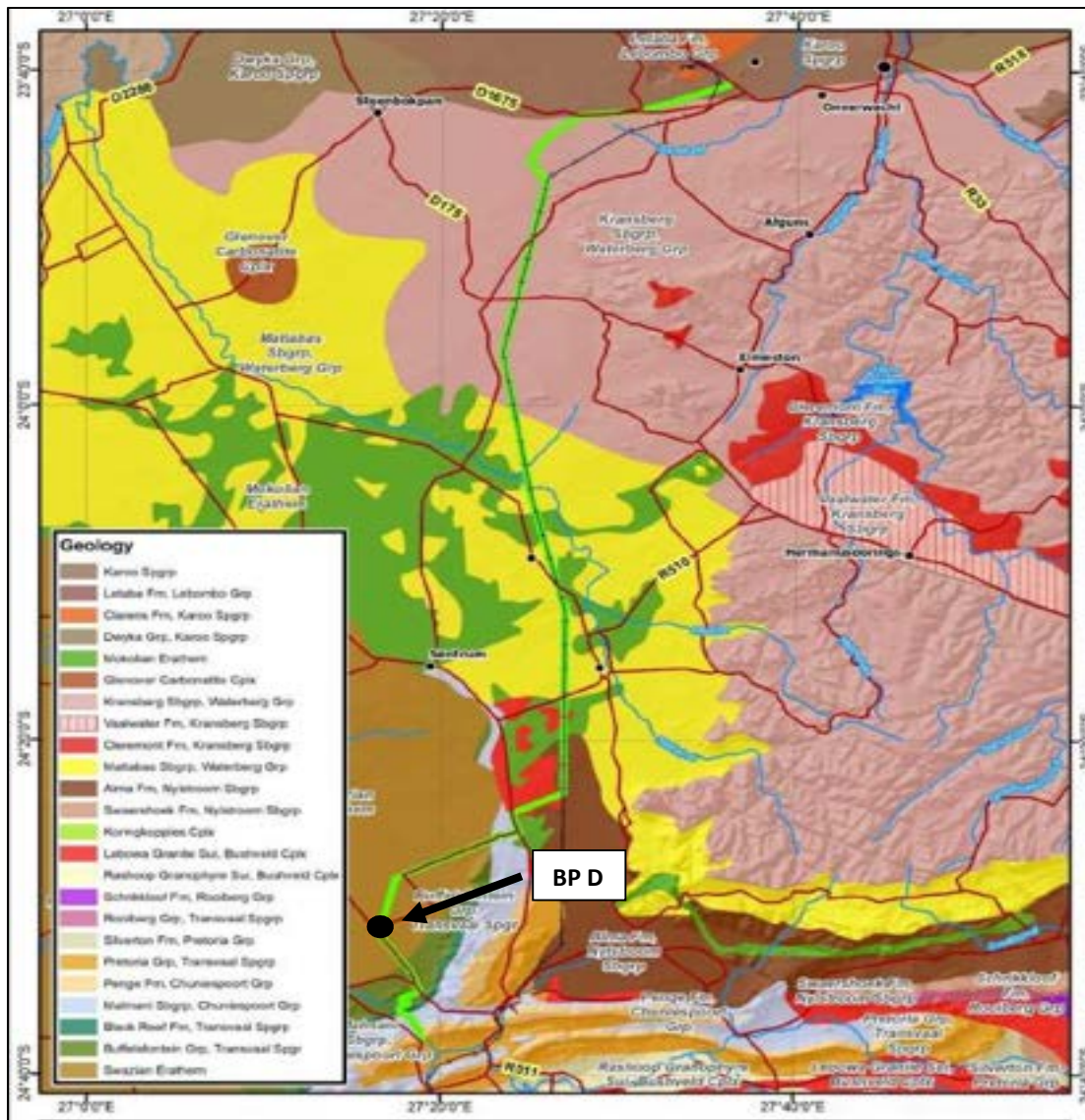


Figure 5: Geology of Borrow Pit D (Digby Wells, 2020)

Geology of Borrow Pit D comprise of Swazian Erathem. According to the geotechnical report and test pit results, the proposed site is suitable for the proposed borrow pit.

TOPOGRAPHY AND DRAINAGE

The topography of the MCWAP-2A pipeline comprises low mountains (near Thabazimbi) and flat undulating plains underlying most of the pipeline route. The abstraction weir at Vlieëpoort (near Thabazimbi) is located in a narrow valley in the Vlieëpoort mountains which have an elevation high of 1400 mamsl (mountains) and an elevation low of less than 900 mamsl (in the riverbed). The elevation of Lephalale is approximately 829 mamsl (WSM Leshika, 2020) (GBN Joint Venture, 2020) (Nemai Consulting, 2018).

The MCWAP-2A pipeline is located in the Limpopo Water Management Area (WMA1) and transects the quaternary catchments A24C, A24H, A24F, A24J and A41C. The drainage systems linked to these quaternary catchments include the perennial Crocodile River (West) and ephemeral Bierspruit, Sandspruit and Matlabas Rivers. These rivers drain the catchments in a northerly / north-westerly direction towards the Limpopo River.

The river systems have been transformed by the construction of weirs which modify surface water flow and habitats along these systems (The Biodiversity Company, 2018). The upstream catchment of the Crocodile River (West) comprises of extensive agricultural, industrial and urban land uses (draining water from Johannesburg (northern suburbs), Pretoria (Metropolitan region), Thabazimbi and Rustenburg. The industries directly associated with the MCWAP-2 weir location on the Crocodile River (West) include game, livestock and agricultural (irrigated) farming practises and iron-ore mining operations (The Biodiversity Company, 2018).

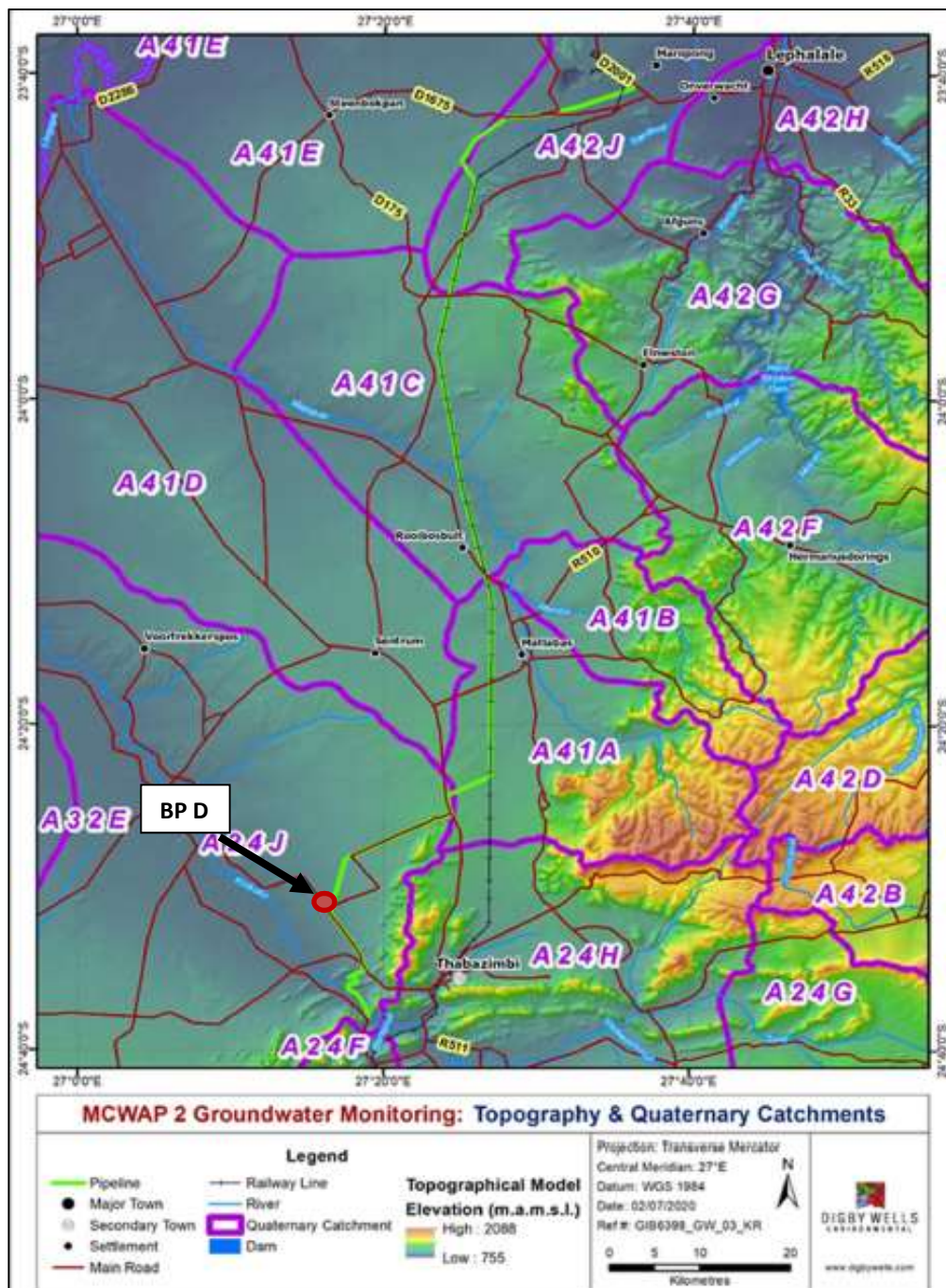


Figure 6: Topography and Drainage of Borrow Pit D (Digby Wells, 2020)

Borrow Pit D is situated in the A24J Quaternary Catchment and within the low topography range according to the topography model illustrated in Figure 6.

AGRICULTURE



Figure 7: Agricultural Sensitivity (DFFE, 2020)

According to the DFFE Screening Tool (Figure 7), the agricultural sensitivity of the site is very high.

SOIL POTENTIAL

Dryland crop potential are mainly determined by climate and soils. The entire project area is not recognized as a rain fed cropping area and crop production only takes place where irrigation water is available.

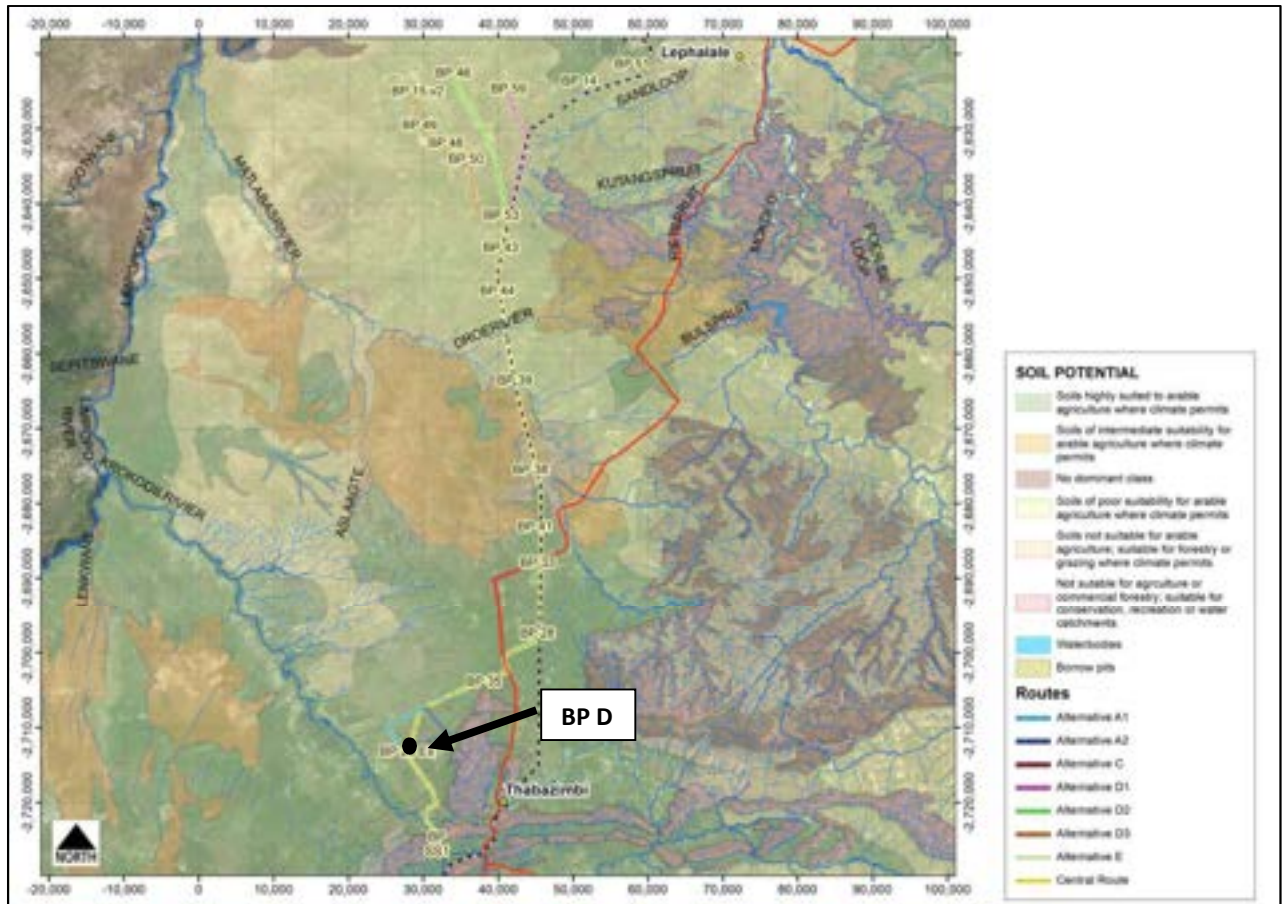


Figure 8: Soil Potential Map

The soils at Borrow Pit D are soils considered to be highly suitable to arable agriculture where climate permits (according to the Soil Potential Map in Figure 8 above). The proposed site for Borrow Pit D on the property is currently not used for agricultural purposes.

HERITAGE AND CULTURAL SIGNIFICANCE

According to the DFFE Screening Tool, the site is considered low sensitivity. Upon the completion of a Heritage Impact Assessment (HIA) (G&A Heritage, October 2020) as found in Appendix D, it was confirmed that there are no sites of heritage significance within the proposed footprint.

Figure 9 below indicates the GPS track paths used to assess the heritage features on the Borrow Pit D site.

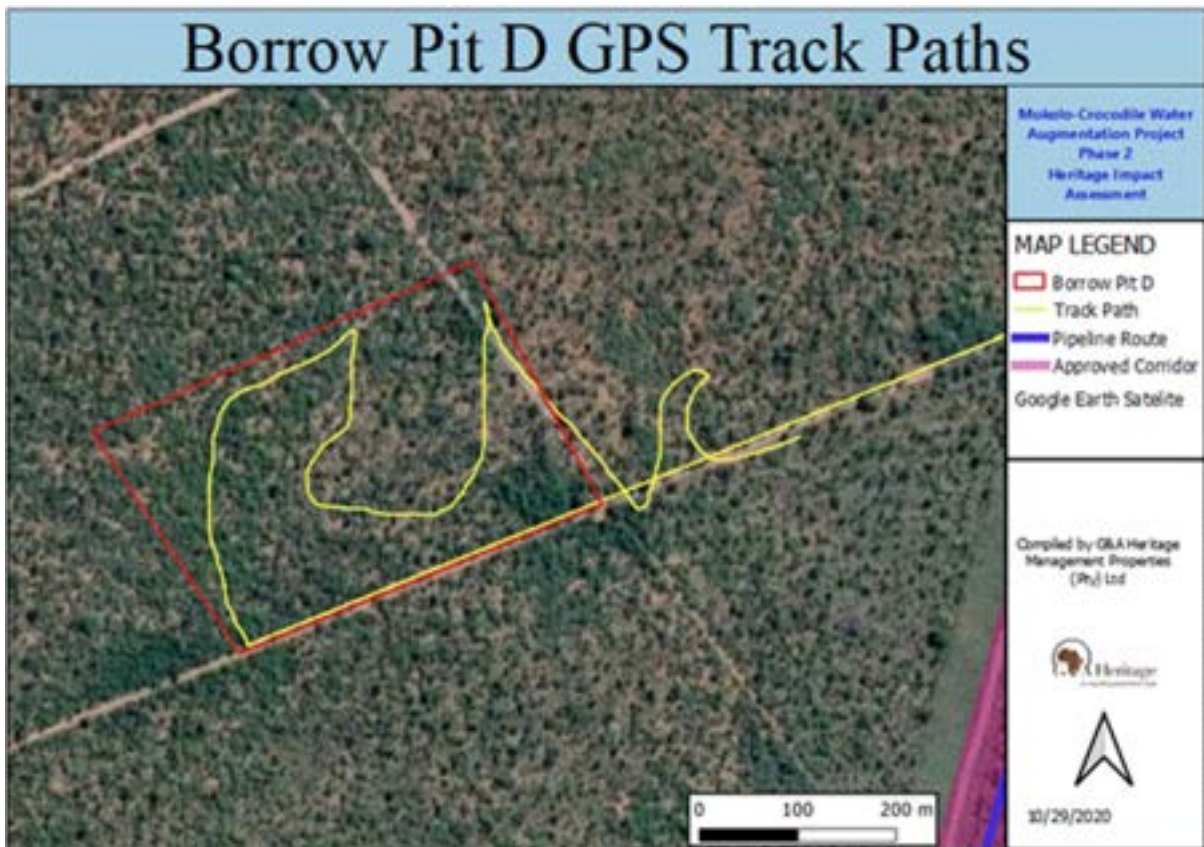


Figure 9: GPS track paths for Borrow Pit D (G&A Heritage, 2020)

PALEONTOLOGY



Figure 10: Palaeontological Sensitivity for Borrow Pit D (ASG Geo Consultants, 2020)

According to the Palaeontology Impact Assessment (PIA) (ASG Geo Consultants, October, 2020) in Appendix D, the site for Borrow Pit D is considered to be low in sensitivity and there were no fossils discovered on this site.

(b) Description of the current land uses

The proposed Borrow Pit D is located on a privately-owned property with open bush/woodland. The Dwaalboom Thornveld Habitat within this Borrow Pit included native floral communities with some encroachment by indigenous woody species present. The habitat remains representative of the reference state, and disturbances are not extensive.



Figure 11: Habitat unit map for Borrow Pit D site (STS, 2021)

(c) Description of specific environmental features and infrastructure on the site.

Only a small stretch of degraded habitat is associated with this borrow pit, which comprises a stretch of cleared vegetation along a powerline (servitude). The servitude does not have adverse impacts to the remaining floral communities in this borrow pit. Vegetation structure = short to tall, open grassland.

The Dwaalboom Thornveld Habitat within this Borrow Pit included native floral communities with some encroachment by indigenous woody species present. The

habitat remains representative of the reference state, and disturbances are not extensive. Vegetation structure = short to tall, open to closed thicket. Three species from the list of protected trees under the NFA were recorded within this habitat unit, namely *Combretum imberbe*, *Sclerocarya birrea subsp. caffra* and *Vachellia erioloba* (Borrow Pit D).

The habitat within the borrow pit comprised of a dense grass sward and relatively dense woody structure. Although well vegetated, many of the plant species present are considered unpalatable and as such, limits food resources for herbivorous mammals. Very few signs of mammal species were observed, with only tracks of *Phacochoerus africanus* (Warthog) observed. It is possible that current farming/land use activities (cattle farming and potentially adhoc hunting) are limiting factors for larger mammal occupation. The lack of suitable prey animals further impedes the potential occurrence of predators.

Amphibian diversity will be low and restricted to water independent amphibians, however, the inverse is expected for reptiles, although likely limited to common species. Habitat and food resources are likely sufficient to support an abundance of insectivorous herpetofauna and larger predatory snakes. *Python natalensis* (Southern African Python) may utilise this area for foraging, however given the limited food resources for this larger snake, it will likely not stay in the borrow pit locality for extended periods of time nor will it be reliant on the habitat within the borrow pit for survival.

(d) Environmental and current land use map.

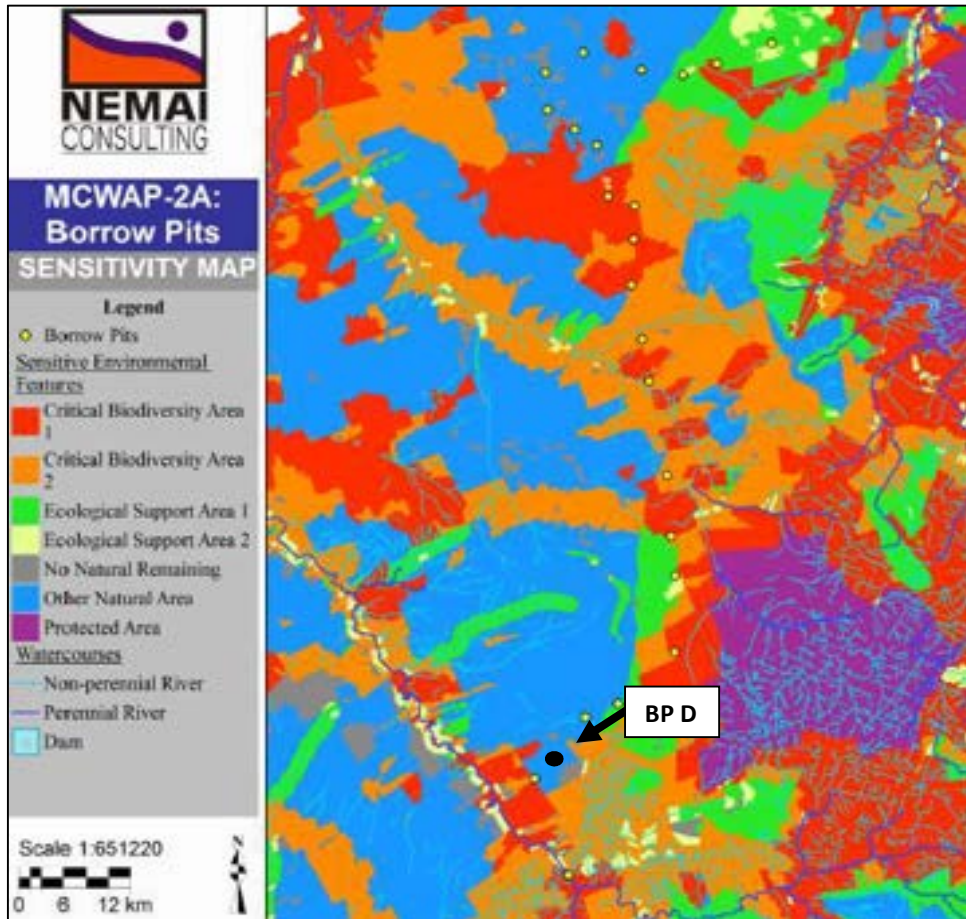


Figure 12: Environmental Sensitivity Map indicating BP D in a natural area (Nemai, 2019)

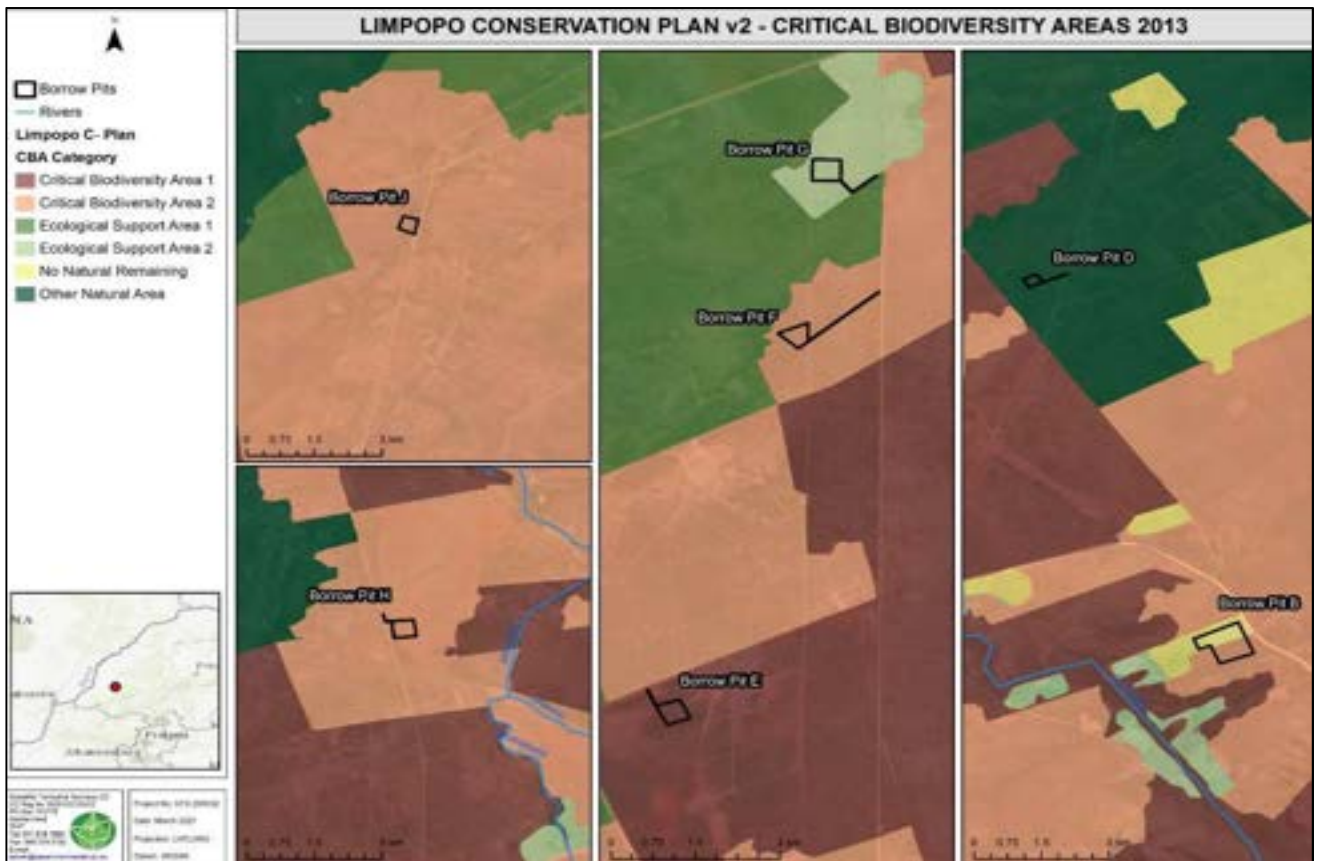


Figure 13: CBA Category of Borrow Pit D (STS, 2021)

v) **Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts**

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability, and duration of the impacts. Please indicate the extent to which they can be reversed, the extent to which they may cause irreplaceable loss of resources, and can be avoided, managed or mitigated).

Table 8: Potential Environmental Impacts

Environmental Aspect	Construction and Operational Phase Impacts
Land Use	<ul style="list-style-type: none"> Fragmentation of farm/farm portions due to fencing of borrow pit and access/haul roads; Disruptions and alternations to existing land use;
Climate	<ul style="list-style-type: none"> Possible emission of greenhouse gases during the pre-mining and mining phases of borrow pit.
Geology	<ul style="list-style-type: none"> Blasting related impacts. Sourcing of construction aggregate and associated impacts (e.g. borrow pits, haul roads). Disposal of overburden/spoil material. Excavation of required material within borrow area.
Geohydrology	<ul style="list-style-type: none"> Potential contamination of groundwater during the site clearing and mining stage. Contamination of groundwater from poor stormwater management, spills and leaks of Hazardous Chemical Substances (HCS) during operation of borrow area, insufficient bunding of HCS, oil and petrol spills from stagnant vehicles on site.
Soil	<ul style="list-style-type: none"> Removal of topsoil;

Environmental Aspect	Construction and Operational Phase Impacts
	<ul style="list-style-type: none"> • Soil erosion (e.g. steep terrain and instream works); and • Soil contamination through poor mining practices and inadequate management of HCS (e.g. fuel, oil).
Topography	<ul style="list-style-type: none"> • Erosion on steep slopes created by excavation activities; • Alteration of the natural topography of the borrow area.
Terrestrial Ecology - Flora	<ul style="list-style-type: none"> • Destruction of indigenous flora during site establishment; • Loss of vegetation due to fuel and chemical spills; • Management of alien invasive species; • Loss of topsoil and erosion; • Loss of SCC; • Damage to plant life outside of the project area.
Terrestrial Ecology - Fauna	<ul style="list-style-type: none"> • Biodiversity Act, 2004 (Act No. 10 of 2004) • NEMBA (Act 10 of 2004): Threatened or Protected Species Regulations • Loss and displacement of animals on site; • Disturbance to animals outside of project area;
Socio-economic environment	<ul style="list-style-type: none"> • Increased traffic on public and private roads; • Local road conditions; • Increase in noise and dust; • Influx of workers and people seeking employment; • Worker health and safety; • Security and increase in crime; • Damage to property; • Job creation and skills development; • Recreational or tourism business impacts; • Loss of productive land or business value; • Disruption of daily living activities; and • Temporary road closures.
Air Quality	<ul style="list-style-type: none"> • Alteration of air quality/air pollution; and • Excessive dust levels as a result of construction and operational activities.
Noise	<ul style="list-style-type: none"> • Excessive noise levels as a result of construction and operational activities; • Noise impacts from machinery (screener, crusher) and use of access/haul roads; • Blasting operations (if required); and • Altered ambient noise levels.
Historical and Cultural Features	<ul style="list-style-type: none"> • Risk of heritage and cultural resources being identified and damaged / destroyed through vegetation clearance and operational/mining activities.
Existing Structures & Infrastructure	<ul style="list-style-type: none"> • Disruptions of existing services (boreholes, powerlines, pipelines) • Relocation of infrastructure; • Borrow pit domain close to existing households; • Use of existing private roads as access//hauling
Aesthetics	<ul style="list-style-type: none"> • Visual quality and sense of place affected by mining activities. • Noise and dust generated from blasting affecting households/infrastructure in close proximity to borrow areas; • Light pollution; and • Inadequate reinstatement and rehabilitation of borrow pit footprint.
Traffic and Access	<ul style="list-style-type: none"> • Poor road conditions; • Disruptions to existing road users; • Safety risks; • Crossing main roads; • Increase in dust levels; • Poor road maintenance;
Solid Waste	<ul style="list-style-type: none"> • Waste generated from construction activities; • Domestic waste; • Hazardous waste (e.g. chemicals, oils, soil contaminated by spillages, diesel rags).

Environmental Aspect	Construction and Operational Phase Impacts
	<ul style="list-style-type: none"> • Wastewater (sanitation facilities, washing of plant, operations at the batching plant, etc.). • Disposal of excess spoil material (soil and rock) generated as part of the bulk earthworks.

vi) Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;

The EIA quantitative impact assessment focuses on the direct and indirect impacts associated with the project. All impacts will be analysed with regard to their nature, extent, magnitude, duration, probability and significance. The following definitions and criteria apply:

Nature (/Status)

The project could have a positive, negative or neutral impact on the environment.

Extent

- Local - extend to the site and its immediate surroundings.
- Regional - impact on the region but within the province.
- National - impact on an interprovincial scale.
- International - impact outside of South Africa.

Magnitude

- Degree to which impact may cause irreplaceable loss of resources.
- Low - natural and social functions and processes are not affected or minimally affected.
- Medium - affected environment is notably altered; natural and social functions and processes continue albeit in a modified way.
- High - natural or social functions or processes could be substantially affected or altered to the extent that they could temporarily or permanently cease.

Duration

- Short term - 0-5 years.
- Medium term - 5-11 years.

- Long term - impact ceases after the operational life cycle of the activity either because of natural processes or by human intervention.
- Permanent - mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.

Probability

- Almost certain - the event is expected to occur in most circumstances.
- Likely - the event will probably occur in most circumstances.
- Moderate - the event should occur at some time.
- Unlikely - the event could occur at some time.
- Rare/Remote - the event may occur only in exceptional circumstances.

Significance

Provides an overall impression of an impact's importance, and the degree to which it can be mitigated. The range for significance ratings is as follows-

- 0 – Impact will not affect the environment. No mitigation necessary.
- 1 – No impact after mitigation.
- 2 – Residual impact after mitigation.
- 3 – Impact cannot be mitigated.

Information provided by specialists will be used to calculate an overall impact score by multiplying the product of the nature, magnitude and the significance of the impact by the sum of the extent, duration and probability based on the following equation:

Overall Score = (N x M x S) x (E + D + P) Where:

N = Nature

M = Magnitude

S = Significance

E = Extent

D = Duration

P = Probability

Table 9: Impact Methodology

Nature				
Negative		Neutral		Positive
-1		0		+1
Extent				
Local	Regional		National	International
1	2		3	4
Magnitude				
Low		Medium		High
1		2		3
Duration				
Short term (0-5years)		Medium Term (5-11 years)	Long Term	Permanent
1		2	3	4
Probability				
Rare/Remote	Unlikely	Moderate	Likely	Almost certain
1	2	3	4	5
Significance				
No Impact/None		No Impact After Mitigation/Low	Residual Impact After Mitigation/Medium	Impact Cannot be Mitigated/High
0		1	2	3

Table 10: Ranking of overall impact score

Impact Rating	Low/Acceptable Impact	Medium	High	Very High
Score	0 to -30	-31 to -60	-61 to -90	-91 to -117

- vii) The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected.**

Refer to Table 11 and Section i for potential positive and negative impacts associated with Borrow Pit D.

- viii) The possible mitigation measures that could be applied and the level of risk.**

Refer to Section i of this report for mitigation measures.

ix) Motivation where no alternative sites were considered.

A desktop study was initially conducted whereby potential borrow areas were identified, based on geology, anticipated weathering, topography and vegetation. A total of 16 borrow pits were planned for investigation after the desktop study. Thereafter, a site reconnaissance was conducted during which actual site conditions were observed and assessed with regard to access, visible suitable material, drainage, vegetation and topography. During this phase, the number of borrow areas were reduced by eliminating those that are considered to be unviable.

After carrying out the field reconnaissance the total number of borrow pits was revised to twelve (12) borrow pits; i.e. borrow pit A to L. Of the twelve (12); two (2) were cancelled due to environmental constraints (A and C), one (1) was cancelled due to access constraints (K). Two alternative positions close to borrow pit F and borrow pit I were also investigated.

The test pits excavated at each of the borrow pits are summarised in Table 10 of the Geotechnical Factual Report in Appendix D. The borrow pits included a minimum of seventeen test pits each. There were 19 test pits excavated for Borrow Pit D.

x) Statement motivating the alternative development location within the overall site.

In situ material from the pipeline construction site was investigated for use as pipe bedding and road construction material. Insufficient volumes of suitable in-situ material are available and borrow pits are required to supplement the shortfall in material. In situ material will be used as first priority and the shortfall in material will be obtained from borrow pits.

A geotechnical investigation has been undertaken of the Borrow Pit D area to determine the quality and quantity of available material. Results of the geotechnical investigation was used to determine the extent of Borrow Pit D. The geotechnical investigation results, environmental considerations (topography, geology and vegetation) and social/land owner impacts were

considered when the borrow pit area was laid out. To minimize environmental/social/land owner impacts the borrow pit size has been limited to the minimum required and has been located as close as possible to the project infrastructure and as remote as possible from existing farm buildings to limit the impact of mining operations on the land owner.

xi) Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity.

The process undertaken for this BAR was conducted in accordance with Appendix 1 of the EIA Regulations, 2017 as amended. A Geotechnical Assessment was conducted to determine reasonable and feasible alternatives for Borrow Pit D. Test Pits were excavated and the results were used to select the preferred site alternative. The extent and location of the borrow pit together with the environmental aspects assessed at a desktop level and a review of the Listing Notices was used to determine the legislative context within which the proposed activity is located and the environmental process to be undertaken, this was later confirmed by the Competent Authority i.e. the DMRE.

A detailed desktop assessment followed by a site assessment by the EAP was conducted to determine potential impacts and to identify the specialist studies that are required. The following specialists' studies were conducted to determine the nature, significance, consequence, extent, duration and probability of the impacts identified:

- Aquatic Impact Study;
- Terrestrial Ecological Impact Assessment;
- Heritage Impact Assessment;
- Agricultural Impact Assessment;
- Socio-Economic Impact Assessment;
- Ecological Impact Assessment;
- Wetland Impact Assessment; and
- Geohydrological Impact Assessment.

The specialists assessed whether there were any fatal flaws associated with the project. All possible impacts and risks identified by the specialists as listed above, were included in this BAR and all mitigation measures were incorporated into the EMPr attached as Part B.

- Public Participation:

- All directly and adjacently affected landowners were involved in the public participation process, and all comments received from landowners, stakeholders, commenting authorities and I&APs were included in the BAR and assessed in the impact assessment.
- Landowner consultations were conducted as part of the Socio-economic assessment and concerns raised were included in the impact assessment section of this BAR.;
- Alternative BP sites proposed by landowners.

i) Assessment of each identified potentially significant impact and risk

Table 11: Impact Assessment

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
<p>Construction and operation of the borrow pit.</p> <ul style="list-style-type: none"> features such as fencing, access arrangements, aggregate stockpiles, topsoil stockpiles, container stores, crushing and screening area, office and support facilities, haul roads, overburden placement, etc.; Understand site drainage and manage stormwater (e.g. construct sediment holding 	Land Use	Land acquisition and servitude restrictions	Construction Operation and closure	Low (-)	<ol style="list-style-type: none"> 1. Compensation to be determined by an independent evaluator, in accordance with the principle set out in Section 25 of the Constitution concurrent with Section 12 of the Expropriation Act 63 of 1975; and 2. Optimisation of borrow pit location to be considered in the design phase to avoid existing structures and buildings, as well as other sensitive features i.e. Minor roads are visible, access roads are visible, power line is visible outside the pipeline route and farm assets are visible. 	Low (-)
		Disruptions and alterations to existing land use and services	Construction Operation and closure	Medium	<ol style="list-style-type: none"> 1. Construction and mining of borrow pit will only commence following completion of land acquisition process. 2. Demarcation and fencing of borrow pit and associated haul roads. 3. The footprint of the construction site camp must be kept to a minimum. 4. Clearly demarcate the workable site and ensure that the demarcated area is only that which is necessary for mining. 5. Ensure personnel are aware of prohibited actions and “no-go” areas by means of monthly toolbox talks. 6. Ensure that the contractor has a copy of the EMPr onsite at all times. 7. The contractor personnel must be made aware of the location of the existing services on the property i.e. Minor roads are visible, access roads are visible, power line is visible outside the pipeline route and farm assets are visible. 8. Land disturbed or altered shall be rehabilitated. 	Low (-)

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
basins and divert up-slope water around the mining area); <ul style="list-style-type: none"> • Construction of access and haul roads; • Site preparation, including clearing and grubbing; • Remove and safe storage (temporary stockpiles) of topsoil and remaining 					<ol style="list-style-type: none"> 9. Rehabilitation of the borrow pit and haul roads must be undertaken as specified in the EMPr. 10. If there is a risk of damage taking place on a property as a result of construction and mining activities, a condition survey should be undertaken prior to construction and record maintained. 11. The contractor is to make good and acknowledge any damage that occurs on any property as a result of construction and mining work. 12. Where agricultural machinery are damaged, compensation is to be paid to the farmer for the loss of these crops, subject to evaluation of the claim. 13. The farmer should be compensated for any loss of income experienced at the account of the contractor and this is subject to evaluation of the claim and approval. 14. Provide a channel such as a complaints register through which communities can route grievances or concerns regarding service disruption as a result of the project. 	

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
overburden material for post-mining rehabilitation; <ul style="list-style-type: none"> Manage borrow pits, including side slopes and floor of mined area; Process the borrowed material (crushing and screening) for use in earthworks; 	Climate	Greenhouse gas emissions. Contributions to global warming.	Construction Operation and closure	Low (-)	<ol style="list-style-type: none"> Materials with a high recycled content should be used where possible and the re-use of site materials should be considered. The operational performance of site offices and storage facilities on site should be considered so to maximise the efficient use of energy and water. Training should be provided to operators to ensure that they maximise the efficiency of the plant and idling is reduced. In terms of transportation of workers and staff, collective transportation arrangements should be made to reduce individual car journeys. All vehicles used during the project should be properly maintained and in good working order. 	Low (-)
<ul style="list-style-type: none"> Load the borrow material into tipper trucks and haul material to pipeline trench, as well as other areas where the material is required; Inert and spoil material to be used to old fill borrow area (as necessary); 	Soils	Soil erosion and contamination	Construction Operation and closure	Medium (-)	<ol style="list-style-type: none"> Contractors must limit vegetation clearing to the demarcated workable corridor/site as per the approved layout for the borrow pit. Stabilisation of cleared areas to prevent and control erosion. The method chosen (e.g. watering, planting, retaining structures, commercial anti-erosion compounds) will be selected according to the site-specific conditions. Drainage management should also be implemented to ensure the minimization of potential erosion. Excavated materials should not be contaminated, and it should be ensured that the minimum surface area is taken up. Mixture of the lower and upper layers of the excavated soil should be kept to a minimum, for later usage as backfill material or as part of rehabilitation activities. Topsoil shall be removed from all areas where physical disturbance of the surface will occur and shall be stored and protected. 	Low (-)

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
<p>Closure of borrow pits:</p> <ul style="list-style-type: none"> • Grading of site; • Removal of all facilities associated with mining activities; and • Stabilise, reinstate and rehabilitate borrow areas. <p>The mining equipment to be used includes the following:</p> <ul style="list-style-type: none"> • Excavators • Bull-dozers, front-end loaders, backactors; • Tipper trucks; • Graders • Water trucks; and • Lowbed truck • (Transporting machines on and off site). 					<ol style="list-style-type: none"> 5. The use of the already disturbed areas should be encouraged. 6. Erosion control measures including silt fences, low soil berms and/or shutter boards must be put in place around the stockpiles to limit sediment runoff from stockpiles. 7. Construction vehicles must remain within the allocated routes as to avoid the compaction of soils and inhibition of plant growth. 8. Daily monitoring to be conducted to detect erosion (e.g. management areas, stockpiles, and mining areas). 9. All hydrocarbons (e.g. fuel, oils and contaminated soil/materials) and other hazardous waste resulting from spills, refuelling and maintenance activities shall be disposed of in a formally licensed hazardous waste site or, where possible, be removed and disposed by an approved contractor. The Contractor shall provide Safe Disposal Slips issued by the hazardous waste disposal facility. The Safe Disposal Slips shall be on site at all time. 10. Used oil, lubricants, cleaning materials, etc. from the maintenance of vehicles and machinery may be collected in holding tanks prior to disposal. 11. Topsoil shall only be handled during removal and reinstatement. 12. At least 95% of recovered topsoil from disturbed areas is to be stored for future use. 13. There must be no visual evidence of erosion from topsoil stockpiles. 14. No visual evidence of erosion from areas where topsoil has been reinstated. Soil horizons (e.g. topsoil, subsoil, bedrock etc.) to be kept separate during removal, stockpiling and reinstatement. 	

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
					15. All soils shall be reinstated in the reverse order to that in which they have been removed.	
	Geohydrology	<p>Contamination of groundwater by poor mining practices: Hydrocarbon / hazardous material / effluent spills in the servitude, excavation and borrow pit working areas;</p> <p>Poor waste management and storage resulting in seepage of contaminants to the Groundwater;</p> <p>Removal of soils and topsoil leaving the groundwater vulnerable to potential surface contamination;</p>	Construction Operation and closure	Medium (-)	<ol style="list-style-type: none"> 1. Provide monthly environmental awareness training for construction water management and water saving practices to be implemented (i.e. to limit abstraction requirements for domestic purposes at the construction camps during the construction and mining phases). 2. Investigate claims or complaints from surrounding groundwater users and implement any corrective measures recommended as an outcome of the investigation. 3. Notify surrounding groundwater users of contamination / hydrocarbon spills where water supply boreholes are at risk of being contaminated. 4. Ensure spill kits are available to manage any hydrocarbon spills during site establishment until dedicated vehicle maintenance areas are defined. Spill kits must remain available during the construction progress. 5. Transport and store hazardous material according to their specific Material Safety Data Sheets (MSDS), protect from direct rainfall and prevent run-off from these areas. 6. Storage facilities for hazardous material must be bunded with impermeable surfaces. The bund must have a net capacity equal to that of the storage tank plus an additional 10% of the tank capacity (SANS 10131: 2004). 7. Prevent hydrocarbon spills within the project servitude, excavations and borrow pits by maintaining vehicles and the use of dip trays. Leaking equipment must be repaired immediately or removed from site. 	Low (-)

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
					<p>8. Any hydrocarbon spills need to be cleaned up immediately and the contaminated material disposed of at an appropriate licenced facility.</p> <p>9. If there is a significant hydrocarbon spill, boreholes within 100m radius must be sampled immediately for the full range of organic parameters. Sampling of organic parameters must continue on a monthly basis thereafter until the results are undetectable. If organic parameters remain undetectable after the spill, sampling must continue for a year to confirm no negative impacts were caused to the borehole. If a complaint or issue is raised thereafter sampling for organic parameters will need to resume until the results are undetectable and investigate if hydrocarbon spill was adequately rehabilitated.</p> <p>10. Locate infrastructure in areas where sensitive environmental features will not be impacted on (i.e. not within 100m of a water body), unless authorisation to do so has been granted.</p> <p>11. Locate all storage and laydown areas within predetermined footprints as per the approved site plan.</p> <p>12. Manage storm water from any construction camps to limit seepage of contaminated water from dirty water areas (i.e. from workshop and fuel storage areas) to aquifers.</p> <p>13. Storm water runoff from workshops, vehicle maintenance area, wash-bay and other potential pollution sources shall be collected and treated in hydrocarbon separation pits / tanks before discharge to drains and waterways.</p> <p>14. No pit latrines, French drain or soak away systems are allowed.</p>	

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
					<ul style="list-style-type: none"> 15. Toilets must not be positioned within 100m of a water supply borehole. 16. All toilets must be serviced according to standard protocol by a waste management service provider (contractor) to prevent spillages and overflows. 17. The waste management service provider (contractor) must ensure that no spillages occur when the toilets are serviced (cleaned and emptied) and that waste is transported in an appropriate manner until disposed at a waste disposal or treatment facility designed to handle the waste. 18. Portable (temporary / mobile) toilets must be secured to prevent them falling over. 19. Discharge water from showers and washing facilities must be managed to prevent seepage to the groundwater. 20. Construction and mining activities must remain within the designated servitudes to minimise disturbance of overburden. 21. Keep the disturbance footprint to within the designed infrastructure specifications in areas underlain by the sensitive dolomitic and alluvial aquifers. 22. Vehicles to be in good working order to avoid leaks. 23. Where vehicles/machinery are leaking oil, fuel drip trays must be used to contain the spill. All vehicles and machinery must be repaired as soon as possible. 	
	Topography	Erosion on steep slopes and alteration of the natural gradient	Construction Operation and closure	High (-)	<ul style="list-style-type: none"> 1. Changes in natural gradients due to mining activities should be avoided where possible or mitigated by levelling the slope to the original gradient. 2. Where the above is not possible, exposed slopes steeper than 1:5 (vertical: horizontal) should be hydro seeded with a suitable grass seed mix within a week of their exposure. 	Low (-)

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
					<ol style="list-style-type: none"> 3. Long-term stockpiles should be hydro seeded with a suitable grass seed mix within a week of their establishment. 4. A 50% grass cover should be achieved within 1 month of the onset of the next growing season following hydro seeding and 75% cover within 2 months thereafter. A minimum of 75% grass cover should be maintained until rehabilitation of the slope or stockpile area is initiated. 5. Stockpiling of material will be confined to one designated area as per the layout plan in Figure 2. 6. All residue deposits will be removed and the borrow areas will be reshaped to blend in with the surrounding topography. 7. Unused overburden / spoil material shall be placed back into the excavation and reshaped, where possible, to blend into the surrounding landscape. 8. The stockpiled topsoil will be spread over the site. Manually rip the ground surface in all areas affected by compaction to a depth of 150 mm prior to the application of topsoil. 9. Thoroughly till the subsoil to a depth of at least 100 mm by means of a plough, disc, or harrow. 10. Spread topsoil evenly over ripped or tilted surface to a depth of 150 mm. 11. Ensure the final prepared topsoil surface is furrowed to follow the natural topography. 12. Cover topsoil with a biodegradable geotextile (erosion control blanket). 13. Extend the geotextile beyond the edge to be covered, burying the top end and secure with biodegradable stakes. 	
				High (-)	<ol style="list-style-type: none"> 1. NFA Protected trees within this Borrow Pit includes <i>Combretum imberbe</i> (Leadwood), <i>Sclerocarya birrea subsp. caffra</i> (Marula) and 	Low (-)

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
	Flora	Loss of plant species of conservation concern	Construction Operation and closure		<p><i>Vachellia erioloba</i> (Camel thorn). The destruction or disturbance of protected species within this habitat unit i.e. NFA protected species, must be avoided. If this is not possible, the rescue and relocation of these species must be pursued. Thus, if the proposed layout is authorised, it will be necessary to conduct a thorough walk down of the footprint areas, including at least a 10m buffer around the footprint area, where all protected floral species are marked for relocation to suitable habitat outside the direct footprint (as far as is feasible). The protected species walk down must be conducted during the flowering season of the species to ensure adequate detection and identification of the species – November to March will be ideal for this area. Record-keeping will be necessary to record this process and to document all successes and failures associated with the relocation.</p> <ol style="list-style-type: none"> 2. Relevant permit applications and authorisations from LEDET and DFFE must be obtained prior to any activities commencing that will impact these protected species. 3. Any unauthorised collection of floral material is to be prohibited. 4. Monitoring of any rescued and relocated floral SCC should commence during the construction phase and continue until it is evident that relocated species have successfully established. 5. Harvesting of protected floral species by construction and operational personnel should be strictly prohibited. 6. Edge effect control needs to be implemented to prevent further degradation and potential loss of floral SCC outside of the proposed development footprint area. 	

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
		Destruction of indigenous flora during site establishment	Construction Operation and closure	Medium (-)	<ol style="list-style-type: none"> 1. Approximately 7.47 Ha of Dwaalboom Thornveld habitat will be removed for Borrow Pit D. 2. No additional habitat is to be disturbed during the operational phase of the project outside of the demarcated approved footprints (being applied for). Biweekly (recommended) to monthly (minimum requirement) monitoring and recording of the footprint areas must be done by the Environmental Control Officer (ECO) and photographic records kept – special attention should also be paid to potential increase and spread of alien vegetation and bush encroachment. 3. Vehicles should be restricted to travelling only on designated roadways to limit the ecological footprint of the construction activities. Additional road construction should be limited to what is absolutely necessary, and the footprint thereof kept to a minimal. 4. No collection of indigenous floral species must be allowed by construction personnel, especially with regards to floral SCC. 5. No dumping of litter, rubble or cleared vegetation on site must be allowed. Infrastructure and rubble removed as a result of the construction activities should be disposed of at an appropriate registered dump site away from the development footprint. No temporary dump sites should be allowed in areas with natural vegetation. Waste disposal containers and bins should be provided during the construction phase for all construction rubble and general waste. Vegetation cuttings must be carefully collected and disposed of at a separate waste facility. 6. Clearly demarcate the construction and mining servitude. 	Low (-)

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
					<ol style="list-style-type: none"> 7. Vegetation clearing should be kept to a minimum (restricted to construction servitude), and this should only occur where it is absolutely necessary. 8. Ensure that all personnel have been trained to establish environmental awareness and competence. 9. Vehicles and construction workers should under no circumstances be allowed outside the construction servitude to prevent impact on the surrounding vegetation. 10. Prevent contamination of natural areas. 11. Areas cleared of vegetation must be re-vegetated prior to contractor leaving the site. 12. Proliferation of alien and invasive species is expected within the disturbed areas and they should be eradicated and controlled to prevent further spread. 13. No storage of any construction material within sensitive areas. 14. Avoid translocating stockpiles of topsoil from one place to sensitive areas in order to avoid translocating soil seed banks of alien species. 15. To limit edge effect impacts to the surrounding natural habitat, the below guidelines must be followed: <ul style="list-style-type: none"> • Demarcating all footprint areas during construction activities; • No construction rubble to be disposed of outside of demarcated areas, and should be taken to a registered waste disposal facility; • All soils compacted as a result of construction activities should be ripped, profiled and reseeded; • Suppress dust to mitigate the impact of dust on flora within a close proximity of construction activities; 	

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
					<ul style="list-style-type: none"> • Minimise the risk of erosion by limiting the extent of disturbed vegetation and exposed soil; and • Manage the spread of AIP species and bush encroachers, which may affect remaining natural habitat within surrounding areas. <p>16. Ongoing alien and invasive plant monitoring and clearing/control should take place throughout all phases of the project activities. The project perimeters should regularly be checked for AIP proliferation to prevent spread into surrounding natural areas.</p> <p>17. AIPs were not a significant problem on site during the 2021 field assessment; however, with construction activities there is always a risk of AIPs being introduced which then tend to proliferate in disturbed areas.</p> <p>18. Their management during the construction-phase and operational-phase activities must be focused on limiting their introduction and preventing their spread. For example, roadsides should be monitored, as they serve as common corridors along which AIP species are introduced and dispersed, and disturbed areas should regularly be monitored for AIP recruitment until successfully rehabilitated.</p> <p>19. If, at any stage, the ECO or Environmental Manager notices an increase in alien vegetation, it is recommended that an AIP Management and Control Plan be ready for implementation.</p> <p>20. Rehabilitation of natural vegetation should proceed in accordance with the rehabilitation plan – concurrent rehabilitation is recommended. This rehabilitation plan should consider all phases of the project indicating rehabilitation actions to be undertaken during and once construction has been completed, ongoing rehabilitation</p>	

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
					<p>during the operational phase of the project as well as rehabilitation actions to be undertaken after operations have ceased.</p> <p>21. Shaping of disturbed areas is essential. To promote successful establishment of vegetation, the slopes must not be steeper than 1(V):5(H). New slopes should resemble/mimic the natural topography of the surrounding area. Where slopes are left steeper than the recommended 1(V):5(H) for whatever reason, a stormwater management plan will be required to prevent soil erosion and to manage stormwater.</p> <p>22. Any natural areas beyond the direct footprint, which have been affected by the construction or operational activities, must be rehabilitated using indigenous species.</p> <p>23. Rehabilitation must be implemented concurrently as per the rehabilitation plan, and disturbed areas must be rehabilitated as soon as such areas become available. This will not only reduce the total disturbance footprint but will also reduce the overall rehabilitation effort and costs associated with it.</p> <p>24. All soils compacted because of construction activities falling outside of the project area should be ripped and profiled. Special attention should be paid to alien and invasive control within these areas.</p>	
		Loss of vegetation due to fuel and chemical spills.	Construction Operation and closure	Medium (-)	<p>1. Make sure construction vehicles are maintained and serviced to prevent oil and fuel leaks.</p> <p>2. Emergency on-site maintenance should be done over drip trays and all oil or fuel must be disposed of according to waste regulations. Drip-trays must be placed under vehicles and equipment when not in use.</p> <p>3. If any spills occur, they should be cleaned up immediately to avoid soil contamination that</p>	Low (-)

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
					can hinder floral rehabilitation later down the line. Spill kits should be kept on-site within workshops. In the event of a breakdown, maintenance of vehicles must take place with care, and the recollection of spillage should be practised, preventing the ingress of hydrocarbons into the topsoil.	
		Management of alien invasive species	Construction Operation and closure	Medium (-)	<ol style="list-style-type: none"> 1. Control of alien invasive species and noxious weeds for disturbed areas, in accordance with the requirements of the Conservation of Agricultural Resources Act, No. 43 of 1983 and GN No. R. 598 (Alien and Invasive Species Regulations, 2014) in terms of NEM:BA. 2. Chemical control of alien vegetation must be avoided; however, if absolutely deemed necessary, only certified chemicals to be used by trained personnel. 3. To prevent unnecessary alien plant infestations, an alien plant monitoring and eradication programme needs to be in place, at least until the disturbed areas have recovered and properly stabilised. 4. Ongoing alien plant control must be undertaken after the construction phase and during the operational phase and particularly in the disturbed areas. This must be controlled through the EMPr. 5. Monitor all sites disturbed by construction activities for colonisation by exotics or invasive plants and control these as they emerge. 6. Areas cleared of alien invasive plants must be rehabilitated with indigenous plant species. 	Low (-)
		Loss of topsoil and erosion.	Construction and Operational	Medium (-)	<ol style="list-style-type: none"> 1. During site preparation, topsoil and subsoil are to be stripped separately from each other and must be stored separately from spoil material for use in the rehabilitation phase. It should be protected from wind and rain, as 	Low (-)

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
					<p>well as contamination from diesel, concrete or wastewater.</p> <p>2. An ecologically-sound storm water management plan must be implemented during construction and water diversion systems put in place.</p>	
		Rehabilitation of site after construction.	Operation & Closure	Medium (-)	<p>1. Rehabilitation of natural vegetation should proceed in accordance with the rehabilitation plan –concurrent rehabilitation is recommended. This rehabilitation plan should consider all phases of the project indicating rehabilitation actions to be undertaken during and once construction has been completed, ongoing rehabilitation during the operational phase of the project as well as rehabilitation actions to be undertaken after operations have ceased.</p> <p>2. Shaping of disturbed areas is essential. To promote successful establishment of vegetation, the slopes must not be steeper than 1(V):5(H). New slopes should resemble/mimic the natural topography of the surrounding area. Where slopes are left steeper than the recommended 1(V):5(H) for whatever reason, a stormwater management plan will be required to prevent soil erosion and to manage stormwater.</p> <p>3. Any natural areas beyond the direct footprint, which have been affected by the construction or operational activities, must be rehabilitated using indigenous species.</p> <p>4. Rehabilitation must be implemented concurrently as per the rehabilitation plan, and disturbed areas must be rehabilitated as soon as such areas become available. This will not only reduce the total disturbance footprint but will also reduce the overall rehabilitation effort and costs associated with it.</p>	Low (-)

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
					5. All soils compacted because of construction activities falling outside of the project area should be ripped and profiled. Special attention should be paid to alien and invasive control within these areas. 6. Monitoring of rescued and relocated floral SCC should continue during the Decommissioning and Rehabilitation Phase until it is evident that the species have successfully established. Where possible, these species should be reintroduced into rehabilitation sites.	
	Fauna	Loss of Protected species listed in terms of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) Threatened or Protected Species regulations	Construction Operation and closure	Medium (-)	1. No threatened species were recorded in this habitat however <i>Python natalensis</i> (Southern African Python) may forage within the borrow pit periodically. - Habitat is encroached with poor grazing material available, limiting suitable food resources for herbivores. 2. The ECO is to ensure that a visual list of species is made available to the contractor and site personnel. 3. As operation proceeds, a concerted effort must be made to ensure that any animals encountered should be released in nearby suitable habitat. 4. If species of importance are encountered during operation, the relocation must be per the faunal specialist recommendations and upon guidance from the ECO.	Low (-)
		Loss of habitat and displacement of animals on site.	Construction Operation and closure	Medium (-)	1. If any herpetological species be encountered or exposed during the construction phase, they should be removed and relocated to natural areas in the vicinity. This remedial action requires the employment of a herpetologist and or ecologist to oversee the removal of any herpetofauna during the initial ground clearing phase of construction (i.e. initial ground-breaking by earthmoving equipment).	Low (-)

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
					<ol style="list-style-type: none"> 2. Vertebrate habitat beyond the demarcated area should not be altered, cleared, or impacted upon in any manner or form. 3. Vegetation clearance should take place in a phased manner, starting from one side of the borrow pit and working towards the other side so as to allow species to naturally relocate out of the footprint area. Where such relocation does not occur naturally, the rescue and relocation plan should be consulted. Failing this a suitably qualified specialist should be consulted should the species encountered not be covered under the rescue and relocation plan. 4. No hunting or trapping/snaring is allowed by staff. Any individuals caught should be fined accordingly within the company structure. Repeat offenders are to be charged according to LEMA and NEMA where applicable. 5. No collecting of small reptile species for the pet trade is to be tolerated. Individuals caught must be reported to the authorities immediately and charged accordingly. 6. Consideration should be given to worker contract amendments, stating that offenders will be charged and will face dismissal should they be caught. 7. No dumping of litter, rubble or cleared vegetation (especially AIP) should happen outside of the designated borrow pit footprint; 8. No illicit fires must be allowed by staff on site during the construction or operational phase of the project. 9. Excavated topsoil must be stored with associated native vegetation debris for subsequent use in rehabilitation. 10. An AIP control plan must be developed and must include ongoing alien and invasive plant monitoring and clearing/control. 	

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
					<ol style="list-style-type: none"> 11. Edge effect control needs to be implemented to ensure no further degradation and potential loss of habitat outside of the proposed borrow pit footprint areas occurs. 12. Each operational team should have an equipped and trained staff member amongst them who will be able to handle and remove any snakes found on site. 13. Smaller species such as amphibians and reptiles are likely to be less mobile during the colder periods of the year, as such should any be observed in the footprint sites during clearing and operational activities, they are to be carefully and safely moved to an area of similar habitat outside of the disturbance footprint as per the rescue and relocation plan. Construction personnel are to be educated about these species and the need for their conservation. Smaller scorpion species and harmless reptiles should be carefully relocated by a suitably nominated construction person or staff member. 	
	Socio-Economic: Health and well being	<ul style="list-style-type: none"> • Dust, noise, blasting and other emissions • Waste • Security • Personal Safety 	Construction Operation and closure	Medium (-)	<p>Dust and other emissions</p> <ol style="list-style-type: none"> 1. Dust suppression measures or temporary stabilising mechanisms to be used when dust generation is unavoidable (e.g. dampening with water, chemical soil binders, straw, brush packs, chipping), particularly during prolonged periods of dry weather. Dust suppression to be undertaken for all bare areas, including construction area, access roads, borrow pits, site yard, etc. 2. Note that all dust suppression requirements should be based on the results from the dust monitoring and the proximity of construction activities to sensitive receptors. 3. The Contractor will take preventative measures to minimise complaints regarding dust (e.g. screening, dust control, timing, pre-notification of affected parties). 	Low (-)

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
					<p>4. Concentrated flows from dust suppression must be avoided and remediated.</p> <p>5. Operators will be trained on best techniques (induction and toolbox talks) to handle materials in a manner that reduces dust generation such as reducing drop heights.</p> <p>6. Material transporting vehicles will not be overloaded.</p> <p>7. Ensure minimum travel distance between working areas and stockpiles, where possible.</p> <p>8. Stockpiling activities will be restricted during high wind</p> <p>9. Minimise travel speed on unpaved roads (20 km/h) and 35km/hr on paved roads</p> <p>10. Maintain access roads in order limit exposed dust generating areas.</p> <p>11. All exposed surfaces must be minimised in terms of duration of exposure to wind through implementing concurrent rehabilitation.</p> <p>12. Wet suppression on all unpaved roads.</p> <p>13.</p> <p>Noise</p> <p>14. Awareness by means of training and toolbox talks regarding speed limits onsite and offsite to reduce noise to a minimum.</p> <p>15. Awareness training in the operation of trucks and other vehicles to minimise noise emissions. This includes speed of vehicles on unpaved roads (20km/hr) and paved roads (35km/hr), times of operation; heavy haulage (aggregate and fuel supplies as well as dispatch of aggregate) should be prevented during morning and late afternoon peak traffic hours (07:00-09:00 and 16:00-18:00) to prevent noise during these times which can cause disturbance.</p> <p>16. Prior notice should be given to surrounding communities of blasting events.</p>	

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
					<p>17. Development of a blast management plan in order to comply with blasting-related legislation and standards.</p> <p>18. The Contractor shall employ industry standard methods to control the impact of blasting and limit the risk of damage to buildings and structures by reducing blast vibrations induces in the rock mass, eliminating fly rock and limiting air blast and noise to acceptable levels in line with the Norms and Standards for blasting..</p> <p>19. Blasting shall be conducted during daylight hours on regular Business Days only and shall not be conducted on weekends or Holidays unless prior approval has been obtained.</p> <p>20. No sirens should be used at the screening/processing plants, other than for emergency purposes.</p> <p>21. The remote nature of the construction domain needs to be factored in to the mitigation of noise-related aspects.</p> <p>22. The provisions of SANS 10103:2008 will apply to all areas at the perimeter of the site, within audible distance of residents. Noise shall be monitored at the nearest sensitive receptor and where the noise is generated following a validnois complaint (receptor within 100m).</p> <p>23. Construction work should take place during working hours – defined as 06:00-17:00 from Monday to Saturday no work on Sundays. Should overtime work be required, that will generate noise, consultation with the affected community or landowner should take place.</p> <p>24. No amplified music will be allowed on the site. The use of radios, tape recorders, compact disc players, television sets etc. will not be permitted unless at a level that does</p>	

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
					<p>not serve as an intrusion to adjacent land-owners.</p> <p>25. The Contractor will take preventative measures (e.g. screening, muffling, timing, pre-notification of affected parties) to minimise complaints regarding noise and vibration nuisances from sources such as power tools.</p> <p>26. Proper design and maintenance of silencers on diesel-powered equipment, systematic maintenance of all forms of equipment, training of personnel to adhere to operational procedures that reduce the occurrence and magnitude of individual noisy.</p> <p>Waste</p> <p>27. Waste management activities must comply with the NEM:WA. Classification of types of waste must be referred to GN 634 of 2013.</p> <p>28. The storage of general or hazardous waste in a waste storage facility must comply with the norms and standards in GN No. R. 926 of 29 November 2013.</p> <p>29. Vermin / weatherproof bins shall be provided in sufficient numbers and capacity to store domestic waste, this will be upon the approval of the ECO. These bins must be kept closed to reduce odour build-up and emptied when full to avoid overfilling.</p> <p>30. Waste must be separated at source (e.g. containers for glass, paper, metals, plastics, organic waste and hazardous wastes).</p> <p>31. Establish and monitor recycling targets.</p> <p>32. Following the mining activities and in preparation for closure, all construction materials, rubble, waste and litter must be removed from the site.</p> <p>33. Ensure good housekeeping is practised.</p>	

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
					<p>34. The Contractor shall ensure that no burying, dumping or burning of waste materials, vegetation, litter or refuse occurs. All waste will be disposed of at suitable licensed disposal sites, based on the waste type (general versus hazardous).</p> <p>35. Ensure that waste is transported so as to avoid waste spills en-route.</p> <p>36. Separate disposal sites for hazardous waste. This must be on a bunded area compliant to hazardous waste disposal regulations.</p> <p>Hazardous Materials</p> <p>37. Hazardous materials must be stored and handled in accordance with the appropriate legislation and standards, which include the Hazardous Substances Act (Act No. 15 of 1973), the Occupational Health and Safety Act (No. 85 of 1993), relevant associated Regulations, and applicable SANS and international standards.</p> <p>38. Storage and use of hazardous materials will be strictly controlled to prevent environmental contamination, and must adhere to the requirements stipulated on the SDS.</p> <p>39. Signage to be displayed at storage areas for hazardous substances.</p> <p>40. Where flammable liquids are being used, applied or stored the workplace must be ventilated.</p> <p>41. No person may smoke in any place in which flammable liquid is used or stored.</p> <p>42. Install fire-fighting equipment around the flammable liquids store.</p> <p>43. Where flammable liquids are decanted, the metal containers must be bonded or earthed.</p> <p>44. No flammable material (e.g. paper, cleaning rags or similar material) may be stored together with flammable liquids.</p>	

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
					<p>45. Staff that will be handling hazardous materials must be trained to do so.</p> <p>46. Any hazardous materials (apart from fuel) must be stored within a lockable store with a sealed floor. Suitable ventilation to be provided. A lined sump and tap of area must be included in all these areas.</p> <p>47. All storage tanks containing hazardous materials must be placed in bunded containment areas with impermeable surfaces. The bunded area must be able to contain 110% of the total volume of the stored hazardous material. . A bermed drainage area must be included to facilitate the removal of accumulated water.</p> <p>48. SDSs, which contain the necessary information pertaining to a specific hazardous substance, must be present for all hazardous materials stored on the site.</p> <p>49. Spill kits must be available for the cleanup of hazardous material spillages. This includes all vehicles used on site.</p> <p>50. Provide secondary containment where a risk of spillage exists.</p> <p>51. Drip trays to be placed under all parked heavy vehicles, equipment and other receptacles of hazardous material to prevent spillages.</p> <p>52. In the event of spillages of hazardous substances the appropriate clean up and disposal measures are to be implemented. Adequate spill-kits should be readily available.</p> <p>53. Spill reporting procedures to be displayed at all locations where hazardous substances are being stored. Toolbox talks on the procedure refreshed frequently by ECO. Hazardous materials will be disposed of at registered sites or handed to registered hazardous waste disposal facilities for</p>	

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
					<p>disposal/recycling. Proof of adequate disposal required.</p> <p>Security and Safety</p> <p>54. Involve the local Community Policing Forums and other security associations.</p> <p>55. Develop a security risk assessment and emergency response plan.</p> <p>56. Ensure compliance with landowner biosecurity protocols in relation to the construction of the pipeline on the related properties.</p> <p>57. Ensure suitable management of the labour force to prevent security-related issues or disturbance to landowners and community members.</p> <p>58. A security policy shall be developed which amongst others requires that permission be obtained prior to entering any property and provisions controlling trespassing by contractor staff.</p> <p>59. Only security staff shall be allowed to reside at contractor camps. General labour is expected to reside at approved accommodation or compounds.</p> <p>60. The camp sites for the project and the non-longitudinal construction sub-site components should be fenced for the duration of construction.</p> <p>61. Contractors should establish crime awareness programmes at their site camps.</p> <p>62. Ensure that, at all times, people have access to their properties as well as to social facilities such as schools, churches, transport, shops, etc. made prior to the construction work commencing.</p> <p>63. Finger printing all employees (including foreign nationals) to create a database.</p>	

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					<p>64. All employees are to be vetted (police clearance checks).</p> <p>65. Limited use of cell phones within the servitude.</p> <p>66. Erect a partition along the servitude where there may be visual exposure to landowner property or game (for privacy purposes as well).</p> <p>67. Colour coding diesel and petrol for ease of retrieval if stolen.</p> <p>68. Create serial numbers for equipment for ease of retrieval if stolen.</p> <p>69. Establish and maintain an asset register.</p> <p>70. Have a chemical spill kit on site.</p> <p>71. Develop a veld fire-fighting response plan and veld fire-fighting training.</p> <p>72. Ensure that employees wear the correct personal protective equipment (PPE) at all time to mitigate for the risk of snake and spider bites as well as exposure to the elements (heat and lightning). Anti-venom should be kept on site in case of snake bites.</p> <p>73. Ensure that contractors pay employees on time and comparative wages to mitigate for labour unrest.</p> <p>74. Ensure that there is security on site at all times and employ a reputable security company that is PSIRA accredited which also has a good working relationship with SAPS. It is also important that the security company search all employees to mitigate for theft by workers.</p> <p>75. Landowners have urged very strongly that the Project should incorporate the landowners' security systems, equipment and staff that they already have in place.</p> <p>76. Servitude fences should be high enough to prevent wild and dangerous animals from climbing over into the servitude or to prevent game from escaping.</p>	

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					<p>77. The security measures that the MCWAP-2 puts in place should complement the security efforts that the farming community already has in place.</p> <p>78. The project should provide safe working conditions by providing PPE, transport, accommodation and on-site security.</p> <p>79. Landowners would like no cell phones allowed on site for the following reasons:</p> <ul style="list-style-type: none"> • To prevent workers from sharing the locations of rhinos sightings with poachers. This is mainly applicable in situations where the owner's property is within close proximity to the servitude. • To prevent workers from taking pictures of valuable assets so that they can return to certain properties after the Project has concluded to steal from landowners. They fear that workers will over time gather enough knowledge of what is on the farms to return and steal. <p>80. Avoid political interference at all costs. Respondents recommended that TCTA should take responsibility for all information and communication on the project as well as to take all the credit for the project.</p> <p>81. Hire locally as far as possible.</p> <p>82. Foster a sense of ownership for the project. It is believed that if communities have this sense of ownership, they will protect the project assets and infrastructure.</p> <p>83. Develop a safety and security management plan.</p>	
	Socio-Economic: Quality of the living environment	<ul style="list-style-type: none"> • Disruptions of daily living; • Damage to property 	Construction Operation and closure	Medium (-)	<ol style="list-style-type: none"> 1. Heavy haulage (aggregate and fuel supplies as well as dispatch of aggregate) should be prevented during morning and late afternoon peak traffic hours (07:00-09:00 and 16:00-18:00). 2. The contractor must ensure that access to the various work sites and associated 	Low (-)

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					<p>infrastructure and equipment is off limits to the public at all times during operation.</p> <ol style="list-style-type: none"> 3. Additional areas restricted to the public and suggested detours must be clearly marked on information boards to the satisfaction of the ECO. 4. Any access to site that may pose a danger to the public must have signage warning of such danger. 5. Ensure that, at all times, people have access to their properties as well as to social facilities such as schools, churches, transport, shops, etc. 6. Investigate and consult farmers and local communities on the need to provide access points around the construction sites for people and animals. 7. Only roads and tracks allocated as access roads must be used (no informal tracks or roads to be created). 8. The contractor must control the movement of all vehicles and plant (including that of his suppliers) so that they remain on designated routes, are distributed so as not to cause an undue concentration of traffic, and that all relevant laws are complied with. 9. An access survey should be carried out prior to working in a new section of the project and access arrangements should be discussed and agreed to by the landowner. 10. If a risk existing of damage taking place on a property as a result of construction, a condition survey should be undertaken prior to construction. 11. The contractor is to make good and acknowledge any damage that occurs on any property as a result of construction work. 	
	Socio-Economic:	<ul style="list-style-type: none"> • Growing informal settlement 	Construction Operation and closure	Medium (-)	1. Provide/facilitate housing for all construction employees, which would include contractors' camps.	Low (-)

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
	Construction projects have in the past resulted in an influx of job-seekers seeking employment on these projects.	<ul style="list-style-type: none"> • Competition for scarce jobs • Pressure on physical and social infrastructure • Risk of increased vulnerability of youth and women 			<ol style="list-style-type: none"> 2. Work with the LMs to develop an influx management plan to plan for the expected growth and to support the LM to mitigate for risks associated with the influx of job-seekers. 3. Facilitate social monitoring for tension between community groups. 4. Develop a contractor management plan that has a code of conduct for employees. 	
	Socio-Economic: Construction projects have in the past resulted in an influx of job-seekers seeking employment on these projects.	<ul style="list-style-type: none"> • Attract talent and skills • Increase local spending • Increase cultural diversity, which builds tolerance 	Construction Operation and closure	Medium (+)	N/A	Medium (+)
	Socio-Economic: SA legal systems require that the local government elections take place Stakeholders have noted	<ul style="list-style-type: none"> • Instability caused by Municipal local elections • Electioneering creating high expectations for the project • Politicians creating 	Construction Operation and closure	Medium (-)	<ol style="list-style-type: none"> 1. Avoid major construction works before, during and just after the election period. 2. Develop one official channel of communication for the public to access accurate information and get their questions answered. 3. Address misinformation and rumours about the Project and its associated recruitment and procurement processes. 4. Avoid affiliation with political parties but engage officials and politicians through the official channel to ensure they have the correct project information. 5. Recruit a communication specialist to support the project's communication needs, e.g., 	Low (-)

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
	that political figures are providing information about the Project in order to win support of their constituencies.	<p>high expectations of the Project and creating confusion amongst communities.</p> <ul style="list-style-type: none"> • Politicians may use the misinformation and confusion to their own advantage and gain community support for themselves 			develop key messages, setup social media platforms, branding.	
	Socio-Economic: Stakeholders noted reports of xenophobia, racism, discrimination (gender) and community mistrust in local government (allegations of corruption), as the precedent on mega projects.	<ul style="list-style-type: none"> • Community frustration with local government and high unemployment may spill over to MCWAP-2, leading to protests targeting MCWAP-2. • Risk of xenophobic attacks on foreign nationals 	Construction Operation and closure	Medium (-)	<ol style="list-style-type: none"> 1. Develop a MCWAP-2 transformation policy that describes how the Project will address local employment, local procurement and community development. 2. Publicise the policy, get public feedback, and communicate progress to the public using the official communication platform. 3. Give community forums/NGOs roles to play, e.g., participating in CSI projects, being part of working groups, conducting community surveys. 4. Monitor the changing socio-political dynamics amongst communities and in the LMs. (Watching brief) 5. Engage with municipalities about community benefits in public fora, e.g., IDP review meetings. 6. Plan community benefits, employment and procurement in the context of the precedents set by industries/other mega projects like 	Low (-)

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
	<p>Community frustration with rising unemployment, lack of service delivery and labour issues.</p> <p>Some community members are despondent about the potential benefits of the Project based on precedents set by other mega projects.</p>	<ul style="list-style-type: none"> who move to the area. • Discrimination in recruitment process based on race, gender and sexual orientation • Nepotism and cronyism linked to recruitment and procurement processes. 			<p>Medupi. Where some of these precedents will not be followed, provide clear rationale to stakeholders in a transparent manner.</p> <ol style="list-style-type: none"> 7. Stakeholder engagement plan (Aligned to MCWAP-2 SMP) 8. Communications plan (Aligned to MCWAP-2 SMP) 9. Commitments register (to record commitments made to stakeholder groups) 10. Training material for anti-corruption and bribery. 11. Impact management plans on human rights and vulnerability. 12. Complaints and grievance procedure. 	
	<p>Socio-Economic: Stakeholders note disruptive business behaviour as the precedent on mega projects.</p> <p>Past disruptive business behaviour is confirmed in media reports.</p>	<ul style="list-style-type: none"> • Project delays due to disruptive business behaviour. • Protests related to allegations of unfair recruitment and procurement processes, including nepotism and cronyism. 	Construction Operation and closure	Medium (-)	<ol style="list-style-type: none"> 1. Do not defer stakeholder engagement responsibilities to existing forums as existing forums may have their own bias/agendas. 2. Disseminate information through the official communication platform to manage the perception that any one party is more informed or benefitting more than another. 3. If a CLO is appointed, monitor his/her local impact to ensure he/she does not collude with community members/municipality. 4. Monitor changes in the socio-political dynamics amongst communities and within the municipalities; in particular politicians inciting protests, inter-community fighting over project benefits and competition between business forums. (Watching brief) 5. Provide supplier development and training for local businesses. 	Low (-)

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
	Disruptive business behaviour is prevalent and more violent in Lephalale than Thabazimbi.	<ul style="list-style-type: none"> • Rapid increase in the number of business forums, either formally or loosely formulated, that force construction projects to procure them. • Allegations of corruption and bribery, and unfair labour practices by contractors (non-payment of labour) • Opportunities: • Local recruitment and procurement to enhance the multiplier effect on the local economy through hiring local labour 			<ul style="list-style-type: none"> 6. Ring-fence employment opportunities (at multiple levels). 7. Unbundle contracts to ring-fence procurement opportunity to increase localisation. 8. Simplify the tender process for local procurement opportunities. 	

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
		<ul style="list-style-type: none"> To develop communities through direct benefits of employment and procurement. 				
	<p>Socio-Economic: Local recruitment and procurement to enhance the multiplier effect on the local economy through hiring local labour.</p> <p>To develop communities through direct benefits of employment and procurement.</p>	<ul style="list-style-type: none"> SMME Development Job creation and skills development; Indirect employment impacts 	Construction Operation and closure	Low (+)	N/A	Low (+)
	<p>Socio-Economic:</p> <p>It was noted in interviews that public violence and protest action is prevalent in</p>	<ul style="list-style-type: none"> Public violence and destruction of property resulting from the perception that procurement 	Construction Operation and closure	Medium (-)	<ol style="list-style-type: none"> Develop targeted partnerships with SAPS, farm watch groups and Community Police Forums (all listed in this baseline report) for the purposes of gathering intelligence before incidences occur, devising response plans should such incidences occur. The contractor must monitor their sub-contractors' labour and procurement 	Low (-)

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
	reaction to dissatisfaction with construction projects.	<ul style="list-style-type: none"> • Allegations of corruption and bribery. • Wage disputes and resulting project delays 			<ul style="list-style-type: none"> practices to ensure that their labour and procurement practices are fair and legal. 3. Ring-fence employment opportunities (at multiple levels). 4. Training on the Voluntary Principles on Security and Human Rights for security personnel. 5. Demarcate a space for picketing and receipt of memoranda from protesting groups. 6. Develop a security risk assessment and emergency response plans to deal with unforeseen site disruptions. 7. Develop site disruption contingency plans. 	
	<p>Socio-Economic: The following crimes in the local municipal areas are already prevalent:</p> <ul style="list-style-type: none"> • Theft of cables, diesel, equipment and livestock; • Poaching; • Burglaries; • Assault; • Farm murders; and • Hijacking 	<ul style="list-style-type: none"> • Crime levels and other social ills increasing due to the influx of workers and job-seekers. The ills are associated with access to money after staff are paid, gender dynamics, and co-existence of multiple nationalities. • Xenophobic attacks as foreign nationals are blamed for all crime in the area. 	Construction Operation and closure	Medium (-)	<ul style="list-style-type: none"> 1. Identify community benefit organisations that work towards reducing these types of social ills, focusing particularly on the hotspot areas. 2. Build partnerships with these organisations to support their efforts by providing support and resources, e.g., financial resources, expertise, skills training, access to other support entities. 3. Training on the Voluntary Principles on Security and Human Rights for security personnel. 4. Develop a security risk assessment and emergency response plan. 5. Community development/CSI programs. 	Low (-)

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
		<ul style="list-style-type: none"> Human rights risk resulting from e.g., detention without charge of suspected criminals and other violations. Possibility of unfair stop and search of people in the area just passing through. 				
	<p>Landowners note that the following crimes in the immediate project area are prevalent:</p> <p>Trespassing; Theft; Poaching; Burglaries; and Farm murders</p> <p>Landowners fear that the Project will exacerbate these crimes.</p>	<ul style="list-style-type: none"> Crime experienced by landowners as a result of influx of workers and work-seekers during construction, e.g., theft of/harm to livestock and game, harm to people living and working on the properties, destruction of 	Construction Operation and closure	Medium (-)	<ol style="list-style-type: none"> Develop and implement an access control plan. The plan must include, amongst other things, measures to ensure that only legitimate employees and visitors enter the site, e.g., fingerprint access. Work within the parameters of existing landowner security measures that will ensure the safety of landowners, their properties and their assets. Landowners have requested that the Project employ their security staff, who are well-experienced in security issues on the impacted properties, as part of the project's security staff. Support existing efforts at visible policing and ongoing patrols. Training on the Voluntary Principles on Security and Human Rights for security personnel. Develop a security risk assessment and emergency response plan. 	Low (-)

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
		<ul style="list-style-type: none"> properties, etc. Crimes can lead to landowner refusal to grant access onto the servitude adjacent to their properties for the continuation of MCWAP-2 activities at any given time. 			<ul style="list-style-type: none"> 7. Employee vetting as part of on-boarding procedures. 8. Security management plan. 	
	<p>Socio-Economic:</p> <p>Stakeholder interviews and scientific reports have highlighted that prolonged environmental exposure could pose a serious health risk to on-site workers.</p>	<ul style="list-style-type: none"> Exposure of workers and visitors to wild and dangerous animals, high temperature conditions, vehicle accidents particularly because of the bad roads, and the risk of contracting and spreading COVID-19 and other 	<p>Construction Operation and closure</p>	<p>Medium (-)</p>	<ul style="list-style-type: none"> 1. Develop a health and safety plan specifically for onsite staff and conditions. The plan must include, amongst other things: 2. Provision of PPE to protect workers from dangerous animals, harsh elements and COVID-19. 3. Keeping anti-venom onsite. 4. Guidance on working in extreme weather conditions (heat, thunder storms, rain, flooding). 	<p>Low (-)</p>

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
		communicable diseases.				
	Socio-Economic: Stakeholders, particularly landowners, noted that the project area is prone to veld fires, which can cause severe harm to property if the risk is not properly mitigated.	<ul style="list-style-type: none"> Increased risk of veld fires due to the presence of more people in the project area who may not be as vigilant as the landowners. Veld fires caused by negligence can lead to landowner refusal to grant access onto the servitude adjacent to their properties for the continuation of MCWAP-2 activities at any given time 	Construction Operation and closure	Medium (-)	<ol style="list-style-type: none"> Develop a veld fire-fighting response plan in the parameters of the existing plans that landowners currently use. Conduct veld fire-fighting training for staff. Make use of experienced fire fighters that work for landowners. Develop an emergency response plan which includes evacuation of people and animals. Code of conduct signed by all employees to foster respect for landowner property and the environment. 	Low (-)
	Socio-Economic: Economic and material well	<ul style="list-style-type: none"> Loss of productive land or business value; 	Construction Operation and closure	Medium (-)	<ol style="list-style-type: none"> The loss of productive land or of business value is handled in terms of prevailing RSA legislation. Agreement should be reached with the impacted landowner regarding the 	Low (-)

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
	being	<ul style="list-style-type: none"> Recreational or tourism business impacts 			construction programme and impacts on the property during construction. Agreements made prior to construction with respect to property access, the duration of construction and the impacts on the land should be adhered to by both the landowner and the contractor.	
	Agriculture	<ul style="list-style-type: none"> Loss of grazing land; Loss of agricultural production 	Construction Operation and closure	Low (-)	<ol style="list-style-type: none"> Keep the footprint as small as possible. Restore and reseed the site. Compensate the farmer for loss of income if there is damage to grazing land outside of the borrow pit footprint as a result of the construction and mining activities. 	Low (-)
	Historical and cultural resources	Disturbance of historical and cultural resources	Construction Operation and closure	Medium (-)	<ol style="list-style-type: none"> No sites of heritage significance were identified within the proposed footprint. For any chance finds: <ul style="list-style-type: none"> Stop all works in the vicinity of the find, until a solution is found for the preservation of these artefacts, or advice from the relevant authorities is obtained. Immediately notify a foreman. The foreman will then notify the Construction Manager and the Environment Control Officer (ECO)/Environmental Manager (EM). Record details in Incident Report and take photos of the find. Delineate the discovered site or area; secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged until the responsible local authorities take over. Preliminary evaluation of the findings by archaeologists. The archaeologist must make a rapid assessment of the site or find to determine its importance. Based on this assessment the appropriate 	Low (-)

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
					<p>strategy can be implemented. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage such as aesthetic, historic, scientific or research, social and economic values of the find.</p> <ul style="list-style-type: none"> • Sites of minor significance (such as isolated or unclear features, and isolated finds) should be recorded immediately by the archaeologist, thus causing a minimum disruption to the work schedule of the Contractor. The results of all archaeological work must be reported to the SAHRA, once completed. • In case of significant find the SAHRA should be informed immediately and in writing within 7 days from the find. • The onsite archaeologist provides the Heritage team with photos, other information as relevant for identification and assessment of the significance of heritage items. • The SAHRA must investigate the fact within 2 weeks from the date of notification and provide response in writing. • Decisions on how to handle the finding shall be taken by the responsible authorities. This could include changes in the layout (such as when finding an irremovable remain of cultural or archaeological importance) conservation, preservation, restoration and salvage. • Construction works could resume only after permission is granted from the responsible authorities. 	

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
					<ul style="list-style-type: none"> One of the main requirements of the procedure is record keeping. All finds must be registered. Photolog, copies of communication with decision-making authorities, conclusions and recommendations/guidance, implementation reports are kept. 	
	Existing Infrastructure	Disruption of existing services and relocation of infrastructure	Construction Operation and closure	High (-)	<ol style="list-style-type: none"> An asset and infrastructure register has been completed for the entire project area as well as the property on which Borrow Pit D is located. The Contractor is to be aware of the assets, infrastructure and services on the property. Ensure access to infrastructure is available to service providers at all times. Immediately notify service providers of disturbance to services. Rectify disturbance to services, in consultation with service providers. Maintain a record of all disturbances and remedial actions on site. Notify landowners of any disruptions to essential services. Deviate landowners' existing services (e.g. reticulation, irrigation lines), where possible, to accommodate construction activities. Adequate reinstatement and rehabilitation of affected environment. 	Low (-)
	Aesthetics	Reduction of visual quality of receiving environment Loss of sense of place; Light pollution	Construction Operation and closure	High (-)	<ol style="list-style-type: none"> To reduce visual intrusion, fences must be of a robust mesh type. Shiny galvanized or white coloured fencing must be avoided for permanent security fencing around infrastructure areas. Where practically feasible the security fence must be offset between any roads or farmstead boundary and a green buffer zone must be kept in place to shield receptors from both the infrastructure and the security fencing. Advertising and lighting will be in accordance with relevant norms and standards. 	Low (-)

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
					<ol style="list-style-type: none"> 3. Lighting will be sufficient to ensure security but will not constitute 'light pollution' to the surrounding areas. 4. The site will be shielded /screened through maintaining the natural vegetation to minimise the visual impact, where practicable. 5. On-going housekeeping to maintain a tidy construction area. 6. After the construction phase, the areas disturbed that are not earmarked for operational purposes (part of infrastructure footprint) must be rehabilitated. Rehabilitation must take place concurrently, especially due to the extent of the pipeline. As soon as a section becomes available for rehabilitation, the area must be revegetated. This will further assist with alien vegetation control, as these species are opportunistic and will invade areas left disturbed. 7. Temporary construction signs and barricading must be removed as soon as the particular activity or set of activities are complete and in accordance with health and safety requirements. 8. Camouflage netting to be draped over stockpile areas and temporarily secured with pegs where stockpiles are situated next to main roads or close to homesteads and within view of tourist accommodation 9. All temporary buildings or office containers must fit into the surroundings through the appropriate use of colour such as shades of dark olive, khaki brown or a grey brown colour. 10. The use of highly reflective material should be avoided, and any metal surface should be painted to fit into the surrounding environment in a colour that blends in effectively with the background. White 	

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
					<p>structures to be avoided as these will form a significant contrast with the natural surroundings. Construction activities should be restricted to daylight hours as far as possible, to limit the need to bright floodlighting and the potential for sky glow</p> <ol style="list-style-type: none"> 11. The Contractor shall not deface, paint, damage or mark any natural feature (e.g rocks, etc.) situated on or around the site for survey or any other purposes unless agreed beforehand with the stakeholders. Any features affected by the Contractor in contravention to the above shall be rehabilitated/restored to the satisfaction of the stakeholder. 12. To ensure a more unified and neat appearance, the permanent security fence at surface infrastructure areas should be approved by Engineer. 13. Low level lighting or limit mounting heights of lighting fixtures by utilising footlight or bollard level lights. The use of high light masts and high pole top security lighting should be avoided along the security fence of infrastructure areas Any high-level masts should be covered to reduce glow and light spillage. 14. Use minimum lumen or wattage in light fixtures, where possible and practical. 15. Up lighting of structures must be avoided where possible, with lighting installed downward angles that provide precisely directed illumination beyond the immediate surroundings of the infrastructure, thereby minimising the lights. 	
	Traffic & Access	Poor Road conditions	Construction Operation and closure	High (-)	<ol style="list-style-type: none"> 1. Determine and document the road conditions of public roads, as well as all private access roads that will be affected by construction traffic, as relevant. 	Low (-)

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
		Disruptions to existing road users Safety risks Crossing main roads Increase in dust levels Road maintenance			<ol style="list-style-type: none"> 2. Selective upgrade of the relevant access roads to ensure that they are capable of accommodating the type of vehicles and/or mechanical plant using these roads. 3. Obtain the necessary approval for road upgrades, wayleave for road construction from the relevant authorities, as applicable. 4. Ensure temporary accommodation of traffic where any public or private roads are to be affected by construction activities. 5. Make provision for community members to access their properties safely. 6. Clearly demarcate all access/ haul roads. 7. Proper access control is to be maintained to prevent livestock / game from accessing borrow pits. 8. Strict adherence to speed limits by construction vehicles on public roads and access roads. Appropriate speed limits need to be posted on all access roads according to the geometric design and limitations of heavy vehicles. 9. The access roads need to provide sufficient width for heavy vehicles to navigate around curves in the road. 10. When construction vehicles are required to cross provincial and district roads (as relevant) appropriate safety and traffic calming measures need to be in place. This will include flag men, speed reductions and warning signage. 11. The payloads delivered by heavy vehicles need to be recorded and audited to prevent overloading of heavy vehicles. 12. Traffic accommodation to South-African Road Traffic Signs Manual standards 	

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
					<p>where any construction affects an existing road.</p> <p>13. Implement traffic monitoring which includes –</p> <ul style="list-style-type: none"> • Baseline traffic monitoring, 1 year ahead of construction, to confirm the traffic status quo on the road links that are to be worst affected. • Traffic Monitoring during the construction period, to confirm whether the traffic increase is similar to forecasted increase, whether the contractor complies with activity time restrictions, whether posted speed limits are adhered to, etc. • Overloading Management through auditing of bulk construction material delivery slips to ensure high-level adherence to current legislation. • Monitoring of dangerous locations (e.g. truck crossings, schools, road diversions etc.). • Traffic monitoring after completion of construction (operation phase), 6 months after construction to confirm the new level of traffic resulting from normal operations. 	
Storing of soil and materials	Soil and overburden stockpiles	Over handling and relocation of materials that can be used for rehabilitation purposes	Post-construction/rehabilitation /closure	High (-)	<ol style="list-style-type: none"> 1. The ideal is to place all overburden materials removed at quarry opening in their final closure location, or as close as practicable to it. This must be considered and planned for in the planning phase prior to the commencement of any mining operations. 2. To ensure that they remain available for future use all soil stockpiles should be placed in clearly defined no-go areas, this location is to be agreed upon by the applicant, contractor and the ECO. 3. The locations of the stockpile area should be on a topographical crest to ensure free drainage in all directions. If this is not possible then an alternative is a side-slope 	Low (-)

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
					<p>location with suitable cut-off berms constructed upslope.</p> <p>4. If long-term topsoil storage is not deemed feasible by DWS for certain parts of the site, imported topsoil which is devoid of invasive plant seeds and/or noxious weed must be used.</p> <p>5. Vegetation clearing may only take place within the development footprint.</p>	
Decommissioning and removal of infrastructure and structures	Landscape Topography Groundwater	Infrastructure and structures not removed off site	Post-construction/rehabilitation /closure	High (-)	<ol style="list-style-type: none"> 1. The operation will require no permeant infrastructure on site. 2. Temporary toilets located on site will be removed, as well as any mining machinery and designated waste bins. 3. Clear and completely remove from site all construction plant, equipment, storage containers, temporary fencing, temporary services, fixtures and any other temporary works. 4. Materials that will not be used again must be rehabilitated to blend in with the surrounding landscape. 5. Ensure that all access roads utilised during construction (which are not earmarked for closure and rehabilitation) are returned to a usable state and / or a state no worse than prior to construction. 6. There will also be the removal of all signage, fencing, traffic barriers, etc. 7. All infrastructure rubble and residual foundations need to be covered with at least one metre of cover material. 8. Best practice is to cover with 1 metre of inert cover material (which may be "B" or "C" horizon material that can be penetrated by plant roots), which in turn is covered with topsoil material. 9. The infrastructure sites can then be formally included in the remainder of the Mine site rehabilitation process - these sites can then 	Low (-)

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
					be re-vegetated and included in all post-closure monitoring and maintenance procedures.	
Waste removal	Natural surroundings	Lack of proper clearance of waste and rubble that results in rubble remaining on site following operation of the borrow pit	Post-construction/rehabilitation /closure	High (-)	<ol style="list-style-type: none"> 1. Clear the site of all inert waste and rubble, including surplus rock, foundations and batching plant aggregates. 2. Load and haul excess spoil and inert rubble to fill in borrow pits / or to dump sites indicated / approved by the EO / ECO. 3. Remove from site all domestic waste and dispose of in the approved manner at a registered waste disposal site. 	Low (-)
Hazardous waste removal	Groundwater Soil	Inadequate removal of hazardous waste	Post-construction/rehabilitation /closure	High (-)	<ol style="list-style-type: none"> 1. Remove from site all temporary fuel stores, hazardous substance stores, hazardous waste stores and pollution control sumps. Dispose of hazardous waste in the approved manner. 2. Remove from site all pollution containment structures. 3. Dispose of materials that will not be used again as hazardous waste. 	Low (-)
Stormwater management	Soil Water resources	Excessive runoff and erosion as a result of poor stormwater management	Post-construction/rehabilitation /closure	High (-)	<ol style="list-style-type: none"> 1. Ensure that the entire project area drains properly into the designed stormwater drainage system or in a manner which does not cause or encourage ponding or erosion. 2. Where required, the project area must have the following erosion preventative measures installed: Permanent stormwater drainage system. Organic stabilisation of soil (mulch and straw). Chemical stabilisation of soil (where approved by the ECO). Installation of organic erosion structures (logging and brush bunds). Vegetation by seeding or instant lawn. 	Low (-)

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
					3. Permanent stormwater drainage system must consist of the following: Silt dam (receives all excess stormwater drainage) 4. Cut off drain (directs all stormwater drainage to the silt dam). 5. Earth bunds (directs all surface run-off to the cut off drain)	
Reshaping of the landscape Backfilling Re-vegetation	Topography Gradient soil	Inadequate backfilling and reshaping of the landscape. Poor re-vegetation	Post-construction/ rehabilitation /closure	High (-)	1. Backfill all prospecting boreholes, excavations and test pits with insitu material. 2. The new slopes must mimic the natural slopes and topography. 3. Where possible, programme the backfill of excavations so that subsoil is deposited first, followed by the topsoil. 4. Additional fill may only be imported from approved borrow areas as indicated by the EO / ECO. 5. Monitor backfilled areas for subsidence (as the backfill settles) and fill depressions using available material. 6. Shape all disturbed areas to blend in with the surrounding landscape. 7. Ensure that no excavated material or stockpiles are left on site and that all material remaining after backfilling is smoothed over to blend in with the surrounding landscape. 8. All areas disturbed by mining activities are to be re-vegetated to the satisfaction of the ECO and in line with the rehabilitation plan. 9. Methods of vegetation removal and reestablishment, where required, shall be specified by the ECO, in terms of: <ul style="list-style-type: none"> o Source of vegetative material. o Ground preparation. o Weed removal. o Planting times. o Removal and storage of vegetation 10. Fertilisers and compost may not be used unless agreed to by the ECO.	Low (-)

NAME OF ACTIVITY	ASPECTS AFFECTED	POTENTIAL IMPACT	PHASE	SIGNIFICANCE (if not mitigated)	MITIGATION TYPE	SIGNIFICANCE if mitigated
					<ul style="list-style-type: none"> 11. All planting work is to be undertaken by a suitably qualified Contractor, making use of the appropriate equipment. 12. Transplant deciduous trees, before the new growth appears. 13. Bulbous plants may be transplanted at any time of the year. 14. Tree seedling material should be fresh and of local origin. Resist using plants from far afield as they may not be best suited to local climatic or soil conditions. 15. Small seedlings are likely to transplant more successfully than will large ones. These should be potted and kept under nursery conditions until they are large enough to plant out. 	

j) Summary of specialist reports.

Table 12: Summary of Specialist Reports

LIST OF STUDIES UNDERTAKEN (APPENDIX D)	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
Palaeontological Impact Assessment, (Groenewald, 2020)	All recommendations by specialists have been included in the Impact Assessment and EMP sections of this Report.	X	Impact Assessment
Biodiversity Report (STS, 2021) including: Part A – Background Part B – Floral Assessment Part C – Vertebrate Assessment Part D – Invertebrate Assessment		X	Impact Assessment
Socio – economic Baseline Study (Bapuleng, 2021)		X	Impact Assessment
Freshwater Ecosystem Assessment (SAS, 2021)		X	Impact Assessment
Heritage Impact Assessment (G&A Heritage, 2020)		X	Impact Assessment
Assets and Infrastructure Baseline Study: Inception Report (GBN-JV, 2021)		X	Impact Assessment
Landscape and Visual Impact Assessment (Inter Design Landscape Architecture, 2021)		X	Impact Assessment

k) Environmental impact statement

(i) Summary of the key findings of the environmental impact assessment;

Table 13: Summary of Key Findings of the Impact Assessment

Aspects Affected	Potential Impacts	Significance if mitigated	Phase
Land Use	<ul style="list-style-type: none"> Land acquisition and servitude restrictions. Disruptions and alterations to existing land use 	Low (-)	Construction Operation and closure
Climate	<ul style="list-style-type: none"> Greenhouse gas emissions. Contributions to global warming. 	Low (-)	Construction Operation and closure
Soils	<ul style="list-style-type: none"> Soil erosion Soil contamination 	Low (-)	Construction Operation and closure
Geohydrology	<ul style="list-style-type: none"> Contamination of groundwater by poor construction/mining practices. 	Low (-)	Construction Operation and closure
Topography	<ul style="list-style-type: none"> Erosion on steep slopes. Alteration of the natural topography of the borrow area. 	Low (-)	Construction Operation and closure
Flora	<ul style="list-style-type: none"> Loss of plant species of conservation concern 	Low (-)	Construction Operation and closure
Flora	<ul style="list-style-type: none"> Destruction of indigenous flora during site establishment 	Low (-)	Construction Operation and closure
Fauna	<ul style="list-style-type: none"> Loss of Protected species listed in terms of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) Threatened or Protected Species regulations 	Low (-)	Construction Operation and closure
Flora	<ul style="list-style-type: none"> Loss of vegetation due to fuel and chemical spills. 	Low (-)	Construction Operation and closure
Flora	<ul style="list-style-type: none"> Management of alien invasive species 	Low (-)	Construction Operation and closure
Fauna	<ul style="list-style-type: none"> Loss and displacement of animals on site. 	Low (-)	Construction Operation and closure
Flora	<ul style="list-style-type: none"> Loss of topsoil and erosion. 	Low (-)	Construction Operation and closure

Aspects Affected	Potential Impacts	Significance if mitigated	Phase
	<ul style="list-style-type: none"> Residual impacts as rehabilitation will not be adequate to reach a pre-construction state 		
Flora and Fauna	<ul style="list-style-type: none"> Damage to plant and animal life outside of the project area 	Low (-)	Construction Operation and closure
Fauna	<ul style="list-style-type: none"> Loss of Protected species listed in terms of the National Environmental Management: Biodiversity Act, No. 10 of 2004) Threatened or Protected Species regulations 	Low (-)	Construction Operation and closure
Socio-Economic	<ul style="list-style-type: none"> Dust and noise; Security; Personal safety Waste 	Low (-)	Construction Operation and closure
Socio-Economic	<ul style="list-style-type: none"> Influx of job-seekers seeking employment on these projects. 	Low (-)	Construction Operation and closure
Socio-Economic	<ul style="list-style-type: none"> Influx of job-seekers seeking employment on these projects. Attract talent and skills Increase local spending Increase cultural diversity, which builds tolerance 	Medium (+)	Construction Operation and closure
Socio-Economic	<ul style="list-style-type: none"> Xenophobia, racism, discrimination (gender) and community mistrust in local government (allegations of corruption), as the precedent on mega projects. 	Low (-)	Construction Operation and closure
Socio-Economic	<ul style="list-style-type: none"> Disruptive business behaviour as the precedent on mega projects. Past disruptive business behaviour is confirmed in media reports. Disruptive business behaviour is prevalent and more violent in Lephalale than Thabazimbi. 	Low (-)	Construction Operation and closure

Aspects Affected	Potential Impacts	Significance if mitigated	Phase
Socio-Economic	<ul style="list-style-type: none"> • Loss of productive land or business value; • Recreational or tourism business impacts 	Low (-)	Construction Operation and closure
Socio-Economic	<ul style="list-style-type: none"> • Local recruitment and procurement to enhance the multiplier effect on the local economy through hiring local labour. 	Low (+)	Construction Operation and closure
Socio-Economic	<ul style="list-style-type: none"> • Public violence and protest action is prevalent in reaction to dissatisfaction with construction projects. 	Low (+)	Construction Operation and closure
Socio-Economic	<ul style="list-style-type: none"> • Increase in crime 	Low (-)	Construction Operation and closure
Socio-Economic	<ul style="list-style-type: none"> • Health risks 	Low (-)	Construction Operation and closure
Socio-Economic	<ul style="list-style-type: none"> • Veld fires 	Low (-)	Construction Operation and closure
Agriculture	<ul style="list-style-type: none"> • Loss of grazing land; • Loss of agricultural production 	Low (-)	Construction Operation and closure
Historical and cultural resources	<ul style="list-style-type: none"> • Loss of resources of cultural or heritage importance • Chance finding of resources of cultural and heritage importance 	Low (-)	Construction Operation and closure
Existing Infrastructure	<ul style="list-style-type: none"> • Disruption of existing services and relocation of infrastructure 	Low (-)	Construction Operation and closure
Aesthetics	<ul style="list-style-type: none"> • Reduction of visual quality of receiving environment • Loss of sense of place; • Light pollution 	Low (-)	Construction Operation and closure
Traffic & Access	<ul style="list-style-type: none"> • Disruptions to existing road users • Safety risks • Crossing main roads • Increase in dust levels • Road maintenance 	Low (-)	Construction Operation and closure

Aspects Affected	Potential Impacts	Significance if mitigated	Phase
Soil Land cover	<ul style="list-style-type: none"> Over handling and relocation of materials that can be used for rehabilitation purposes 	Low (-)	Closure
Landscape Topography Groundwater	<ul style="list-style-type: none"> Infrastructure and structures not removed off site 	Low (-)	Closure
Land cover General surroundings	<ul style="list-style-type: none"> Lack of proper clearance of waste and rubble that results in rubble remaining on site following operation of the borrow pit 	Low (-)	Closure
Groundwater Soil	<ul style="list-style-type: none"> Inadequate removal of hazardous waste 	Low (-)	Closure
Soil Water resources Stormwater	<ul style="list-style-type: none"> Excessive runoff and erosion as a result of poor stormwater management 	Low (-)	Closure
Topography Landscape Vegetation	<ul style="list-style-type: none"> Inadequate backfilling and reshaping of the landscape. Poor re-vegetation 	Low (-)	Closure
Waste Removal	<ul style="list-style-type: none"> Lack of proper clearance of waste and rubble that results in rubble remaining on site following operation of the borrow pit 	Low (-)	Closure
Stormwater management	<ul style="list-style-type: none"> Excessive runoff and erosion as a result of poor stormwater management 	Low (-)	Closure
Topography Gradient soil	<ul style="list-style-type: none"> Inadequate backfilling and reshaping of the landscape. Poor re-vegetation 	Low (-)	Closure

(ii) Final Site Map

Attached as **Appendix C**

(iii) Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;

Refer to Table 11 and Table 13

l) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr;

Based on the assessment and where applicable the recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation.

All management objectives and outcomes were incorporated into the EMPr, Refer to Part B.

m) Aspects for inclusion as conditions of Authorisation

- Properties may not be accessed for construction or operation purposes unless consent has been granted by the landowner, or until the land acquisition process has been concluded and a construction servitude has been registered.
- Specific mitigation measures provided in the specialists' studies and contained within the Impact Assessment and EMPr of this BAR must be adhered to.
- Should any floral SCC be encountered during any phase of the proposed project, these species should be rescued and relocated by a suitably qualified specialist and either relocated to suitable habitat close to the project footprint, utilised for rehabilitation, or moved to registered nurseries such as the Agricultural Research Council (ARC) or the South African National Biodiversity Institute (SANBI). Permits from the LEDET and DFFE should be obtained to remove, cut, or destroy the above-mentioned protected species before any vegetation clearing may take place.
- Prior to vegetation clearance activities, walkdown of the footprint must be done to ensure that no faunal SCC are located on site. Should such species be observed, the rescue and relocation plan must be implemented and adhered to, all rehabilitation actions as per the rehabilitation management plan must be carried out and signed off by an appropriately qualified ecologist.
- Construction, operational and closure activities need to be planned and coordinated in consultation with the affected landowners in order to minimise impacts on game farming and ecotourism (if applicable).
- There were no findings of Heritage or Palaeontological significance found on the site, however if there is a discovery then the Chance Find Protocol as contained in the Heritage Report must be adhered to.
- Measures for rehabilitation as included in this BAR and all specialists' studies must be adhered to.

n) Description of any assumptions, uncertainties and gaps in knowledge

- Where data supplied by the client or other specialist consultants, has been used, it has been assumed that the information is correct unless otherwise stated.
- The assessment of site-specific impacts and mitigation measures was informed by the once-off field survey, and the relevant specialist studies, which are based on the professional opinion of the assessor/specialist.
- Regardless of the analytical and predictive method employed to determine the potential impacts associated with the project, the impacts are only predicted on a probability basis. The accuracy of the predictions is largely dependent on the availability of environmental data and the degree of understanding of the environmental features and their related attributes.

o) Reasoned opinion as to whether the proposed activity should or should not be authorised

i) Reasons why the activity should be authorized or not

It is the opinion of the EAP that the activities associated with the proposed Borrow Pit D be granted Environmental Authorisation. The opinion considered also considered all specialist studies and the impact significance before and after mitigation.

ii) Conditions that must be included in the authorisation

As per Section m above

p) Period for which the Environmental Authorisation is required.

Mining operations – 2 years
Rehabilitation – 2 years

q) Undertaking

Confirm that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Basic assessment report and the Environmental Management Programme report.

Refer to Part B, Section 3 of the report for the complete undertaking of the BAR and EMP sections.

r) Financial Provision

According to the Official guideline as contemplated in Regulation 54(1) to the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) the amount calculated for Borrow Pit D is R823 543.68 (according to the 2005 Guideline for the calculation of the quantum in terms of the MPRDA and Regulations). Therefore this figure was subjected to a CPI adjustment.

i) Explain how the aforesaid amount was derived.

The amount was derived using the rate per hectare, for Borrow Pit D, the rate per hectare is R50 000 as it is considered medium in terms of environmental sensitivity.

ii) Confirm that this amount can be provided for from operating expenditure.

The financial provision is made available for rehabilitation and remediation, decommissioning and closure activities at the end of the mining operations.

s) Specific Information required by the competent Authority

i) Compliance with the provisions of sections 24(4)(a) and (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998). the EIA report must include the:-

(1) Impact on the socio-economic conditions of any directly affected person.

A Socio-economic Baseline Study was undertaken as part of the BA Process (Appendix D). All potential socio-economic impacts were included in the impact assessment in Section 1(i), as well as in the detailed impact assessment contained in Appendix G. A summary of the recommendations from the study have been included in Section 1(k).

(2) Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act.

A Heritage Impact Assessment (HIA) was undertaken as part of the BA Process (Appendix D). All potential impacts on heritage resources were included in the impact assessment in Section 1(i), as well as in the detailed impact assessment contained in Appendix H. A summary of the recommendations from the study were included in Section 1(j).

t) Other matters required in terms of sections 24(4)(a) and (b) of the Act.

N/A

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1) Draft environmental management programme.

a) Details of the EAP

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b) Description of the Aspects of the Activity

Scope of the Mokolo Crocodile River (West) Water Augmentation Project Phase 2A:

The overall MCWAP-2A consists of the following components:

- Water Transfer Infrastructure, which entail an Abstraction Weir at Vlieëpoort on the Crocodile River (West); Desilting Works, Raw Water Pipeline, Balancing Reservoirs and Pump Stations in order to abstract and transfer of water from Crocodile River (West) to Lephalale for which Environmental Authorisation (EA) with reference number 14/12/16/3/3/2/1100 was issued by the Chief Director: Integrated Environmental Authorisations of the Department of Forestry Fisheries and the Environment (DFFE);
- Borrow Pits for the supply of bedding material, 23 of which have already been subjected to an EIA Process and awaiting EA and Borrow Pit D being one (1) of seven (7) additional borrow pits required, and
- A River Management System to manage abstractions from, and the river flow in, the Crocodile River (West) between Hartbeespoort Dam and Vlieëpoort Weir, the Moretele River from Klipvoor Dam up to the confluence with the Crocodile River (West), the reach of the Elands River from Vaalkop Dam up to the confluence with the Crocodile River (West), and also the required flow over (past) the Vlieëpoort Weir.

Figure 3 of this BAR illustrates the entire MCWAP-2 project including the proposed borrow pits. Borrow Pit D is 1 of 7 borrow pits required for bedding material for the MCWAP-2 project as indicated in Table 4.

c) Composite Map

Refer to Appendix A

d) Description of Impact management objectives including management statements

- i) **Determination of closure objectives.** (ensure that the closure objectives are informed by the type of environment described)

As per the Closure Plan in Appendix D

- ii) **Volumes and rate of water use required for the operation.**

This volume of water will be confirmed and will be included in the Water Use License (WUL), if required.

- iii) **Has a water use licence has been applied for?**

An Integrated Water Use Licence Application (IWULA) has been applied for at the Department of Water and Sanitation, which includes all components of MCWAP-2A. The project entails the following activities that constitute water uses in terms of Section 21 of the NWA:

- Section 21(a) - Taking water from a water resource (water abstraction from the Crocodile River (West) as part of the transfer scheme; taking water for construction purposes);
- Section 21(b) - Storing water (Vlieëpoort abstraction weir);
- Section 21(c) - Impeding or diverting the flow of water in a watercourse;
- Section 21(i) - Altering the bed, banks, course or characteristics of a watercourse.); and
- Section 21(f) - discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit (scouring sediment back to the Crocodile River (West))

iv) Impacts to be mitigated in their respective phases

Table 14: Impact Management Outcomes, actions and monitoring for the Pre –construction/Pre-mining Phase

No	Activity	Potential Impact	Objectives	Targets and Performance Indicators	Management and Mitigation Measures	Method of monitoring implementation	Monitoring frequency	Applicable Standard or practices	Time period for implementation	Implementation responsibility	Mechanism for monitoring compliance
1.	Applying and/or ensuring permits and licences requirements are in place.	<ul style="list-style-type: none"> Project on standby to acquire permits and licences 	<ul style="list-style-type: none"> Compliance with all applicable legislation to prevent unauthorised activities and negative impacts to protected environmental features.) 	<ul style="list-style-type: none"> All relevant approvals for the activities and protected environmental features are identified and obtained. All sensitive and protected environmental features to be identified in the construction domain (all the components of the project) 	<p>Approvals are to be in place prior to the potential impacts to the protected environmental features:</p> <ul style="list-style-type: none"> Integrated Water Use Licence from DWS for water uses in terms of Section 21 of approvals are to be in place prior to the potential impacts to the protected environmental features. Integrated Water Use Licence from DWS for water uses in terms of Section 21 of the NWA for all construction areas that occur within 500 m of any wetlands and within 100 m or within the 1:100 year floodline of any watercourses. Permit(s) from DFFE in terms of the NFA for protected plants and trees that are to be cut, disturbed, damaged, destroyed or removed. Permit from LEDET in terms of the LEMA and NEM:BA for the removal and transportation of endangered fauna and flora Permits or authorisation where Private Nature Reserves will be impacted during construction/mining activities. Permit from SAHRA for impacted on (relocated or destroyed), and for the removal of graves. The Department of Mineral Resources & Energy (DMRE) in terms of the NEMA and the MPRDA for all required borrow pits and spoil sites. Permits and licenses required for the project, in accordance with the protocols prescribed by the governing bodies. 	<ul style="list-style-type: none"> Programme Monitoring 	<ul style="list-style-type: none"> As required 	<ul style="list-style-type: none"> National Environment Management Act, 1998 (Act No. 107 of 1998) (NEMA) 	<ul style="list-style-type: none"> Pre-Construction 	<ul style="list-style-type: none"> Engineer and Contractor 	<ul style="list-style-type: none"> Report and Auditing

No	Activity	Potential Impact	Objectives	Targets and Performance Indicators	Management and Mitigation Measures	Method of monitoring implementation	Monitoring frequency	Applicable Standard or practices	Time period for implementation	Implementation responsibility	Mechanism for monitoring compliance
2.	Environmental Awareness Creation	<ul style="list-style-type: none"> Environmental or social impacts due to lack of environmental/ social awareness Incidence and injuries 	<ul style="list-style-type: none"> Ensure that the Contractor, construction workers and site personnel are aware of the relevant provisions of the CEMPr, sensitive environmental features and agreements made with the affected landowners and community members. 	<ul style="list-style-type: none"> Identification of all the required site specific and life skills training for employees All construction workers and employees are to have completed environmental training before being allowed on the construction/mining site. Total number of complaints and corrective actions taken. Approved training material 	<ul style="list-style-type: none"> Environmental Training and Awareness Programme to be developed, which is to be approved by the Engineer. The Contractor must arrange that all of his employees and those of his sub-contractors go through the project specific environmental awareness training courses before the commencement of construction/mining and as and when new staff or sub-contractors are brought on site. The environmental training is compulsory for all employees and structured in accordance with their relevant rank, level and responsibility, as well as the Environmental Specification as they apply to the works and site. Personnel should be trained on identification of protected flora (booklets to be provided) to assist with marking of such species in the construction footprint or, to demarcate species that must be excluded from vegetation clearing activities. A nominated member / representative for each construction team must undergo a snake handling course and be provided with the relevant snake catching and safety equipment. This will ensure that should a snake be located within the trench or contractor sites and is unable to move of by itself, the snake can be safely removed from the area with minimal delay to the construction team. If need be a leaflet / poster should be developed highlighting the various types of species and the most dangerous ones that staff may encounter when on site in order to create better awareness. All personnel, prior to the commencement of site work or their duties should be educated about smaller venomous spiders and scorpions which can often be disturbed by earth moving activities and may fall into the excavations whilst foraging at night. These species are to be carefully removed if need be and placed in an undisturbed area nearby. If need be a leaflet / poster should be developed highlighting the various types of species and the most dangerous ones that staff may encounter when on site in order to create better awareness. 	<ul style="list-style-type: none"> Keep a record of environmental training undertaken is to be kept on site. 	<ul style="list-style-type: none"> Weekly 	<ul style="list-style-type: none"> NEMA 	<ul style="list-style-type: none"> Throughout the project lifecycle 	<ul style="list-style-type: none"> Contractor 	<ul style="list-style-type: none"> Reporting on the Training programmes

No	Activity	Potential Impact	Objectives	Targets and Performance Indicators	Management and Mitigation Measures	Method of monitoring implementation	Monitoring frequency	Applicable Standard or practices	Time period for implementation	Implementation responsibility	Mechanism for monitoring compliance
3.	On-going Consultation with Community and Affected Parties	<ul style="list-style-type: none"> Social unrest. Delay in progress of construction. 	<ul style="list-style-type: none"> Establish and maintain a record of all complaints and claims against the project and ensure that these are timeously and effectively verified and responded to. Adhere to agreements made with Local Authorities, Traditional Authorities, individual landowners and community members regarding communication. Surrounding landowners and communities have been consulted with prior to and during construction. 	<ul style="list-style-type: none"> Records of consultation with surrounding landowners and communities are available prior to and during construction. Total number of complaints and corrective actions taken. 	<ul style="list-style-type: none"> Affected and neighbouring landowners that will be impacted and affected by construction/mining activities must be given 12 months' notice before commencement of construction activities to enable them to make necessary arrangements. Establish lines of communications with landowners and community members. Existing communication channels need to be duly respected and adhered to when engaging with the Traditional Authorities. Establish processes and procedures to effectively verify and address complaints and claims received. Complaints or liaison with landowners and community members with regard to environmental aspects, compensation or disturbance to activities or animals, must be recorded, reported to the correct person and a record of the response is to be entered in the complaints register. Provide the relevant contact details to landowners and community members for queries / raising of issues or complaints. Inform the impacted landowners of the construction programme in relation to the affected properties. Agreements made prior to construction with respect to property access, the duration of construction and the impacts on the land should be adhered to by both the landowner and the contractor. Provide all information, especially technical findings, in a language that is understandable to the general public. The dominant local languages are Afrikaans, Sepedi and Setswana. Promptly deal with any raised expectations amongst communities regarding perceived benefits associated with the project, through a process of communication and consultation. Include all relevant community members in decisions affecting them. 	<ul style="list-style-type: none"> Public complaints register. Proof of consultation and notifications 	<ul style="list-style-type: none"> Daily 	<ul style="list-style-type: none"> NEMA 	<ul style="list-style-type: none"> Throughout the project lifecycle 	<ul style="list-style-type: none"> Contractor – Social Officer and Engineer-Social Monitor ECO 	<ul style="list-style-type: none"> Audits of the complaints register

No	Activity	Potential Impact	Objectives	Targets and Performance Indicators	Management and Mitigation Measures	Method of monitoring implementation	Monitoring frequency	Applicable Standard or practices	Time period for implementation	Implementation responsibility	Mechanism for monitoring compliance
4.	Site Establishment	<ul style="list-style-type: none"> • Damaged sensitive environmental features • Infestation of alien vegetation • Loss of soil through contamination, wind and water erosion. • Loss of biological viability of stockpiled topsoil due to poor handling. • Excess material requiring spoiling • Disturbance of soil stability or ground cover. • Potential silt discharge into streams or wetland. • Erosion damage • Theft vandalism or unauthorised people simply wandering and exposing themselves to risk or injury • Damage to sensitive environment 	<ul style="list-style-type: none"> • Proper planning and layout of the construction/mining domain to ensure protection of sensitive environmental features • Manage environmental impacts associated with site clearing. • Ensure that only areas that are specifically required for the construction/mining purposes are cleared. • Prevent impacts to existing services. • Adhere to agreements made with owners/custodians of the services. 	<ul style="list-style-type: none"> • No impacts to sensitive environmental features as a result of poor construction site planning and layout. • The entire construction/mining footprint is to be included in the pre-construction survey • Approved site plan • No clearing outside of construction/mining domain. • No access or encroachment into no-go areas. • Total number of security complaints and corrective actions taken. • No existing services and infrastructure destroyed. • No adverse impacts to existing services and infrastructure. • All relevant approvals to be obtained prior to working within existing servitudes (including roads, railway line, power lines, telephone lines, etc.) 	<ul style="list-style-type: none"> • The Contractor is to establish site in accordance with the plan approved by the Engineer prior to the establishment of the site, which aims to identify construction/mining activities, facilities and structures in relation to sensitive environmental features. This plan will serve as a spatial tool that facilitates the execution of the construction/mining phase with due consideration of sensitive environmental features (based on specialist studies and findings from walk-down survey). The plan must show the following (as relevant): <ul style="list-style-type: none"> ○ Contractors' camp and lay down areas; ○ Site offices; ○ Site laboratories; ○ Batching plants; ○ Crusher plants; ○ Access / haul routes; ○ Gates and fences; ○ Essential services (permanent and temporary water, electricity and sewage); ○ Solid waste storage and disposal sites; ○ Site toilets and ablutions; ○ Hazardous waste storage and disposal sites; ○ Firebreaks; ○ Excavations and trenches; ○ Cut and fill areas; ○ Topsoil stockpiles; ○ Spoil areas; ○ Construction material stores and laydown areas; ○ Vehicle and equipment stores; ○ Workshops; ○ Wash bays; ○ Fuel stores; ○ Hazardous substance stores; ○ Sensitive environmental features; and ○ Any other activities, facilities and structures deemed relevant. • Photographic record as part of the pre-construction survey of areas to be affected by construction activities including crack survey of structures such as houses and private roads. • Suitably experienced personnel (relevant to the potentially affected environmental features) are to monitor the clearing activities, with particular focus on: <ul style="list-style-type: none"> ○ Protected fauna and flora species; and ○ Wetlands. 	<ul style="list-style-type: none"> • Resurvey and site monitor • Site Monitoring • Site layout approved by Engineer 	<ul style="list-style-type: none"> • As required 	<ul style="list-style-type: none"> • National Environmental Management: Biodiversity Act (NEMBA) 	<ul style="list-style-type: none"> • Preconstruction 	<ul style="list-style-type: none"> • Engineer and • Contractor 	<ul style="list-style-type: none"> • Audits and Reporting

No	Activity	Potential Impact	Objectives	Targets and Performance Indicators	Management and Mitigation Measures	Method of monitoring implementation	Monitoring frequency	Applicable Standard or practices	Time period for implementation	Implementation responsibility	Mechanism for monitoring compliance
					<ul style="list-style-type: none"> • Search, rescue and relocation activities processes are to be in place ensuring decreased disturbances to such species. The boundaries of all sensitive areas (flora, fauna, wetlands, and palaeontology and heritage) are to be clearly demarcated according to the updated assessment prior to construction/mining using markers. These areas (with the exception of the areas for which the necessary authorisations have been obtained) are to be clearly marked as no-go areas for the duration of the construction and decommissioning phases. • The details of how site clearing will be executed. Where possible, clearing by hand is recommended in order to create employment opportunities. • Restrict site clearing activities to the approved construction/mining footprint. Ensure no footprint creep into any wetlands or watercourses or other sensitive areas takes place. No vegetation clearing is to take place outside of the demarcated zones or within the appropriate buffers of demarcated sensitive habitats. • Clearing of vegetation is to be conducted in a phased manner (where possible), with due consideration of the search and rescue activities. Where alien vegetation is cleared, it will be necessary to ensure no propagules (seeds and any vegetative part of the plant that can produce new seedlings) are left on bare ground. All alien vegetation must be carefully removed and disposed of to prevent such species from re-establishing on the disturbance footprint or spread to adjacent, uninvaded habitat. • Vegetative cover, especially for sensitive areas such as riparian zones (only Borrow Pit E), is to remain for as long as possible. The phased approach will also help minimise dust pollution which may smother surrounding vegetation and affect/irritate the respiratory tracts of faunal species in the affected area. • Vegetation clearance along the construction/mining footprint must be minimized by fencing off the work area and restricting vehicular access outside this area. • Monitor and maintain barricading around sensitive environmental features. • Construction personnel must take care when moving dead logs / branches and large rocks / boulders within the footprint area as these structures often harbour snakes, scorpions and spiders underneath or within them. Some of these species are venomous and pose a risk to personnel if not carefully dealt with and relocated safely. • Prohibit site clearing personnel from hunting / trapping / poaching / snaring of fauna and the harvesting of indigenous flora outside of the authorised construction footprint. 						

No	Activity	Potential Impact	Objectives	Targets and Performance Indicators	Management and Mitigation Measures	Method of monitoring implementation	Monitoring frequency	Applicable Standard or practices	Time period for implementation	Implementation responsibility	Mechanism for monitoring compliance
					<ul style="list-style-type: none"> • Time intensive construction activities to avoid Ruigtevley 97 KQ,Ptn. 5 (Borrow Pit G site) (-24.314810°: 27.444732) during breeding season for Secretary Bird (<i>Sagittarius serpentarius</i>) June to December (eggs laid in June-July, nestling period 2.5-4 months). • All permits for relocation should be provisionally investigated and if possible, granted prior to the search and rescue operation and decisions made as to possible ways forward during the baseline stage so as to avoid lengthy delays are undue stress to the affected species. • Only authorised personnel are to be permitted within and in the vicinity of any construction/mining footprints and any associated wetlands or watercourses (Borrow Pit E). • Existing vegetation (on the periphery of the proposed areas identified for above ground infrastructure) must be retained to screen and limit contrast in colour between the stripped ground surface and the existing landscape. • Positioning of the storage and lay-down areas should aim to minimise visual impacts. • Control the movement of all vehicles and plant (including suppliers), such that they remain on designated routes and comply with relevant agreements. • Minimise public disturbance from lighting of the construction camp and site. For example, proper design of the placing (zones), height, type, direction (inward rather than outward) and intensity of floodlights, without compromising safety. Red down lighting can be considered in order to limit insect attraction at night and potential disturbance to nocturnal insect navigation (use of the moon light). Red lights will also decrease the impact of the night vision of nocturnal species. 						

No	Activity	Potential Impact	Objectives	Targets and Performance Indicators	Management and Mitigation Measures	Method of monitoring implementation	Monitoring frequency	Applicable Standard or practices	Time period for implementation	Implementation responsibility	Mechanism for monitoring compliance
					<ul style="list-style-type: none"> • Camps and contractor laydown areas should be, as far as possible, located in areas of low sensitivity or where previous disturbance has occurred. Areas where increased baboon spider density is evident should be avoided. This is also applicable to rocky areas and areas with large fallen trees / logs, as such structures provide habitat and areas of refuge for several spider and scorpion species. • Land acquisition and compensation to adhere to prevailing legal framework and international guiding principles. • Land required for the construction/mining servitudes must be acquired in accordance with prevailing statutory requirements. • Identify and record all existing services. • Conform to requirements of relevant service providers. Agreements to be in place prior to construction/mining in affected areas. • Immediately notify service providers of disturbance to services. Rectify disturbance to services, in consultation with service providers. Maintain a record of all disturbances and remedial actions on site. • Notify landowners of any disruptions to essential services. • Relocate landowners' existing services (e.g., reticulation, irrigation lines, power lines), where possible, to accommodate construction activities. • Liaise with property owners to ensure that existing infrastructure is recorded and any damage repaired satisfactorily or compensated for. • If there is a risk of damage taking place on a property as a result of construction/mining, a condition survey should be undertaken prior to construction and record maintained. • Provide a channel through which communities can route grievances or concerns regarding service disruption as a result of the project. • Regularly monitor the effect that the project has had on existing infrastructure facilities and social services within the host community. 						

Table 15: Environmental Management and Mitigation Measures that must be implemented during Mining, Post Mining and Rehabilitation Phases

ID	Aspect	Potential Risk and Impact	Objectives	Performance Indicators and Targets	Mitigation measure / Procedure	Monitoring Methods	Monitoring Frequency	Applicable Standards or practices	Time period for implementation	Implementation Responsibility	Mechanism for Monitoring Compliance
1. Management of Safety and Security	<ul style="list-style-type: none"> Safety 	<ul style="list-style-type: none"> Injury to site staff from construction, mining and blasting activities. Damage to vehicles and building as a result of blasting activities. Injury or fatal accidents of construction workers during the upgrade of roads. Potential injury and death to fauna and livestock from falling into open trenches/excavation. 	<ul style="list-style-type: none"> The safety and security of the public and project workforce is of paramount importance and must not be compromised by the activities associated with the construction and mining phases. 	<ul style="list-style-type: none"> Low incidents of injured on duty (IOD's) on site. Low incidents of reported pedestrian accidents. Records kept of health and safety training conducted for all staff on site. Visible evidence and use of PPE. Trenches are demarcated. Approved Contractor's method statement. 	<ul style="list-style-type: none"> PPE to be provided and well maintained at contractor's camp. All incidents should be reported to the EM, investigated, documented and kept in the safety file. All personnel are to undergo Environmental Awareness and Safety Training. A signed register of attendance must be kept for proof. Open trenches must be checked daily for any wildlife that may have fallen into them. The Contractor shall recognise that the site is situated close to inhabited areas and shall therefore take all reasonable measures to ensure the safety of people in the surrounding area. Where the public could be exposed to danger by any of the Works or Site activities, the Contractor shall, as appropriate, provide suitable flagmen, barriers and/or warning signs in English, Afrikaans and Sotho, all to the approval of the Project Manager. All unattended open excavations shall be demarcated (fencing shall consist of a minimum of three strands or wire and made clearly visible). Storage areas shall display the required safety signs depicting "No smoking", "No naked lights" and "Danger". Containers shall be clearly marked to indicate contents as well as safety requirements. First aid services must be provided by the contractor at the contractor's camp. Involve the local Community Policing Forums or other security association. 	<ul style="list-style-type: none"> Intact fencing to secure mining areas. Public complaints register. Monitoring reports. 	<ul style="list-style-type: none"> Daily 	<ul style="list-style-type: none"> OHSA and associated Construction Regulations of 2014. 	Construction	<ul style="list-style-type: none"> Contractor 	Part of EM audits.
	<ul style="list-style-type: none"> Security 	<ul style="list-style-type: none"> Increasing crime rate 	<ul style="list-style-type: none"> The safety and security of the public and landowners is of paramount importance and must not be compromised by the activities associated with the project 	<ul style="list-style-type: none"> Security policy Total number of security complaints and corrective actions taken. No crime attributable to the project. 	<ul style="list-style-type: none"> Ensure compliance with landowners biosecurity protocols in relation to the borrow pits on the related properties. Work within the parameters of existing landowner security measures that will ensure the safety of landowners, their properties and their assets. Ensure management of the labour force to prevent security-related issues or disturbance to landowners and community member. A security policy shall be developed which amongst others requires that permission be obtained prior to entering any property and provisions controlling trespassing by contractor staff. Only security staff shall be allowed to reside at contractor camps. General labour is expected to reside at approved accommodation or compounds. Contractors should establish crime awareness programmes at their site camps. 	<ul style="list-style-type: none"> Public complaints register 	<ul style="list-style-type: none"> Daily 	<ul style="list-style-type: none"> SAPS 	<ul style="list-style-type: none"> Construction 	<ul style="list-style-type: none"> Constructor 	<ul style="list-style-type: none"> Safety and EMPr audits

ID	Aspect	Potential Risk and Impact	Objectives	Performance Indicators and Targets	Mitigation measure / Procedure	Monitoring Methods	Monitoring Frequency	Applicable Standards or practices	Time period for implementation	Implementation Responsibility	Mechanism for Monitoring Compliance
2. Management of Access and Traffic	<ul style="list-style-type: none"> Increase in vehicle movement in the area 	<ul style="list-style-type: none"> Nuisance. Increase in potential vehicle accidents. Potential increase in pedestrian and livestock accidents. Decrease in the surface quality of roads. The development of potholes. Damage to vehicles 	<ul style="list-style-type: none"> Accidents are kept to a minimum. The surface quality of the road is not negatively impacted on by the construction activities. The presence of construction activities and vehicles is continually clearly indicated thereby minimising the potential for accidents. Sections of existing road surfaces which have been impacted on by the construction activities are remediated. 	<ul style="list-style-type: none"> No incidents of reported vehicle, pedestrian and livestock accidents. Condition of road surface maintained. Total number of complaints from surrounding landowners or road users and action taken Clear visibility of warning signage. Existing road surfaces are utilised and maintained within the baseline levels 	<ul style="list-style-type: none"> Undertake negotiations and confirm arrangements with the private landowners regarding the use of private roads and associated traffic arrangements. Selective upgrade of the relevant access roads to ensure that they can accommodate the type of vehicles and/or mechanical plant using these roads. Obtain the necessary approvals from the Roads Agency Limpopo (RAL) and any other Roads Authority, as required. The responsibility for obtaining wayleaves prior to construction within the road reserve shall rest with the contractor. Use existing access roads where present. Temporary access roads constructed are to be rehabilitated. Ensure temporary accommodation of traffic where any public or private roads are to be affected by construction/mining activities. Make provision for community members to access their properties safely. Ensure that, at all times, people have access to their properties as well as to social facilities such as schools, churches, transport, shops, etc. Strict adherence to speed limits by construction vehicles on the public and private access roads. Speed limits need to be posted on all access roads (especially on gravel roads where typically no speed signs are posted) according to the geometric design and limitations of heavy vehicles. Movement of vehicles at night is to be restricted to limit the risk of collisions with faunal species. Such movement restriction will also help mitigate the increased risk of poaching at night as vehicles moving along the roads will be more noticeable. The access roads need to provide sufficient width for heavy vehicles to navigate around curves in the road but also to prevent vehicles from driving off road and unnecessarily damaging adjacent habitat. This applies in particular to the district roads, which should be cleared of encroaching vegetation and a minimum 8m cross-sectional width maintained throughout the contract. Ensure traffic safety measures are implemented to make provision for blind rises and sharp bends on relevant roads to be used by construction vehicles. A traffic control Method Statement is required in this regard. The payloads delivered by heavy vehicles need to be recorded and audited to prevent overloading of heavy vehicles. Abnormal load permits must be acquired for the transport of abnormal loads. Traffic accommodation to South-African Road Traffic 	<ul style="list-style-type: none"> Site monitoring 	<ul style="list-style-type: none"> Weekly 	<ul style="list-style-type: none"> South African Road Traffic Act National Road Traffic Regulations (2000) 	<ul style="list-style-type: none"> Pre-construction surveys and construction monitoring. Rehabilitation phase will deal with rehabilitation of damages to utilised roads. 	<ul style="list-style-type: none"> Contractor and Engineer 	<ul style="list-style-type: none"> Part of EM audits

					<p>Signs Manual standards where any construction affects an existing road.</p> <ul style="list-style-type: none"> • Time restrictions for delivery vehicles through built-up and socially sensitive areas. • This applies in particular to roads that have schools adjacent to them (e.g., D769). If school patrols are not operational in the area, the necessary arrangements should be made prior to the construction work commencing. • Areas such as Thabazimbi have high pedestrian and public transport activity alongside the road (R510). Construction vehicles should be restricted from travelling through these areas at night unless there is sufficient street lighting or additional lighting is provided. Signage relating to construction activity and the presence of pedestrians should be provided. • Access control is to be maintained to prevent livestock from accessing construction/mining areas. • Delivery routes should be defined and adhered to. • Ensure that the local roads used by the contractor are left in the same or better condition than they were prior to the start of construction. • Match the alignment and construction method of new access roads to the topography and to the surrounding farm roads or tracks. • Where practically feasible locate access roads away from visual assets such as wetlands, ridges and koppies • Access roads shall not cross over the crest of elevated landforms such as koppies and ridges and run parallel to and around the outline of the foot slopes. • When selecting haul routes, those roads with sufficient over-taking opportunities should be preferred, to prevent driver frustration (especially from the local community who use these roads on a daily basis) when driving behind slow-moving vehicles. • All kilometre route markers along the gravel roads should be exposed and the vegetation surrounding them cleared at the start of the project. This is to ensure that should there be an incident, the correct location can be easily identified. • Dust suppression should be conducted at regular intervals using a water tanker. Dust suppression additives may be considered. This process needs to be managed by the EO. • Temporary turning lanes should be considered at intersections where there is a large speed differential between the main road and the side road, e.g., R-routes. 						
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3. Management of Visual	<ul style="list-style-type: none"> Changing the aesthetic quality of the environment 	<ul style="list-style-type: none"> Scarring of landscape. Infestation of alien invasive species because of ecological disturbances. Spread of litter. Light pollution Negative effect on sense of place of the surrounding area. 	<ul style="list-style-type: none"> The disruption of the natural and existing landscape characteristics is limited. 	<ul style="list-style-type: none"> Total number of complaints and action taken Low level lighting/limited mounting height of lights Colouring and avoidance of smooth concrete surface in specific locations. Main Infrastructure such as rip rap stones, access roads, rock cutting, edges of BPT, steel roofs needs to blend in with existing environment 	<ul style="list-style-type: none"> To reduce visual intrusion, fences must be of a robust mesh type. Shiny galvanized or white coloured fencing must be avoided for permanent security fencing around infrastructure areas. Where practically feasible the security fence must be offset between any roads or farmstead boundary and a green buffer zone must be kept in place to shield receptors from both the infrastructure and the security fencing. Where spoil sites and construction camps are located adjacent to a road, a 10m natural vegetation visual buffer strip must be maintained between the road and the spoil site or construction camp. Positioning of the storage and lay-down areas should aim to minimise visual impacts. Advertising and lighting will be in accordance with relevant standards. Lighting will be sufficient to ensure security but will not constitute 'light pollution' to the surrounding areas. The site will be shielded / screened through maintaining the natural vegetation to minimise the visual impact, where practicable. On-going housekeeping to maintain a tidy construction area. Temporary construction signs and barricading must be removed as soon as the particular activity or set of activities are complete and in accordance with health and safety requirements. Camouflage netting to be draped over stockpile areas and temporarily secured with pegs where stockpiles are situated next to main roads or close to homesteads and within view of tourist accommodation. All temporary buildings or office containers must fit into the surroundings through the appropriate use of colour such as shades of dark olive, khaki brown or a grey, brown colour. The use of highly reflective material should be avoided, and any metal surface should be painted to fit into the surrounding environment in a colour that blends in effectively with the background. White structures to be avoided as these will form a significant contrast with the natural surroundings. Construction/mining activities should be restricted to daylight hours, to limit the need to bright floodlighting and the potential for sky glow. The Contractor shall not deface, paint, damage or mark any natural feature (e.g. rocks, etc.) situated on or around the site for survey or any other purposes unless agreed beforehand with the stakeholders. Any features affected by the Contractor in contravention to the above shall be rehabilitated / restored to the satisfaction of the stakeholder. To ensure a more unified and neat appearance, the permanent security fence at surface infrastructure areas should be approved by Engineer. Low level lighting or limit mounting heights of lighting fixtures by utilising footlight or bollard level lights. The use of high light masts and high pole top security lighting should be avoided 	<ul style="list-style-type: none"> Site monitoring and regular follow-ups on complaints received. 	<ul style="list-style-type: none"> Daily 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Construction 	<ul style="list-style-type: none"> Contractor and Engineer 	<ul style="list-style-type: none"> EM audits

					<p>along the security fence of infrastructure areas Any high-level masts should be covered to reduce glow and light spillage.</p> <ul style="list-style-type: none">• All buildings must have "full cut off" light fixtures that direct light only below the horizontal• Use low pressure sodium lamps, yellow LED lighting, or equivalent to reduce sky glow. (Bluish white lighting is more likely to cause glare).• Make use of motion detectors on security lighting at office and workshop areas.• Stone used for rip rap areas must blend into the adjacent natural environment, specific attention must be given to colour, shape, and size.• Vehicle mounted lights or portable lights are preferred over mounted lighting for night time maintenance activities.• All painted surfaces on buildings must be maintained on a regular basis to ensure deterioration of the infrastructure does not occur, in turn affecting the aesthetics of the area.• An exposed aggregate finish using natural quartzite stone from the area shall be used, (where practically feasible) in blending retaining walls and other in situ concrete works into the surrounding area to soften the appearance.• Where re vegetation occurs trees and shrubs must be planted in clumps, (mimicking natural vegetation openings) and not in rows or other geometric shapes.• Where cutting into rock occur, exposed rock faces must be colour treated and, if required, texturized to match those of the adjacent rock surface. Sample colour and texture must be approved by the Engineer.• Where surfaces on buildings are painted it should be darker colours such as khaki brown, grey brown or olive green.• Steel roof sheets must be a dark colour such as khaki brown, grey brown or olive green, bright and light colours like red, blue and orange must be avoided.						
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4. Management of Terrestrial Ecosystem	<ul style="list-style-type: none"> Loss of Vegetation, Habitat and Soil Fertility 	<ul style="list-style-type: none"> Decrease in faunal diversity and density. Decrease in floral diversity. Increased potential for erosion and soil loss. Increase in dust emissions. Potential decrease in soil organisms. 	<ul style="list-style-type: none"> To minimise the extent of the contractors camp, construction footprint borrows pit and spoil storage footprint, as well as remain outside of sensitive areas. 	<ul style="list-style-type: none"> Contractor's camp and construction/mining works kept within confines of demarcated footprint. All the sensitive or protected flora identified to be rescued and relocated from site. No accommodation on site. 	<ul style="list-style-type: none"> Search, rescue and relocation of red data, protected and endangered flora species affected by construction. Seasonality must conform to activity period of animal with reference to herpetofauna. During the monitoring of the mining areas, any non-listed alien vegetation must be checked to ensure they do not become problematic. The planning and design for the construction camps and construction/mining site must ensure that there is a minimum impact on the environment. These areas must be kept to a minimum footprint size. A site plan of the construction camp must be provided and approved by the Engineer. As far as possible the construction camp must be placed on already disturbed land. The working mining area must be reduced in sensitive environments such as pristine or valuable vegetation as well as sensitive social environments. A nursery must be established at the Construction Camp. Protected flora species must be removed and kept in the nursery during construction to be used for the rehabilitation of the disturbed areas. The contractor's camp and construction sites must be demarcated using fencing as approved by the Engineer. Fences must be constructed so as to avoid significant vegetation, natural features, and sites of cultural and historical significance. Limit clearing for fencing to the removal of trees and shrubs within 1m of the fence line. No removal of the grass cover or topsoil is to occur within this width. Site demarcations must remain in position until the completion of mining activities. Once the site has been cleared of vegetation (i.e. trees and shrubs), the topsoil including the existing grass cover is to be ripped before removal. All grass and other vegetation should be left on the topsoil stockpiles so that they colonise the area after construction. Plants outside of the construction area are not to be disturbed, destroyed or removed. The Contractor will be held liable for the replacement of any plant or feature under the protection of local by-laws, provincial ordinances or national legislation that is removed or damaged by the Contractors negligence or mismanagement. The Engineer is to indicate the plants or features to be avoided. The Contractor with the assistance of a qualified botanist should familiarise themselves with the protected, orange listed, range restricted or endemic species. Protected or endangered species of plants shall not be removed unless they are interfering with the construction/mining area. Where such species have to be removed, the necessary permission and permits shall be obtained from Provincial Nature 	<ul style="list-style-type: none"> Site monitoring 	<ul style="list-style-type: none"> Daily 	<ul style="list-style-type: none"> National Environmental Management : Biodiversity Act (NEMBA) National Forest Authority, National Veld and Forest Fire Act, No. 101 of 1998 and LEMA. Conservation of Agricultural Resources Act, No. 43 of 1983 and GN No. R. 598 (Alien and Invasive Species Regulations, 2014) 	<ul style="list-style-type: none"> Pre-construction (for search and rescue of protected species), construction, rehabilitation and demobilisation by the contractor 	<ul style="list-style-type: none"> Engineer and contractor 	<ul style="list-style-type: none"> Reporting and auditing

					<p>Conservation or DFFE.</p> <ul style="list-style-type: none"> • All protected species not removed must be clearly marked and such areas fenced off for the duration of the construction/mining works. • A certified horticulturist should be employed to supervise the transplantation process and to oversee the nursery. • A management plan must be compiled for nursery operations to ensure the persistence of "rescued" plant specimens. • The EM should keep a database (approximate number, identity and geographic position) of all of the protected and endangered plant species lost during the construction/mining phase. • The number of endemic and/or protected individuals removed during the construction phase should be replaced during rehabilitation. • All endemic or protected species rescued from the construction site must be maintained in the onsite nursery. Alternatively seeds of the species should be harvested in a 5 km radius prior to construction and then cultivated in the onsite nursery. • Endemic or protected species which are commercially available should be sourced from nurseries within a 50km radius. • Any 'remarkable tree' (species older than 200 years or taller than 10 m) should be left in situ or relocated. • Should any 'remarkable trees' be relocated, a tree surgeon must be appointed. • The removal of harvesting of plant species for medicinal or cultural use by an employee is strictly prohibited. • Planning of access routes must be done in conjunction between the Contractor, Engineer, ECO, TCTA and the relevant landowners. • Slight deviations of the access road alignments are permitted, so as to avoid significant vegetation specimens and communities, natural features and sites of cultural and historical significance. • Any additional routes and turning areas required by the Contractor must be approved by the Engineer. • No vegetation clearing in the form of de-stumping, scalping or uprooting shall be allowed on river- and stream banks, unless authorised by the Engineer. • Do not disturb, deface, destroy or remove plants or natural features outside of the construction area, whether fenced or not, for the duration of the Contractors presence on site, unless otherwise specified. • Do not establish any Site Works besides those specified and allowed for in the successful tender. • Do not paint or mark any natural feature. Marking for surveying and other purposes must be done using pegs, beacons, rope or droppers. • For significant trees as indicated by the Engineer or appointed specialists, trenching must occur 3 m away from the stem. • The footprint area of all proposed infrastructure should be limited to what is necessary. Disturbance to the surrounding natural habitat should be kept to a minimal. • It must be ensured that, as far as possible, all proposed 						
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					<p>infrastructure, including temporary infrastructure, is placed outside of sensitive habitat units (i.e., rocky outcrops and watercourses with associated zones of regulation as described within the Freshwater Ecological Assessment and Management Plan - SAS 220114, 2021).</p> <ul style="list-style-type: none"> • Access roads should be kept to existing roads, where possible, to reduce fragmentation of existing natural habitat. • It is recommended that prior to the commencement of construction activities that the entire construction servitude, including lay down areas and stockpile areas etc., be fenced off and clearly demarcated. All areas of increased ecological sensitivity outside of the authorised footprint must be designated as "No-Go" areas and be off limits to all unauthorised construction vehicles and personnel. 						
	<ul style="list-style-type: none"> • Illegal wood harvesting for creation of fires 	<ul style="list-style-type: none"> • Loss of indigenous woody vegetation. • Decrease in habitat for fauna and avifauna. • Increased potential for erosion. • Possible loss of protected species. 	<ul style="list-style-type: none"> • Unnecessary harvesting of wood from the surrounding area is prevented. 	<ul style="list-style-type: none"> • No visual evidence of wood harvesting. • No change to vegetation baseline. 	<ul style="list-style-type: none"> • After consultation with the community, woody material removed during construction must be placed in a designated area for collection by the local community. • No vegetative matter, besides the woody material mentioned above, may be removed for firewood. 	<ul style="list-style-type: none"> • Site monitoring 	<ul style="list-style-type: none"> • Daily 	<ul style="list-style-type: none"> • NEMBA 	<ul style="list-style-type: none"> • Pre-construction, construction, rehabilitation and rehabilitation phase 	<ul style="list-style-type: none"> • Engineer and contractor 	<ul style="list-style-type: none"> • Reporting and auditing

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	<ul style="list-style-type: none"> Soil contamination 	<ul style="list-style-type: none"> Decline in soil organisms. Potential sterilisation in the carrying capacity of the soil. 	<ul style="list-style-type: none"> Protection of soil and soil remediation measures in case of spills is ensured. 	<ul style="list-style-type: none"> No evidence of hydrocarbon and hazardous spills. No release of contaminated water into the natural environment. Immediate removal and remediation of all spills. 	<ul style="list-style-type: none"> Fuel must be stored in above ground storage tanks or sealed containers – both such vessels being contained within a bunded area with sump drainage. All bunds must be designed to contain at least 110 % of the tank or drum storage capacity (this shall include fuels for, welding equipment and oxy – acetylene cutting equipment). No drainage from fuel storage areas shall be permitted. Response plans must be prepared by Contractors to ensure the fastest possible reaction to spills or accidents. These plans must include rehabilitation procedures. All spills (minor and major) must be cleaned and remediated to the satisfaction of the EM within 24 hours of occurrence. Any spillage on site will be excavated to the visible depth of impact and disposed of for removal to a registered hazardous waste disposal site. Excavated areas are to be refilled with suitable material. Alternative in-situ remediation techniques could be used if approved by the Engineer and EM. The contractor must ensure that there is a supply of absorbent material and clean-up materials readily available to absorb, breakdown and, where possible, encapsulate minor material spillages. Where possible and practical all maintenance of vehicles and equipment shall take place in the workshop area. Should emergency repairs be necessary, metal drip trays or tarpaulins must be utilised to ensure the collection of the oil. The area for emergency repairs should be identified between the Contractor and Engineer. Vehicles and equipment must be checked on a daily basis. Checklists for all vehicles and plant must be kept as a record. Workshop areas shall have a concrete floor and fitted with sumps and collection tanks for wastewater that is contaminated with oil, diesel and petrol. Metal drip trays or any form of oil absorbent material must be placed underneath vehicles and equipment when not in use. Metal drip trays must be used where dispensing mechanisms or stored receptacles may leak. All vehicles and equipment must be well maintained to ensure that there are no oil and fuel leakages. Leaking equipment shall be repaired and immediately removed from site to a facility for repair. Site establishment shall take place in orderly manner and all amenities shall be installed at the camp sites before the main workforce move onto site. No permanent structures will be permitted at the contractor's camp. Storage areas and material laydown sites must be located within a pre-determined zone and should be indicated on the site plan. Additional laydown and storage areas required must be approved by the Engineer. Temporary structures shall be placed in a predetermined area and be founded on a platform, of either subsoil or screed slab. Vehicles, plant and equipment may only be washed in designated areas. Cement must be delivered in sound and properly secured bags or in approved bulk containers. Cement products in bags must be stored in storage containers to be provided at the construction camp and should only be opened when needed. Limit cement and concrete mixing to single sites where possible. 	<ul style="list-style-type: none"> Site monitoring 	<ul style="list-style-type: none"> Daily 	<ul style="list-style-type: none"> Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) 	<ul style="list-style-type: none"> Pre-construction, construction, rehabilitation and demobilisation phase 	<ul style="list-style-type: none"> Engineer and contractor 	<ul style="list-style-type: none"> Reporting and auditing

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					<ul style="list-style-type: none"> No concrete batching on bare soil. Dispose of all visible remains of excess cement and concrete after the completion of tasks. Do not allow the washing of trucks delivering concrete anywhere but within designated wash bays equipped with runoff containment. Any spilled concrete shall be cleaned up immediately. The siting of batching plants shall be done in consultation with the ecologist and the archaeologist. Avoid stripping borrow pit areas to bedrock as it limits the rehabilitation potential for these areas. 						
	<ul style="list-style-type: none"> Increased potential for soil erosion 	<ul style="list-style-type: none"> Loss of valuable topsoil. Loss of vegetation. 	<ul style="list-style-type: none"> To prevent any erosion and to provide erosion control measures where required. 	<ul style="list-style-type: none"> No visible evidence of erosion activity. Sedimentation loads of streams and rivers do not exceed baseline levels by more than 10 %. Erosion control measures present in all higher risk areas. 	<ul style="list-style-type: none"> Once the site has been cleared of vegetation (i.e. trees and shrubs), the topsoil including the existing grass cover is to be stripped from the boundaries of working areas inward where topsoil will be impacted by construction/mining activities, including areas for temporary facilities, as directed by the Engineer. The soil profile as obtained from the test pits conducted by the Contractor shall be investigated per chainage to ascertain the depth of the fertile soil. A Record of the stripping depth in each area will be kept for reference during rehabilitation. Topsoil must only be handled twice, once to strip and stockpile and once to replace and level. Topsoil must be stripped in as dry condition as possible in order to prevent compaction. Topsoil shall be stripped over the entire width of the borrow pit areas, except for the topsoil storage area, and to a maximum depth of 150 mm. Topsoil stockpiles may not become contaminated with oil, diesel, petrol, garbage or any other material, which may inhibit the later growth of vegetation. The Contractor will be held liable for the replacement of any topsoil rendered unsuitable for use during rehabilitation. This topsoil will be sourced from commercial sources. Do not mix topsoil obtained from different sites. Do not mix sub-soil and topsoil stockpiles. Once the site has been cleared of vegetation (i.e., trees and shrubs), topsoil shall be replaced as soon as possible. Topsoil stored for longer than two weeks should be covered with tarpaulins to prevent waterlogging. Where practical, topsoil and fertile soil shall not be left for longer than six months before being used for rehabilitation. The topsoil stockpiles must not exceed 2m in height, unless otherwise approved by the Engineer. Topsoil stockpiles must be above the 1:50 year flood line. Stockpile topsoil in windrows parallel to the excavation. Do not stockpile topsoil in drainage lines. The stockpiles shall be formed such that no ponding of surface water forms on the surface of the stockpile. Erosion of the topsoil stockpiles by wind and/or water shall be minimised by providing suitable storm water and cut off drains, and by establishing temporary vegetation on the stockpiles The contractor shall apply soil conservation measures to the stockpiles to prevent erosion. This could include the use of erosion control fabric or grass seeding. Identify all areas susceptible to erosion so that these can be protected from undue soil erosion resultant from activities within and adjacent to the construction camp and Work Areas. Retain natural trees, shrubbery and grass species wherever possible. 	<ul style="list-style-type: none"> Site monitoring 	<ul style="list-style-type: none"> Daily 	<ul style="list-style-type: none"> Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) and contract specification 	<ul style="list-style-type: none"> Pre-construction, construction, rehabilitation and demobilisation phase 	<ul style="list-style-type: none"> Engineer and contractor 	<ul style="list-style-type: none"> Reporting and auditing

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					<ul style="list-style-type: none"> Do not let erosion develop beyond the formation of rills. Repair all erosion damage as soon as possible and not later than a target specified by the Engineer. Slopes steeper than 1(V):5(H) or slopes where the soils are by nature dispersive or erodible must be stabilised. Dust and erosion of topsoil from runoff must be minimised through watering or similar dust control measures. Placing of topsoil in areas exposed to high wind or excessively rainy conditions must be avoided. The contractor shall devise a soil conservation and stockpiling plan, to be approved by the Engineer. Where berms are installed on severe slopes the outflow shall be suitably stone pitched to prevent erosion from starting on berms. Wherever possible, access routes should not traverse drainage lines and riparian zones. Drainage lines are not to be altered and these areas should be level with the surrounding land once subsidence has occurred. Construction must include design measures that allow surface and subsurface movement of water along drainage lines so as not to impede natural surface and subsurface flows. Drainage measures must promote the dissipation of storm water run-off Runoff from roads must be managed to avoid erosion and pollution problems. Minimise the flow of any surface water or floodwater into borrow areas. Deflect clean surface runoff away from excavations. 						
	<ul style="list-style-type: none"> Encroachment and establishment of weeds 	<ul style="list-style-type: none"> Decrease in indigenous floral habitat availability. Decrease in floral populations and diversity. Spread of weeds to other environments. 	<ul style="list-style-type: none"> Alien plants / seeds are prevented from being introduced on site and spreading to surrounding areas. Alien plants are eradicated and removed from site. 	<ul style="list-style-type: none"> No visible presence of weeds on site. 	<ul style="list-style-type: none"> Weeds growing on topsoil stockpiles must be removed. All sites disturbed by construction activities must be monitored for exotic or invasive plant species and weeds. Herbicides and pesticides may only be used during vegetation clearance and the eradication of alien plant species with the prior approval of the ECO. If necessary, a method statement shall be submitted for approval. Chemical removal shall be used in accordance with manufacturer's specification for weeds where mechanical eradication / control is no longer effective. Those exotic / invasive plant or weed which cannot be eradicated by means of herbicides, need to be manually removed from site. The herbicide consultant must have a Pest Control Operators license. The Contractor must consult a flora specialist or the herbicide consultant in developing a brochure for those eradicating weeds which identifies declared weeds and alien species that can be totally eradicated. Control the type of material imported to site to ensure that soil contamination, in terms of weed and alien invasive plants, does not occur. 	<ul style="list-style-type: none"> Site monitoring 	<ul style="list-style-type: none"> Daily 	<ul style="list-style-type: none"> NEMBA Conservation of Agricultural Resources Act, No. 43 of 1983 and GN No. R. 598 (Alien and Invasive Species Regulations, 2014) 	<ul style="list-style-type: none"> Preconstruction construction, rehabilitation phase 	<ul style="list-style-type: none"> Engineer and contractor 	<ul style="list-style-type: none"> Reporting and auditing

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	<ul style="list-style-type: none"> Loss of Fauna Habitat 	<ul style="list-style-type: none"> Decrease in faunal diversity. Decrease in faunal diversity. Obstruction to faunal migratory patterns. Potential decrease in faunal populations. Potential injury and death to fauna. 	<ul style="list-style-type: none"> Ensure the protection of animals (including wildlife and livestock). Adhere to agreements made with landowners and community members regarding animals. 	<ul style="list-style-type: none"> Total number of incidences of violation involving indigenous fauna and action taken Unpermitted disturbance to protected flora species. No direct / indirect harm to animals from construction activities No visible impediment of faunal corridors. Trenches are not left open for long distances at a time. All fences removed at completion of construction work. No illegal hunting or poaching of fauna. 	<ul style="list-style-type: none"> Search, rescue and relocation of red data, protected and endangered faunal species affected by construction/mining. Stringent and dedicated control of poaching. All wildlife must be protected, with snaring or hunting strictly prohibited with stated consequences and penalties enforced. Unauthorised use of natural resources from adjacent properties must be avoided and strictly enforced. No fishing allowed. No wilful harm to any animals, unless a direct threat is posed to a worker's health or safety. Captured animals to be safely released to a similar habitat in the surrounding area but outside of disturbance footprint. Prepare emergency response procedure for dealing with snake bites, as venomous species may occur in the area. Photographs of protected and sensitive fauna species must be displayed in the construction camp to heighten awareness. If any herpetological species (including the Southern African Python, Giant Bullfrog and African Bullfrog) are encountered or exposed during the construction/mining phase, they should be removed and relocated to suitable natural areas. This remedial action requires the employment of a herpetologist and or ecologist to oversee the removal of any herpetofauna. Aestivating Bullfrogs need to be carefully reburied in a suitable location and substrate similar to that of where they were removed so as to maximise the rate of survivability. If any arachnid species are encountered, especially burrowing species or species which are often found living under rocks and fallen tree / logs, they are to be safely removed from the disturbance footprint and released in suitable similar habitat in the surrounding area. Use of pesticides / insecticides is prohibited. Training of construction workers to recognise threatened animal species will reduce the probability of fauna being harmed unnecessarily. The contractor must ensure that no faunal species are disturbed, trapped, hunted or killed during the construction phase. No trapping or any other method of catching of any animal or bird may be performed on site. No dogs or other domestic pets should be allowed at the site. Comply with the requirements of the NEM:BA, LEMA and Animal Protection Act, No. 71 of 1962. 	<ul style="list-style-type: none"> Site monitoring 	<ul style="list-style-type: none"> Daily 	<ul style="list-style-type: none"> National Environmental Management : Biodiversity Act (NEMBA) National Forest Authority, National Veld and Forest Fire Act, No. 101 of 1998 and LEMA. Conservation of Agricultural Resources Act, No. 43 of 1983 and GN No. R. 598 (Alien and Invasive Species Regulations, 2014) 	<ul style="list-style-type: none"> Pre-construction (for search and rescue of protected species), construction, rehabilitation and demobilisation by the contractor 	<ul style="list-style-type: none"> Engineer and contractor 	<ul style="list-style-type: none"> Reporting and auditing

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					<p><u>Nests – Avoidance Feasible - Spatial Measures:</u></p> <ul style="list-style-type: none"> • Implement prescribed buffers that were based on best practice and/or specialist expertise: • Red-listed spp.: Minimum Core – 1 km; Preferred Outer 2.5 km • Non-red-listed spp.: Minimum Core – 200 m; Preferred Outer 1 km • Known sites identified during winter survey include: • Cape Vulture (Kranskop Colony, Marakele National Park) • Martial Eagle (Karoobult 126 LQ) • Verreaux's Eagle (Karoobult 126 LQ) • Secretarybird (Ruigtevley 97 KQ, Ptn. 5) • Wahlberg's Eagle (various locations along route) • African Hawk-Eagle (various locations along route) • Nests – Avoidance Feasible - Temporal Measures: • In addition to proactive seasonal avoidance measures initiated from the planning phase, construction will need to include an adaptive / dynamic management approach which includes reactive temporal measures to safeguard breeding by SCC avifauna. • If an active nest of an SCC avifaunal species is found within development corridor / footprint either by the specialist or the contractors, construction/mining should be halted for the duration of the nestling period. • In general, attempt to conduct the bulk of the earth-moving and high intensity impacts (e.g. excavation and blasting) during autumn through early winter (February-May). • Construction near Nests of resident SCC raptor species (e.g. Black Eagle, Verreaux's Eagle and Secretarybird) should avoid taking place from June to December (eggs laid in June-July, nestling period 2.5-4 months). • Construction near nests of SCC breeding migrants (e.g. Wahlberg's Eagle) should avoid taking place from August to January (egg laying peaks September- October, nestling period 2-3 months). <p><u>Nests – Avoidance Not-Feasible:</u></p> <ul style="list-style-type: none"> • Limiting sensory disturbance to avifauna • Avoid high intensity impacts e.g. blasting wherever possible within the buffer zones applied to nests and sensitive habitats • Minimise dust, noise and light pollution and excessive human activity in areas of high avifaunal sensitivity. • Do not place temporary construction camps, laydown areas or toilets in or within the buffers on areas of high avifaunal sensitivity. • Move construction as quickly and quietly as possible through these areas. 						

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					<ul style="list-style-type: none"> Avoid disruption of functional wildlife enterprises (including game farming operations, hunting and ecotourism activities). Plan construction/mining phases to select sections with cattle and wildlife farming enterprises during the winter months (May to September), with wildlife eco-tourism and hunting enterprises targeted for construction during the summer months (October to April) if possible and feasible within the constraints of the construction schedule and economy. Where this is not possible affected farmers / ranchers must be informed in writing of the proposed construction schedule to ensure pre-emptive action in mitigating impacts by cancellation of bookings or re-scheduling of planned land use activities 						
	<ul style="list-style-type: none"> Impede faunal movement and disrupt livelihood 	<ul style="list-style-type: none"> Decrease in faunal diversity. Obstruction to faunal migratory patterns. Potential decrease in faunal populations. Potential injury and death to fauna. 	<ul style="list-style-type: none"> All possible impacts on faunal movement are kept to a minimum. Consideration is given to faunal movements before demarcation of areas and trenching. 	<ul style="list-style-type: none"> No visible impediment of faunal corridors. Trenches are not left open for long distances at a time. All fences removed at completion of construction work. No hunting or poaching of fauna. 	<ul style="list-style-type: none"> All excavations must be demarcated using danger tape with steel droppers or other methods approved by the EM. The contractor must ensure that domesticated animals belonging to the local community are kept away from the construction site. The footprint of disturbance should be kept to a minimum. Trenches must be checked on a daily basis for any signs of fauna which may have fallen in. Access roads should be planned so that only minimum linear distances are developed. Maintain animal movement corridors as far as possible. No wild animal may under any circumstance be handled, removed or interfered with. No wild animal may under any circumstance be hunted, snared, captured, injured or killed. This includes animals perceived to be vermin. The Contractor must regularly undertake checks of the surrounding natural vegetation, in fences and along game paths to ensure no traps have been set. Remove and dispose of any snares or traps found on or adjacent to the site. Ensure that the Work site is kept clean, tidy and free of rubbish that would attract animal pests. Ensure that bins and waste storage facilities are scavenger proof. The Contractor must report problem animals and vermin to the Engineer who will facilitate any removal by the relevant organization or authority. Ensure that domesticated animals belonging to the local community are kept away and are safe from any unprotected Works. Do not make use of any pesticides, unless approved by the EM. Fences must be aligned to avoid the significant impact on animal movement corridors. The Contractor must communicate the benefits of the ecological conservation being practiced by the project and encourage active participation by all employees. 	<ul style="list-style-type: none"> Site monitoring 	<ul style="list-style-type: none"> Daily 	<ul style="list-style-type: none"> NEMBA 	<ul style="list-style-type: none"> Pre-construction, construction, rehabilitation and rehabilitation phase 	<ul style="list-style-type: none"> Engineer and contractor 	<ul style="list-style-type: none"> Reporting and auditing.

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5. Management of Hazardous substances	<ul style="list-style-type: none"> Spillages of hazardous waste Contamination of soil and/or water resources 	<ul style="list-style-type: none"> Potential negative effects to the wellbeing of fauna and flora. 	<ul style="list-style-type: none"> Hazardous spills are prevented and no incidents to human health and the environmental 	<ul style="list-style-type: none"> Immediate removal and remediation of all spills. All staff trained. All hazardous substances are documented. 	<p><u>Training</u></p> <ul style="list-style-type: none"> Ensure that all personnel that use or handle hazardous materials are trained in the use and potential dangers of the materials. Employees must be trained on emergency response procedures required to counter the nature and hazards of an accidental release; and Employees must be familiar with and have received the appropriate training regarding the handling and storage practices, for all containers with which they will come into contact. <p><u>Control planning</u></p> <ul style="list-style-type: none"> Document the types and amounts of hazardous materials present on the project site including the following information: <ul style="list-style-type: none"> Name and description (e.g. composition of a mixture) of the hazardous material; Classification (e.g. code, class or division) of the hazardous material; Regulatory reporting threshold quantity of the hazardous material. Quantity of hazardous material used per month. Characteristics that make the material hazardous (e.g. flammability, toxicity); Analysis of potential consequences based on the physical geographical characteristics of the site, including aspects such as its distance to settlements, water resources, and other environmentally sensitive areas. Identify locations of hazardous materials and associated activities on an emergency plan site map; Detail the availability of specific personal protective equipment and training needed to respond to an emergency; and Detail availability of spill response equipment sufficient to handle at least initial stages of a spill and a list of external resources for equipment and personnel, if necessary, to supplement internal resources. <p><u>Uncontrolled Releases and Spillages</u></p> <ul style="list-style-type: none"> Implement all measures detailed in the spill prevention method statement. Prevent uncontrolled releases of hazardous materials to the environment or uncontrolled reactions that might result in fire or explosion using engineering controls (containment, automatic alarms, and shut-off systems) commensurate with the nature of hazard. Implement management controls (procedures, inspections, communications, training, and drills) to address residual risks that have not been prevented or controlled through engineering measures. Store all hazardous (reactive, flammable, corrosive and toxic) materials in clearly identified, fit-for-purpose containers or vessels. Describe response activities in the event of a spill, release, or other chemical emergency including: <ul style="list-style-type: none"> Internal and external notification procedures. Specific responsibilities of individuals or groups. Decision process for assessing severity of the release and determining appropriate actions. Facility evacuation routes, and Post-event activities such as clean-up and disposal, incident investigation, employee re-entry, and restoration of spill response equipment. 	<ul style="list-style-type: none"> Site monitoring 	<ul style="list-style-type: none"> Daily 	<ul style="list-style-type: none"> Substances Act (Act No. 15 of 1973), the Occupational Health and Safety Act (No. 85 of 1993), relevant associated Regulations, and applicable SANS and international standards. 	<ul style="list-style-type: none"> Construction 	<ul style="list-style-type: none"> Contractor and Engineer 	<ul style="list-style-type: none"> Inspections of site conditions, waste management facilities and hazardous chemical storage facilities

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					<p><u>Reaction, fire and explosion prevention</u></p> <ul style="list-style-type: none"> • Reactive, flammable, and explosive materials must be managed to avoid uncontrolled reactions or conditions resulting in fire or explosion. Such prevention practices include: <ul style="list-style-type: none"> ○ Storage of incompatible materials (acids, bases, flammables, oxidizers, reactive chemicals) in separate areas, and with containment facilities separating material storage areas. ○ Provision of material-specific storage for extremely hazardous or reactive materials. ○ Use of flame arresting devices on vents from flammable storage containers. ○ Provision of grounding and lightning protection; and ○ Storage of hazardous materials in an area of the facility separated from the main construction activities. <p><u>Planning co-ordination</u></p> <ul style="list-style-type: none"> • Procedures should be prepared for: <ul style="list-style-type: none"> ○ Informing the public and emergency response agencies. ○ Documenting first aid and emergency medical treatment. ○ Taking emergency response actions. ○ Reviewing and updating the emergency response plan to reflect changes, and ensuring that employees are informed of such changes; and ○ Using, inspecting, testing, and maintaining the emergency response equipment. <p><u>Storage of hazardous materials</u></p> <ul style="list-style-type: none"> • Chemical products must be secured when not needed to prevent tampering and vandalism. • Provide warning notices, fire-fighting facilities and protection from weather damage. • Each shift supervisor or safety officer is to report on the integrity of the hazardous materials storage. • Keep products in their original container unless they are not re-sealable; with all stored products and containers being labelled, and original labels and Material Safety Data Sheets (MSDS) retained. • Store acetylene, propane, and oxygen cylinders in dedicated areas where they will be protected from collision or ignition sources. • Label containers so that the hazard nature of the material is clear. <p><u>Handling of hazardous materials</u></p> <ul style="list-style-type: none"> • Obtain MSDS for all chemicals before use and all materials must be handled according to the instructions. • In response to and in addition to the information contained on the MSDS the following must also be determined: <ul style="list-style-type: none"> ○ Location, or where the material is to be moved. ○ The weight of the container so that proper personnel and/or equipment will be utilized during handling. ○ Access and egress routes. ○ What personal protective equipment (PPE) is required. ○ What emergency actions may be needed (i.e., first aid, firefighting media, etc.); and ○ Containers holding flammable materials to be grounded during any transfers of contents. 						

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					<p><u>Transport of hazardous materials</u></p> <ul style="list-style-type: none"> Transporters of hazardous materials must ensure that: <ul style="list-style-type: none"> The vehicle is suitable and registered for the purpose it is being used; and The vehicle displays clear markings in English indicating the nature of the materials being carried, what to do in the event of an emergency, and an emergency telephone number (24 hour) of a responsible person who can provide advice in the event of an emergency. <p><u>Flammable liquids</u></p> <ul style="list-style-type: none"> No combustible material (e.g. wood, rags, carton boxes, etc.) are to be kept in the presence of flammable liquids. 'No Open Flames' and 'No Smoking' symbolic signs are to be displayed in the vicinity of the flammable liquid storage areas. Flammable liquids are to be issued only on a need-to-use-basis and strict control is to be exercised to ensure that persons do not draw more than what is needed for the specific job. All cables are to be grounded as appropriate. An adequate number (according to safety regulations) and type of firefighting equipment is to be available in the close vicinity of the flammable liquid store. Flammable liquid stores are to be well ventilated and free of explosive vapours. Flammable liquid containers in the flammable liquid stores are to be clearly marked / labelled as to their contents. They are to be provided with earthed metal drip trays. Locations are to support MSDS information and handling / storage instructions. Flammable liquid tanks are to be properly earthed in order to prevent static electricity accumulating. Drainage points on flammable liquid tanks are to be provided with threaded caps or blanking plates. Bund walls are to surround storage tanks containing flammable liquids and these must be able to contain the entire volume of the contents plus 10% in case of spillage. Earthing is to be tested regularly (according to safety regulations). 						
6 Management of Waste	Mismanagement of sewage	<ul style="list-style-type: none"> Unpleasant odours Potential outbreak of disease Infringement on human rights Spillages which could result in increase in microbiological pollutants to watercourses and soil. 	<ul style="list-style-type: none"> The required number of latrines are provided and emptied on a regular basis. 	<ul style="list-style-type: none"> The required number of chemical toilets Record of sewage waste disposal certificates. Water quality of streams and rivers are maintained within baseline levels. 	<ul style="list-style-type: none"> Toilets must be provided in the working area within 100 m from worker activity. Separate toilets must be provided for males and females. Chemical toilets must be emptied / serviced on a regular basis to prevent them overflowing. Proof of this must be provided to the EM. The Contractor shall inform all site staff to the use of supplied ablution facilities and under no circumstances shall indiscriminate excretion and urinating be allowed other than in supplied facilities. 	<ul style="list-style-type: none"> Site monitoring 	<ul style="list-style-type: none"> Daily 	<ul style="list-style-type: none"> National Environmental Management Act (NEMWA). National Water Act (NWA) 	<ul style="list-style-type: none"> Construction 	<ul style="list-style-type: none"> Contractor and Engineer 	<ul style="list-style-type: none"> Auditing of sewage related aspects on site.

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	Increase in waste generation.	<ul style="list-style-type: none"> • Illegal dumping resulting in soil and water resources contamination. • Over supply and wastage of materials on site through excessive ordering practices. • Potential for spillages of liquid chemical wastes in temporary storage. • Nuisance factor (litter, odours and aesthetics) • Decrease in the aesthetic quality of the environment. • Unpleasant odours. • Potential injury and death to local fauna and livestock. • Shortening the lifespan of the local waste disposal sites. • Potential disease and injury to site staff and local inhabitants. • Land surface pollution. 	<ul style="list-style-type: none"> • Re-use and recycling of waste is promoted where prevention thereof is not possible. • The disposal of waste to local waste disposal sites is limited. 	<ul style="list-style-type: none"> • No visible waste from construction activities observed on site. • No unpleasant odours. • Marked and sealable bins observed. • Evidence of waste disposal certificates. • Quantities of recycled material and disposed 	<ul style="list-style-type: none"> • The Contractor must ensure that the site is kept clean and free of rubbish that could potentially attract animal pests and that rubbish bins are scavenger proof. • The Contractor must dispose of all domestic refuse generated by the staff and sub-contractors at a registered waste disposal facility. Proof of this must be provided by the Contractor to the Engineer. • The Contractor will be responsible for the removal and transportation of all construction waste material off site to a registered waste disposal facility. Proof of this must be provided by the Contractor to the Engineer. Maintain a waste register for materials removed from the site, indicating type, quantity, date, haulage contractor, delivery point and safe disposal certificate. • The storage of general or hazardous waste in a waste storage facility must comply with the norms and standards in GN No. R. 926 of 29 November 2013. • Vermin / weatherproof bins shall be provided in sufficient numbers and capacity to store domestic waste. These bins must be kept closed to reduce odour build-up and emptied regularly to avoid overflowing and other associated nuisances. • Where possible, waste must be separated at source (e.g. containers for glass, paper, metals, plastics, organic waste and hazardous wastes). • Establish and monitor recycling targets. • Ensure suitable housekeeping. • The Contractor shall ensure that no burying, dumping or burning of waste materials, vegetation, litter or refuse occurs. All waste will be disposed of at suitable licensed disposal sites, based on the waste type (general versus hazardous). • Ensure that waste is transported so as to avoid waste spills en-route. • Separate disposal sites for hazardous waste. This must be on a bunded area compliant to hazardous waste disposal regulations. • During transportation of waste, the Contractor must comply with the codes of practice and guidelines for licensing of waste transport vehicles and the regulation and monitoring of transport operations. • Collect waste, concrete and cement sludge off the side of the batch plant on a regular basis and dispose of according to the Contractor's approved method statement. • Do not dump waste of any nature, or any foreign material into any drainage line or stream. • Characterise and quantify all waste streams across the project in terms of quantity, hazard, generation frequency and recyclability and define and implement disposal options approved by the Engineer. • As part of the characterisation define opportunities for source reduction, as well as reuse and recycling as opposed to simply disposing of waste. • Ensure segregation of hazardous wastes from non-hazardous. • Collect waste, concrete and cement sludge off the side of the batch plant on a regular basis and dispose of according to the Contractor's approved method statement. • Do not dump waste of any nature, or any foreign material into any drainage line or stream. • Clearly marked waste bins are to be provided for the separation of waste. 	<ul style="list-style-type: none"> • Public complaints register. • Waste register. • Recycling targets. • Disposal certificates. • Monitoring records 	<ul style="list-style-type: none"> • Weekly and Monthly 	<ul style="list-style-type: none"> • NEM:WA. Classification of types of waste must be referred to GN 634 of 2013 	<ul style="list-style-type: none"> • Construction 	<ul style="list-style-type: none"> • Throughout the duration of the construction period. 	<ul style="list-style-type: none"> • Engineer and ECO - to monitor compliance. • Contractor to implement management actions.

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					<ul style="list-style-type: none"> Recyclable waste, including glass, paper and plastic must be separated at the construction camp, stored and recycled where possible, for example waste oil should be recycled. The Contractor must do site clean-ups on a daily basis and dispose in the designated refuse bins provided. The Contractor must dispose of all domestic refuse generated by the staff and sub-contractors on a weekly basis at a registered waste disposal facility. Proof of this must be provided by the Contractor to the Engineer. Ensure that solid waste is transported so as to avoid waste spills en route. Sealable waste drums should be provided at least every 100m along the construction of the pipeline. Litter bins must be emptied on a weekly basis (or as required before they reach capacity). 						
7. Management of noise	Increased level of noise generation	<ul style="list-style-type: none"> Hearing loss through exposure to extended and or high noise levels. Disruption of sense of place due to noise nuisance. Disruption of daily activities due to noise disturbances. Noise nuisance to sensitive receptors 	<ul style="list-style-type: none"> Level of noise generation kept to a minimum. 	<ul style="list-style-type: none"> 1-hour LAeq noise levels at selected key receptor Threshold levels determined from detailed baseline monitoring. a. LAeq (equivalent continuous sound level) during daytime hours (07:00 to 22:00) = 55 dBA; b. LAeq during night-time hours (22:00 to 07:00) = 45 dBA; c. Comply with SANS 10103:2008. Blasting operations to be controlled to ensure sound pressure levels are kept below the generally accepted 'no damage' level of 140 decibels. 	<ul style="list-style-type: none"> Noise – The remote nature of the construction domain needs to be factored in to the mitigation of noise-related aspects. The provisions of SANS 10103:2008 will apply to all areas at the perimeter of the site, within audible distance of residents. Noise shall be monitored at the nearest sensitive receptor and where the noise is generated following a valid noise complaint (receptor within 100m). Install a noise meter near the entrance of Mooivallei Cave to monitor, manage and mitigate noise levels in the vicinity of this sensitive environment. Noise levels at this location should never exceed SANS 10103 limits. Construction/mining work should take place during working hours – defined as 06:00-17:00 from Monday to Saturday no work on Sundays. Should overtime work be required, that will generate noise or disruption to accessing properties and/or services, consultation with the affected community or landowner should take place. No amplified music will be allowed on the site. The use of radios, tape recorders, compact disc players, television sets etc. will not be permitted unless at a level that does not serve as an intrusion to adjacent land-owners. The Contractor will take preventative measures (e.g. screening, muffling, timing, pre-notification of affected parties) to minimise complaints regarding noise and vibration nuisances from sources such as power tools. Proper design and maintenance of silencers on diesel-powered equipment, systematic maintenance of all forms of equipment, training of personnel to adhere to operational procedures that reduce the occurrence and magnitude of individual noisy events. Where possible material stockpiles should be placed so as to protect site boundaries from noise from individual operations. If a stockpile is constructed, it should be at a position and of such a height as to effectively act as a barrier to site noise at any sensitive area, if line of sight calculations show this to be practicable. Environmental noise monitoring should be carried out at intervals for the construction/mining phase in order regularly to detect deviations from pre noise levels and enable corrective measures to be taken where warranted. Potentially sensitive receptors must be notified when night-time construction activities is to be undertaken within 500m. Include a component covering environmental noise in the Health and Safety Induction to sensitize all employees and contractors about this subject. 	<ul style="list-style-type: none"> Site monitoring. Complaints from surrounding landowners or users of the site 	<ul style="list-style-type: none"> Weekly 	<ul style="list-style-type: none"> National Noise Control Regulations SANS 10103:2008 	<ul style="list-style-type: none"> Construction 	<ul style="list-style-type: none"> Engineer and ECO - to monitor compliance. 	<ul style="list-style-type: none"> Contractor to implement management actions. Contractor to conduct environmental monitoring for noise

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					<ul style="list-style-type: none"> The Contractor shall take preventative measures (e.g. screening, muffling, timing, pre-notification of affected parties) to minimise complaints regarding noise and vibration nuisance from sources. 						
	Vibration	<ul style="list-style-type: none"> Change in habitats of subterranean fauna. Change in the breeding potential of subterranean fauna. Nuisance to surrounding landowners and communities. Formation of cracks and deterioration of existing buildings. 	<ul style="list-style-type: none"> Identified subterranean habits prior to blasting and compaction activities are considered. The effects of blasting and compaction activities are limited. 	<ul style="list-style-type: none"> Evidence of consultation with surrounding landowners and communities. Visible warning signs. Measures in place for controlled blasting. 	<ul style="list-style-type: none"> The Contractor shall take preventative measures (e.g. timing, pre-notification of affected parties, calculation of charge size, overseeing of correct stemming of blast holes) to minimise complaints regarding noise and vibration nuisance from sources. The Contractor will be held responsible for the damage to structures as result of blasting. Blasting Plan to be approved by the Engineer. The Contractor shall do a crack survey and prepare a photographic record of each structure, especially houses, buildings, ruins, etc., of the local communities within 250 m of any Works, whether on the surface or underground, prior to any blasting taking place. In populated areas, a representative sample of the closest dwellings shall be surveyed, and experienced building consultants employed if necessary. The Contractor shall also obtain a census of all boreholes within 250m and a yield test of water boreholes within 50m of a blast. A copy of the record, approved by the owner, shall be provided to the Engineer prior to any blasting taking place. Prohibit blasting (use non-explosive rock-breaking methods instead) to avoid impacting the bat cave's stability and avifauna nests. 	<ul style="list-style-type: none"> Site monitoring. Complaints from surrounding landowners or users of the site. 	<ul style="list-style-type: none"> Weekly 	<ul style="list-style-type: none"> USBM RI 8507 standard. Chapter 10 of the Federal Railroad Administration (FRA), 2012. 	<ul style="list-style-type: none"> Construction 	<ul style="list-style-type: none"> Engineer and ECO - to monitor compliance 	<ul style="list-style-type: none"> Contractor
8. Management of Water	Water contamination	<ul style="list-style-type: none"> Impact on the wellbeing and reproduction potential of the aquatic biota. Potential decrease in surface- and ground water quality. Potential decline in the use of water for activities on site. 	<ul style="list-style-type: none"> No pollutants are being released to the aquatic environments. Wastewater is appropriately managed. Erosion is prevented. Sedimentation is prevented. 	<ul style="list-style-type: none"> The quality of the water from upstream of construction and downstream of construction will not differ with more than 10%. No evidence of pollutants released into streams and rivers. 	<ul style="list-style-type: none"> The Contractor must identify sources of process water and quantify quantities for approval and monitoring by the Engineer. The Contractor shall supply a wastewater management system that will comply with legal requirements and be approved by the Engineer. Wash bays, service areas and fuel storage areas may not be located within the 1:100 year flood line or horizontal distance of 100 m (whichever is greater) of a watercourse or drainage line. No detergents may be used. Workshops, refuelling depots and washing areas shall be operated in such a way as to prevent contaminated water to run-off the site, polluting nearby streams or water bodies. Water from wash bays, service areas and fuel storage areas must be discharged into oil separators and sumps. Oils collected in this manner should be retained in a safe holding tank and removed from site by a specialist oil recycling company for disposal at approved waste disposal sites. No drainage from fuel storage areas shall be permitted. Never hose oil or fuel spills into storm water drain or sewer, or into the surrounding natural environment. Any contaminated storm water and other run-off from the site shall be contained and cleaned. Any spill which may contaminate water must be treated according to the approved spill management method statement the Contractor compiled. Contain oil or fuel spills in water using an approved oil absorbent fibre. Grey water not deemed suitable for dust suppression by the Engineer must be stored in sealable marked containers and disposed of with other wastewater. Wastewater as well as spilled fuel collected within bunded areas and refuelling areas shall be disposed of as hazardous waste. 	<ul style="list-style-type: none"> Site monitoring and water sampling and testing 	<ul style="list-style-type: none"> Daily 	<ul style="list-style-type: none"> General limits listed in the National Water Act (NWA) and the Classes and Resource Quality Objectives of Water Resources for the Mokolo, Matlabas Croc West and Marico GN of 42775 18 October 2019 	<ul style="list-style-type: none"> Construction until demobilisation by the contractor 	<ul style="list-style-type: none"> Engineer and contractor 	<ul style="list-style-type: none"> Reporting and auditing.

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					<ul style="list-style-type: none"> • The Contractor shall inform all site staff of the use of supplied ablution facilities and under no circumstances shall indiscriminate excretion and urinating be allowed other than in supplied facilities. • Drainage lines are not to be altered and these areas should be level with the surrounding land once subsidence has occurred. • Concrete trucks shall not be washed on site outside of designated concrete washbays. Such washbays must be constructed in such a manner to ensure adequate settlement of concrete from water and cleaning of such settled concrete from the washbay. The washbay must be bunded to prevent water from leaving the washbay and contaminating surrounding soil and/or waterbodies. • The process plant area shall be operated in such a way as to prevent contaminated water to run-off the site, polluting nearby streams or water bodies. To this effect diversion berms can be installed to direct all wastewater to a catchment area. Alternatively these areas shall be bunded to contain contaminated water. • Contain the contaminated run-off emanating from within the batch, crusher and sand washing plants within a sludge dam for later disposal in the appropriate manner. • Clean out all sludge dams on a regular basis and dispose of sludge in the appropriate manner. • Do not locate any site toilet, sanitary convenience, septic tank or French drain within the 1:100 year flood line, or within a horizontal distance of 100 m (whichever is greater) of stream or rivers. • Do not allow the use of any watercourse for swimming, bathing, or the cleaning of clothing, tools and equipment by any persons associated with the project. • Prevent the discharge of water containing polluting matter or visible suspended materials directly into drainage lines or streams. • Deflect any unpolluted water / runoff away from any dirty area. • Where necessary, turbid water pumped from excavations within rivers must be passed through a sand filter or settling pond before being releases back into the river. Ensure that no storm water is allowed to enter any drainage installation for the reception, conveyance, storage and or treatment of sewage. • Before any water is permitted to enter natural drainage lines, the quality of the water must comply with the standards contained within the General Authorisations of the DWS which has been authorised by DWS. • Ensure that water passing through vehicle wash bays and workshops pass through oil separators before passing into the conservancy tank. • Existing drifts and bridges may be used if the Landowner gives his consent. Such structures shall them be thoroughly examined for strength and durability before they are used. • New drifts and bridges shall only be constructed with the approval of TCTA. • A licence must be acquired from DWS for all water use crossings before construction starts. • During construction through a drainage line, the majority of the flow must be allowed to pass down the stream. In stream diversions should be used rather than the construction of new channels. • Erosion from the construction activities must be mitigated. Measures to control erosion include: <ul style="list-style-type: none"> ○ Minimising removal of vegetation; ○ Clearly demarcate boundaries in order to limit construction activities, 						

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					<ul style="list-style-type: none"> o Permanent or temporary fences shall be erected and maintained to ensure that activities are conducted within the demarcated area; o Erosion sensitive zones shall be clearly marked. No persons, machines, equipment or materials shall enter these areas; o Vehicles and plant to utilise dedicated routes only; and o Make use of erosion berms and silt fences where applicable and approved by the Engineer. 						
	Groundwater contamination	<ul style="list-style-type: none"> • Decrease in groundwater quality. • Decrease in the populations of aquatic micro-organisms. • Decrease in floral reproductively. 	<ul style="list-style-type: none"> • No contamination of groundwater. 	<ul style="list-style-type: none"> • No evidence of pollutants being released into groundwater. • Prevention of water contaminated through storm water attenuation works discharging into any storm water drain, river or stream. • Water quality and levels to remain within baseline ranges. • Report all hydrocarbon spillages. 	<ul style="list-style-type: none"> • No residue or substance which causes or is likely to cause pollution of a water resource may be placed in the workings of any underground or opencast excavation. • Monitor water supply sources for inorganic and microbiological quality components and implement treatment options if required. • Continue quarterly monitoring of strategic groundwater boreholes for groundwater levels and quality to assess impacts of the construction phase on the baseline groundwater quantity and quality of the area. • Investigate any changes in groundwater monitoring levels or quality from the baseline results and implement any corrective measures recommended as an outcome of the investigation. • Investigate claims or complaints from surrounding landowners on changes in groundwater levels or quality and implement any corrective or compensation measures recommended as an outcome of the investigation. • Prevent leakages from pipes or taps. • Water extraction sites should take note of the location of burial sites to prevent water contamination. • Establish a dedicated vehicle maintenance area and wash-bay, where suitable storm water management measures are in place to prevent pollution. • Water abstraction from boreholes or the river (by framers and for the project) and the construction of weirs in the river must not impact on ground water levels near or cause flooding to the Mooivallei Bat Cave. This could result in cave instability and collapse • Manage storm water from construction site to avoid environmental contamination and erosion. . Specific attention to be paid to erosion of in-situ burial sites. • Storm water runoff from workshops, vehicle maintenance area, wash-bay and other potential pollution sources shall be collected and treated in hydrocarbon separation pits / tanks before proper disposal. • All wastewater discharges to comply with legal requirements associated with the NWA, including the General Authorisation that specifically deals with S21 (f) and (g) water uses. • Wastewater discharges to form part of water monitoring programme. Water samples are to be analysed on a monthly basis in order to determine compliance to the aforementioned regulation. • Keep disturbance footprint to a minimum in areas underlain by sensitive aquifers. • Prevent hydrocarbon spills by maintain vehicles and the use of metal drip trays. Any hydrocarbon spills which do occur need to be cleaned up immediately and the contaminated material disposed of according to the hazardous waste management plan. • If there is a hydrocarbon spill, nearby boreholes must be sampled immediately for the full range of organic parameters. Sampling of organic parameters must continue on a monthly basis thereafter until the results are undetectable. If organic parameters remain undetectable after the spill, sampling must continue for a year to confirm no negative impacts where caused to the borehole. If a complaint or issue is raised thereafter sampling for organic parameters will need to resume until the results are undetectable. 	<ul style="list-style-type: none"> • Site monitoring 	<ul style="list-style-type: none"> • Daily 	<ul style="list-style-type: none"> • General limits listed in the National Water Act (NWA) and the Classes and Resource Quality Objectives of Water Resources for the Mokolo, Matlabas Croc West and Marico GN of 42775 18 October 2019 	<ul style="list-style-type: none"> • Construction until demobilisation by the contractor 	<ul style="list-style-type: none"> • Engineer and contractor 	<ul style="list-style-type: none"> • Reporting and auditing

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	Decline Water availability of water resource.	<ul style="list-style-type: none"> The decrease in the habitat for aquatic biota and riparian vegetation. Negative effect on the wellbeing of terrestrial fauna. Decrease in the effective functioning of the aquatic biota. Decrease availability of water for downstream users of the watercourse. 	<ul style="list-style-type: none"> Full compliance to the limits provided by DWA for abstraction volumes from a watercourse. 	<ul style="list-style-type: none"> Volume of water abstracted from the watercourse on an annual basis not to exceed the DWA Water Use License provisions by more than 5% on an annual basis. 	<ul style="list-style-type: none"> Water may only be abstracted from a watercourse for use during construction/mining once all grey water from batch, crusher and sand washing plants has been utilised on site for dust suppression. The volume of water abstracted from a watercourse may not exceed the limits stipulated by DWS. Boreholes selected for water supply need to be aquifer tested for a sustainable yield to which abstraction rates must comply. Groundwater levels from abstraction boreholes must be monitored on a monthly basis to ensure water levels don't drop below the pump position (damaging equipment). Do not drain, fill or alter in any way, any drainage line, including the riverbanks unless this forms part of the construction Works, or upon specific instruction by the Engineer and as authorised by the water use license. Monitor groundwater levels and quality in boreholes surrounding the development on a monthly basis during construction in the dolomite aquifers. 	<ul style="list-style-type: none"> Site monitoring 	<ul style="list-style-type: none"> Daily 	<ul style="list-style-type: none"> General limits listed in the National Water Act (NWA) and the Classes and Resource Quality Objectives of Water Resources for the Mokolo, Matlabas Croc West and Marico GN of 42775 18 October 2019 	<ul style="list-style-type: none"> Construction until demobilisation by the contractor 	<ul style="list-style-type: none"> Engineer and contractor 	<ul style="list-style-type: none"> Reporting and auditing
	Misuse of available water on site	<ul style="list-style-type: none"> Unsustainable utilisation of available wastewater resulting in increased abstracted volume of water from natural watercourses. The decrease in the habitat for aquatic biota and riparian vegetation. Decrease availability of water for downstream users of the watercourse. 	<ul style="list-style-type: none"> Wastewater generated from construction activities is as far as possible recycled for reuse. 	<ul style="list-style-type: none"> Abstraction from natural watercourses is kept to a minimum and does not exceed the DWA Water Use License provisions by more than 5% on an annual basis. Implementation, management and monitoring of storm water attenuation works, resulting in effective management of inter alia flooding and erosion. 	<ul style="list-style-type: none"> Monitor water use and ensure that areas of waste are identified and minimised. Repair identified leaks and address issues of water wastage as soon as these are identified. Where possible, reuse water on the construction/mining site for dust suppression on roads. Create awareness of water conservation in toolbox talks. 	<ul style="list-style-type: none"> Site monitoring 	<ul style="list-style-type: none"> Daily 	<ul style="list-style-type: none"> National Water Act (NWA) 	<ul style="list-style-type: none"> Construction until demobilisation by the contractor 	<ul style="list-style-type: none"> Engineer and contractor 	<ul style="list-style-type: none"> Reporting and auditing
9. Management of Air Quality	<ul style="list-style-type: none"> Dust Generation 	<ul style="list-style-type: none"> Negative effects on floral photosynthetic functioning. Potential increase in breathing ailments of site staff, surrounding landowners, communities and fauna. Decreased visibility. Nuisance. 	<ul style="list-style-type: none"> Dust emissions are kept to a minimum. Dust does not disturb the economic or social activities in the vicinity of the construction site. 	<ul style="list-style-type: none"> Total complaints and action taken regarding pollution. No measurable signs of pollution. Threshold levels determined from detailed baseline monitoring. <ul style="list-style-type: none"> a. Fence line sites = Industrial Band (600 to 1200 mg/m²/day); b. Community sites = Residential Band (< 600 mg/m²/day); c. Comply with ASTM D1739; SANS 1929, SANS 69. 	<ul style="list-style-type: none"> Dust – <ul style="list-style-type: none"> Appropriate dust suppression measures or temporary stabilising mechanisms to be used when dust generation is unavoidable (e.g. dampening with water, chemical soil binders, straw, brush packs, chipping), particularly during prolonged periods of dry weather. Dust suppression to be undertaken for all bare areas, including construction area, access roads, borrow pits, site yard, etc. Note that all dust suppression requirements should be based on the results from the dust monitoring and the proximity of construction activities to sensitive receptors. The Contractor will take preventative measures to minimise complaints regarding dust nuisances (e.g. screening, dust control, timing, and pre-notification of affected parties). Concentrated flows from dust suppression must be avoided and remediated from entering natural watercourses. Operators will be trained on best techniques (induction and toolbox talks) to handle materials in a manner that reduces dust generation such as reducing drop heights. 	<ul style="list-style-type: none"> ASTM D1739 reference method (dust fallout) and Continuous particulate monitoring PM10. 	<ul style="list-style-type: none"> Monthly 	<ul style="list-style-type: none"> National Environmental Management: Air Quality Act (NEMAQA) National Dust Control Regulations (GNR 827) 	<ul style="list-style-type: none"> Pre-construction, Construction and Rehabilitation 	<ul style="list-style-type: none"> Engineer and EM, Contractor 	<ul style="list-style-type: none"> Monthly air quality reporting will highlight any monitoring locations that exceed acceptable limits and suggest appropriate mitigation corrective measures.

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				Particulate matter (PM10) – 24 hr = 120 µg/m³ (more than four times a year); Annual = 50 µg/m³; Comply with the National Ambient Air Quality Standards	<ul style="list-style-type: none"> Material transporting vehicles will not be overloaded. Ensure minimum travel distance between working areas and stockpiles, where possible. Stockpiling activities will be restricted during high wind. Minimise travel speed on unpaved roads (20 km/h). Maintain access roads in order to limit exposed dust generating areas. All exposed surfaces must be minimised in terms of duration of exposure to wind through implementing concurrent rehabilitation. 						
	<ul style="list-style-type: none"> Unpleasant odours 	<ul style="list-style-type: none"> Nuisance to local communities and land users in close proximity to construction area 	<ul style="list-style-type: none"> No unpleasant odours are experienced on site 	<ul style="list-style-type: none"> All toilets are serviced. All putrescible waste removed and disposed of off-site. 	<ul style="list-style-type: none"> Putrescible waste must be handled, stored and disposed of before the probability of it generating odours. Chemical toilets must be emptied / serviced at a frequency as agreed between the Engineer and the Contractor and in accordance with health and safety standards. Proof of this must be provided to the Engineer. Sewage tanks must be emptied at a frequency as agreed between the Engineer and the Contractor. Proof of this must be provided to the Engineer. Scouring of water from pipelines with unpleasant odour to be undertaken in consultation and agreement with the Engineer. 	<ul style="list-style-type: none"> Site monitoring 	<ul style="list-style-type: none"> Daily 	<ul style="list-style-type: none"> As per the OHS&A and safety standards 	<ul style="list-style-type: none"> Construction until demobilisation by the contractor 	<ul style="list-style-type: none"> Engineer and contractor 	<ul style="list-style-type: none"> Reporting and auditing
	<ul style="list-style-type: none"> Greenhouse gas emissions 	<ul style="list-style-type: none"> Contributing influence to global warming 	<ul style="list-style-type: none"> The level of greenhouse gas emissions emanating from plant and vehicles on site is kept to a minimum 	<ul style="list-style-type: none"> All vehicles, plant and equipment serviced as per manufacturer's maintenance schedules. Evidence available of service records kept for all vehicles, plant and equipment. No evidence of plant, equipment or vehicles in bad condition. 	<ul style="list-style-type: none"> Plant and equipment to function at an optimal level. Where possible lead replacement petrol to be used. Where possible low sulphur containing diesel to be used. All vehicles and equipment must be maintained and serviced according to manufacturer's specifications. Implementing disaster management policies and onsite employee training specifically for extreme weather event (including heavy rain occurrences, and lightning strikes) risk management protocols. Ensure environmental hazard procedures and protocols are in place onsite. Install lightning rods and have a lightning sensor to provide early warning when lightning is still a safe distance away. 	<ul style="list-style-type: none"> Site monitoring 	<ul style="list-style-type: none"> Daily monitoring of condition of vehicles. Quarterly feedback on the project's carbon footprint at the Environmental Management Review sessions. 	<ul style="list-style-type: none"> National Environmental Management: Air Quality Act (NEMAQA) 	<ul style="list-style-type: none"> Construction until demobilisation by the contractor 	<ul style="list-style-type: none"> Engineer and contractor 	<ul style="list-style-type: none"> Reporting and auditing
	<ul style="list-style-type: none"> Emission of noxious fumes from welding 	<ul style="list-style-type: none"> Development of Respiratory problems. Irritation to eyes. 	<ul style="list-style-type: none"> Damage caused to lungs and eyes is prevented. 	<ul style="list-style-type: none"> Use or appropriate / required PPE including welding mask, gloves and overall. Medical test results prior to construction not be exceeded. 	<ul style="list-style-type: none"> Required PPE must be worn at all times. 	<ul style="list-style-type: none"> Site monitoring 	<ul style="list-style-type: none"> Daily 	<ul style="list-style-type: none"> As per the OHS&A and safety standards 	<ul style="list-style-type: none"> Construction until demobilisation by the contractor 	<ul style="list-style-type: none"> Engineer and contractor 	<ul style="list-style-type: none"> Reporting and auditing
10. Management of Watercourses	<ul style="list-style-type: none"> Change in Aquatic health 	<ul style="list-style-type: none"> Deterioration of the wetland at BP E because of construction/mining activities. Reductions in diversity or populations of aquatic life. 	<ul style="list-style-type: none"> Ensure that the wetland is protected and incur minimal negative impact to their resource quality (i.e. flow water quality, riparian habitat, morphology and aquatic biota). 	<ul style="list-style-type: none"> Existing Lawful Water Uses in accordance with NWA not be affected. 	<ul style="list-style-type: none"> A recommended buffer zone of 32m Zone of Regulation from the edge of the riparian zone, must be strictly adhered to during the construction phase of the project. Construction/mining areas should be demarcated and watercourses marked as "restricted" in order to prevent the unnecessary impacts to these systems. 100 meters of any water body, within the 1:100 year flood line and or delineated aquatic ecosystems and associated buffers must be included. Top layer of soils including pebbles, rocks and flotsam must be removed and stockpiled. Alluvial material must be removed and stockpiled. This is not to be reused in other areas. Screening of material required before replacement. Finer materials must be placed first, building to larger material on top. Construction/mining activities is prohibited in within the wetland on the BP E site. Any impacts caused to the wetland at the BP E site, must be rectified immediately under the guidance of the EM. 	<ul style="list-style-type: none"> Review periodic results from water quality monitoring and biomonitoring. Erosion monitoring. Conditions of WUL. Monitoring reports. 	<ul style="list-style-type: none"> Monthly 	<ul style="list-style-type: none"> General limits listed in the National Water Act (NWA) and the Classes and Resource Quality Objectives of Water Resources for the Mokolo, Matlabas, Crocodile West and Marico GN of 562 18 October 2019 	<ul style="list-style-type: none"> Construction until demobilisation by the contractor 	<ul style="list-style-type: none"> Measures pertaining to the general protection of water resources – throughout the duration of the construction period. 	<ul style="list-style-type: none"> Specialist or Aquatic ECO appointed for these sections. Engineer and ECO to monitor compliance. Contractor to implement management actions.

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11. Management of Heritage Features	<ul style="list-style-type: none"> • Destruction of graves and other sites of archaeological value • Destruction of the palaeontology 	<ul style="list-style-type: none"> • Loss of archaeological and palaeontological valuable artefacts. • Loss of cultural and heritage value to society. • Social unrest 	<ul style="list-style-type: none"> • Preserve sites and artefacts of archaeological and palaeontological interest, unearthed during construction as well as ensure that the correct protocols for grave relocation are adhered to. 	<ul style="list-style-type: none"> • Sites demarcated prior and during construction. • Evidence of records should further discoveries be identified during construction. • Full compliance to all mitigation measures required. 	<ul style="list-style-type: none"> • Include mitigation measures identified as part of environmental sensitivity walk down survey. • Search, rescue and relocation of heritage sites affected by construction. • Phase 2 Palaeontological survey and upgrading of chance find protocol (CFP). • Training session for Management Staff and the ECO in terms of the Palaeontological Heritage items that are expected in this area. • For any chance finds, all work will cease in the area affected and the Contractor will immediately inform the Engineer. A registered heritage specialist must be called to site for inspection. The relevant heritage resource agency (SAHRA) must be informed about the finding. Works in the area may only proceed once all the requirements have been met to the satisfaction of the Engineer in consultation with the heritage specialist. • Permits to be obtained in terms of the NHRA if heritage resources are to be impacted on and for the removal of graves. • Exhumation and relocation of graves once families and affected communities have been consulted and permission received for relocation. All cultural practices in terms of removal of graves as requested by family / community to be complied with. • Should any remains be found on site that is potentially human remains apply the change find procedure as described above. The South African Police Service should also be contacted. • Whenever possible, all heritage sites identified during this study with a significance of Medium and higher, must be preserved in situ by designing the development footprints in such a way that a buffer area of at least 50m is kept clear between any development footprints and construction activities and these heritage sites. This buffer zone should be demarcated with barrier tape before construction commences and machinery operators should be made aware of the reason for these demarcations. • The site-specific mitigation measures are required when the preservation of the identified heritage sites with a significance of Medium and higher, as well as their associated buffer areas, is not possible. This second phase mitigation work should be contracted out to a suitably qualified heritage management company. 	<ul style="list-style-type: none"> • Site monitoring 	<ul style="list-style-type: none"> • As part of the daily site monitoring. 	<ul style="list-style-type: none"> • National Heritage Resources Act 	<ul style="list-style-type: none"> • Pre-construction and construction 	<ul style="list-style-type: none"> • Contractor and Engineer 	<ul style="list-style-type: none"> • Audits by the EM.

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12. Management of Fire	• Fire Hazards	<ul style="list-style-type: none"> • Fire damage to surrounding properties, vegetation, crops and grazing land. • Potential injury or death of fauna, avifauna species, and humans. • Fire damage to equipment, plant, vehicles and construction materials. 	<ul style="list-style-type: none"> • No uncontrolled fires were started. 	<ul style="list-style-type: none"> • Adequate cooking facilities • No evidence of open fires. • Adequate and serviced firefighting equipment and materials easily accessible on site. 	<ul style="list-style-type: none"> • Comply with the National Veld and Forest Fire Act (No. 101 of 1998) and National Veld and Forest Fire Bill (B122B of 1998). • Work closely with the local Fire Protection Association. Determine requirements and add to list of emergency telephone numbers. Keep a fire danger index displayed on site and comply with requirements. Fire breaks are to be agreed with neighbours and the local Fire Protection Association. • Proper emergency response procedure to be in place for dealing with fires. • Burning of waste is not permitted. • Suitable precautions will be taken (e.g. suitable fire extinguishers, water bowsers, welding curtains) when working with welding or grinding equipment. • All fire control mechanisms (fire-fighting equipment) will be routinely inspected by a qualified investigator for efficacy thereof and be approved by local fire services. • All staff on site will be made aware of general fire prevention and control methods, and the name of the responsible person to alert to the presence of a fire. • No fires are allowed on site. • Firebreaks to be made for construction areas, as required. Dedicated smoking areas to be provided. 	<ul style="list-style-type: none"> • Site monitoring and inspections by fire coordinators, equipment inspectors / wardens and safety officers. 	<ul style="list-style-type: none"> • Weekly 	<ul style="list-style-type: none"> • Construction Regulation 27 of the OHSA (appointment of fire coordinators and equipment inspectors / wardens). 	<ul style="list-style-type: none"> • Pre-construction, construction and rehabilitation 	<ul style="list-style-type: none"> • Contractor and Engineer 	<ul style="list-style-type: none"> • Auditing by environmental and safety spheres.
13. Management of Social	• Disruption in the provision of services	<ul style="list-style-type: none"> • Disruption of the availability of water, electricity and telecommunications to surrounding landowners. • Negative effects on the well-being of the local inhabitants as well as the potential outbreak of disease. • Decline in the micro-economic output of the surrounding area 	<ul style="list-style-type: none"> • Disruption of all major services to the affected area is prevented. 	<ul style="list-style-type: none"> • No disruptions to daily activities of local communities and land users • Total number of complaints received from local communities and land users and action taken 	<ul style="list-style-type: none"> • All existing private access roads used for construction purposes, shall be maintained at all times to ensure that the local people have free access to and from their properties. • Care must be taken not to damage irrigation equipment, lines, channels and crops and other existing structures as identified in the assets and infrastructure study. 	<ul style="list-style-type: none"> • Site monitoring and regular follow-ups on complaints received. 	<ul style="list-style-type: none"> • Daily 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Construction 	<ul style="list-style-type: none"> • Contractor and Engineer 	<ul style="list-style-type: none"> • EM audits
	• Insufficient employment of local labour	<ul style="list-style-type: none"> • Social unrest. • Potential delays in construction programme. • Limiting growth in local economy. 	<ul style="list-style-type: none"> • Local labour where applicable have been employed as far as possible. 	<ul style="list-style-type: none"> • Evidence of staff employment record. • Total number of complaints received from local community and action taken 	<ul style="list-style-type: none"> • The Contractor must ensure that a percentage of the labour employed is from the local community. 	<ul style="list-style-type: none"> • Site monitoring and regular follow-ups on complaints received. 	<ul style="list-style-type: none"> • Monthly Reporting 	<ul style="list-style-type: none"> • Contract specification 	<ul style="list-style-type: none"> • Pre-construction and throughout the construction phase. 	<ul style="list-style-type: none"> • Contractor, Engineer and Project Implementer. 	<ul style="list-style-type: none"> • Audits on Contractor's appointments.
			<ul style="list-style-type: none"> • Development of unskilled, semi-skilled and skilled personnel recruited from the Project Area, and wider Limpopo Province respectively 	<ul style="list-style-type: none"> • Training of females, expenditure on learner ships and expenditure on internships 	<ul style="list-style-type: none"> • Contractor must institute an approved training and skills development programme to meet targets and criteria. • The training shall be restricted to trade skills for the construction industry in categories: trade workers, machine operators, elementary workers, safety representatives, supervisors, etc. • Additional training must be provided for workers for the duration of construction, directed towards: (i) satisfying the immediate requirements of the Works, and (ii) introducing unskilled employees to the constraints and requirements of an organised working environment, and (iii) to the use of construction tools and equipment. 	<ul style="list-style-type: none"> • Site monitoring and regular follow-ups on complaints received. 	<ul style="list-style-type: none"> • Monthly Reporting 	<ul style="list-style-type: none"> • Contract specification 	<ul style="list-style-type: none"> • Pre-construction and construction phases 	<ul style="list-style-type: none"> • Contractor and Engineer 	<ul style="list-style-type: none"> • Audits on Contractor's appointments

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	<ul style="list-style-type: none"> Damage and inaccessibility to powerlines 	<ul style="list-style-type: none"> Disruption of the provision of electricity supply to the surrounding areas. Impeding the maintenance of the powerlines. Potential injury and death of site staff. 	<ul style="list-style-type: none"> Damage is prevented and allowance is made for easy accessibility for Eskom to powerlines and servitudes at all times. 	<ul style="list-style-type: none"> No recorded damage to power lines. Total number of complaints received from Eskom and action taken No visible impediment of servitudes observed. 	<ul style="list-style-type: none"> A formal application must be submitted to Eskom stating exactly what construction procedures will be used near the Eskom power lines. A locality and layout plan of the pipeline must be provided indicating how the Eskom services will be affected. Any cost and claims due to interruptions or interference to Eskom Services causing power supply loss or loss of income, due to this application will be borne by the Implementer. Eskom must have ingress to and egress from its services at all times. No mechanical equipment, including mechanical excavators, may be used under or in close proximity to Eskom services without the prior approval of Eskom's authorised representatives. The consent is further subject to the landowner's permission for the proposed works. A copy of the permission must be filed with Eskom seven days before any work is carried out in the servitude. No excavations may be executed closer than 6 metres from any of Eskom's overhead power lines and 1,5 metres from Eskom's underground cables unless Eskom's authorised representative is on site. Blasting may only occur under the strict supervision of Eskom's authorised representative and after at least three days notification to Eskom. Should any of Eskom's services be damaged during commencement of any work, the incident must be immediately reported to Eskom's 24-hour fault number 0860 037 566 Statutory ground or structure to conductor clearances is to be always maintained. 	<ul style="list-style-type: none"> Daily site monitoring and evaluation of complaints received 	<ul style="list-style-type: none"> Daily monitoring and monthly auditing 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Construction phase 	<ul style="list-style-type: none"> Contractor and Engineer 	<ul style="list-style-type: none"> Monthly auditing
	<ul style="list-style-type: none"> Trespassing on construction site and private properties 	<ul style="list-style-type: none"> Theft. Vandalism. Safety to site staff jeopardised. Injury to trespassers resulting in possible lawsuits. 	<ul style="list-style-type: none"> The construction site is fully secured with adequate access control. 	<ul style="list-style-type: none"> Secure and adequate fencing and access control. 24-hour security evident on site. 	<ul style="list-style-type: none"> Labourers associated with the contractor must be easily recognizable (i.e. company issued overalls with company name / logo etc.), and no non-labourer will be allowed within the construction/mining site at any time. The Contractor shall take all necessary precautions against trespassing on private properties. The contractor will be responsible for his own security arrangements and shall comply with all site security instructions. Gates shall be installed where necessary. All gates shall be fitted with locks and be kept locked at all times during the construction phase. Gates shall only be left open on request of the Landowner. Protect and maintain existing private property, fences and gates. Respect the open or closed status of gates for the duration of the construction/mining period. 	<ul style="list-style-type: none"> Daily site monitoring and evaluation of complaints received 	<ul style="list-style-type: none"> Daily monitoring and monthly auditing 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Construction phase 	<ul style="list-style-type: none"> Contractor and Engineer 	<ul style="list-style-type: none"> Monthly auditing

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	<ul style="list-style-type: none"> Influx of jobseekers 	<ul style="list-style-type: none"> Loitering at construction/mining site. Increase in crime and social pathologies. Pressure on existing services/infrastructure. Development of informal settlements. 	<ul style="list-style-type: none"> The influx of job-seekers is minimised and the risk of their presence leading to negative social impacts is reduced. 	<ul style="list-style-type: none"> Records of resident status of temporary workers. Existence of labour desk. Total number of complaints from local residents regarding population influx and action taken 	<ul style="list-style-type: none"> Employ people from local communities as far as possible, with adequate verification of applicants' local resident status. Clear communication of preference for local labour to surrounding communities. Establishment of labour desk away from site for recruitment; alternatively, working through office of the local Department of Labour. Strict control of access to construction/mining site. Labourers associated with the contractor must be easily recognisable (i.e. the Contractor must issue overalls with company name / logo etc.), and no non-labourer will be allowed within the construction camp at any time. The Implementer in consultation with the local SAPS / community policing forum must set up an adequate response plan to criminal incidents. 	<ul style="list-style-type: none"> Daily site monitoring and evaluation of complaints received 	<ul style="list-style-type: none"> Daily monitoring and monthly auditing 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Pre-construction and Construction phase 	<ul style="list-style-type: none"> Influx of job-seekers 	<ul style="list-style-type: none"> Loitering at construction site. Increase in crime and social pathologies. Pressure on existing services/infrastructure Development of informal settlements.
	<ul style="list-style-type: none"> Loss of farm labour to construction/mining work 	<ul style="list-style-type: none"> Landowner resistance to the project. Increased unemployment after construction ends. 	<ul style="list-style-type: none"> Local people are encouraged not to leave current employment for temporary work on the project. 	<ul style="list-style-type: none"> Total number of complaints from local landowners regarding loss of farm labour and action taken 	<ul style="list-style-type: none"> During community engagement / information dissemination, emphasis must be placed on the temporary nature of construction employment. Strict adherence to Labour legislation (in terms of employment of minors, etc.) must at all times be made. 	<ul style="list-style-type: none"> Daily site monitoring and evaluation of complaints received 	<ul style="list-style-type: none"> Daily monitoring and monthly auditing 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Pre-construction and Construction phase 	<ul style="list-style-type: none"> Loss of farm labour to construction work 	<ul style="list-style-type: none"> Landowner resistance to the project. Increased unemployment after construction ends.
	<ul style="list-style-type: none"> Reduced productivity of subsistence farmland 	<ul style="list-style-type: none"> Increased socio-economic vulnerability. Reduction in food security. 	<ul style="list-style-type: none"> The impact of the project on the productivity of subsistence farmland is kept to a minimum. 	<ul style="list-style-type: none"> Implementation of measures to minimise impact on soil productivity. Where loss of soil productivity is inevitable, evidence of measures to compensate for its impact on households / communities is available. 	<ul style="list-style-type: none"> Management measures to limit impact of disturbance on soil fertility. The Implementer must make provision for post-relocation support for a predefined time period to ensure restoration of livelihoods. Possible provision must be provided for agricultural extension services and treatment of disturbed soil with basal fertiliser. Possibility of compensation to the farmer, the claim will be investigated and subjected to an approval process. 	<ul style="list-style-type: none"> Daily site monitoring and evaluation of complaints received 	<ul style="list-style-type: none"> Daily monitoring and monthly auditing 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Pre-construction and Construction phase 	<ul style="list-style-type: none"> Reduced productivity of subsistence farmland 	<ul style="list-style-type: none"> Increased socio-economic vulnerability. Reduction in food security.
	<ul style="list-style-type: none"> Presence of a construction workforce 	<ul style="list-style-type: none"> Increased prevalence of HIV/AIDS 	<ul style="list-style-type: none"> Opportunities for the transmission of HIV between newcomers and the incumbent population is minimised. 	<ul style="list-style-type: none"> Records of implementation of HIV/AIDS awareness programme. No accommodation on site. 	<ul style="list-style-type: none"> Appointment of qualified service provider to implement HIV/AIDS awareness programme. Implementation of HIV/AIDS awareness programme for construction workforce and local communities (including incorporation of HIV/AIDS training in induction curriculum and H&S toolbox talks). Placement of HIV/AIDS awareness material (posters, pamphlets, etc.) at construction site. Provision of free condoms on site. 	<ul style="list-style-type: none"> Daily site monitoring and evaluation of complaints received 	<ul style="list-style-type: none"> Daily monitoring and monthly auditing 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Pre-construction and Construction phase 	<ul style="list-style-type: none"> Presence of a construction workforce 	<ul style="list-style-type: none"> Increased prevalence of HIV/AIDS

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					<ul style="list-style-type: none"> Ensure access of workers to voluntary testing and counselling. Where possible, housing of construction workforce in existing residential areas rather than construction camps. Strict control of access to the construction camp, to reduce likelihood of prostitution 						
		<ul style="list-style-type: none"> Increased prevalence of COVID-19 	<ul style="list-style-type: none"> Opportunities for the transmission of COVID-19 between field workers 	<ul style="list-style-type: none"> Record of implementation of COVID 19 Plan Records of screening all traffic on site 	<ul style="list-style-type: none"> All the necessary precautions against the spreading of disease, especially COVID-19. Keeping anti-venom onsite. Measures for screening, physical distancing, masks, cleaning, disinfecting and personal protective equipment (PPE). Compliance with the Occupational Health and Safety Act (Act No. 85 of 1993), Construction Regulations (2014) and other relevant regulations. 	<ul style="list-style-type: none"> Daily site monitoring and evaluation of complaints received 	<ul style="list-style-type: none"> Daily monitoring and monthly auditing 	<ul style="list-style-type: none"> Amendment of directions issued in terms of Regulation 4(8) of the Regulations made under Section 27(2) of the Disaster Management Act, 2002 (act no. 57 of 2002): measures to prevent and combat the Spread of COVID -19 	<ul style="list-style-type: none"> Construction phase 	<ul style="list-style-type: none"> Presence of a construction workforce 	<ul style="list-style-type: none"> Increased prevalence of Covid.
14. Management of reinstatement and rehabilitation	<ul style="list-style-type: none"> Restoration and rehabilitation of affected environment 	<ul style="list-style-type: none"> Erosion and loss of productive topsoil due to ineffective rehabilitation. Infestation by alien invasive plant species. Environmental degradation due to stockpiles, spoil and other construction materials being abandoned on site instead of removed. Dust generation due to exposed surfaces. Reduction in species diversity after rehabilitation has been completed. Reduction in soil productivity 	<ul style="list-style-type: none"> Adequate reinstatement and rehabilitation of construction/mining areas. Conduct concurrent or progressive rehabilitation of areas affected by construction/mining activities 	<ul style="list-style-type: none"> Complete site clean-up. Reinstate and rehabilitate areas disturbed by construction/mining activities. Habitats restored. Contractor's Method Statement. Appropriate rehabilitation measures required for each land portion must be ascertained, authorised and implemented for the duration of the project. The seed mix for use in rehabilitation must be an approved mix of indigenous grass species common to the area. All vegetative matter removed during the search and rescue operation must be replanted in the area that they were rescued from. 	<ul style="list-style-type: none"> Closure and Rehabilitation Management Plan to be developed, which will include additional measures identified during construction to supplement the reinstatement and rehabilitation provisions included in the CEMPr. Targets to be specified for re-growth. Ensure that rehabilitation is in line with the surrounding natural environment and pre-construction state of the affected area. Alien vegetation control to form part of the rehabilitation measures Cordon off areas that are under rehabilitation as no-go areas. <p><u>Removal of structures and infrastructure –</u></p> <ul style="list-style-type: none"> Clear and completely remove from site all construction plant, equipment, storage containers, temporary fencing, temporary services, and fixtures. Ensure that all temporary access roads utilised during construction and which are not earmarked for use during the operational phase, are returned to a usable state and/or a state no worse than prior to construction. 	<ul style="list-style-type: none"> Monitoring reports. Post-construction Audit 	<ul style="list-style-type: none"> Monthly 	<ul style="list-style-type: none"> NEMA 	<ul style="list-style-type: none"> Rehabilitation Phase 	<ul style="list-style-type: none"> Throughout the duration of the construction period, as relevant to the concurrent or progressive reinstatement and rehabilitation of affected areas. Up to end of defects liability period. 	<ul style="list-style-type: none"> Engineer and ECO - to monitor compliance. Contractor to implement management actions.

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				<ul style="list-style-type: none"> • Care shall be taken in replanting of vegetation in wetland to ensure the highest level of success in rehabilitation. • Vegetated cover of rehabilitated areas must correlate with the cover of the surrounding natural vegetation. 	<p><u>Inert waste and rubble –</u></p> <ul style="list-style-type: none"> • Clear the site of all inert waste and rubble, including surplus rock, foundations and batching plant aggregates. After the material has been removed, the site shall be reinstated and rehabilitated. • Load and haul excess spoil and inert rubble to fill in borrow pits / dongas or to dump sites indicated / approved by the Engineer. • All remaining combustible biomass from bush clearing operations must be removed from the area, unless it is to be used in rehabilitation measures. <p><u>Domestic waste –</u></p> <ul style="list-style-type: none"> • Remove from site all domestic waste and dispose of in the approved manner at a registered waste disposal site. <p><u>Hazardous waste and pollution control –</u></p> <ul style="list-style-type: none"> • Remove from site all pollution containment structures. • Remove from site all temporary sanitary infrastructure and waste water disposal systems. Take care to avoid leaks, overflows and spills and dispose of any waste in the approved manner. • Comply with relevant provisions under the following CEMPr sections – <ul style="list-style-type: none"> ○ Management of Storage and Handling of Hazardous Material; ○ Management of Water; ○ Management of Waste; and ○ Management of Pollution Generation Potential. <p><u>Final shaping –</u></p> <ul style="list-style-type: none"> • Make safe all dangerous excavations by backfilling and grading, as required. • In general, no slopes steeper than 1(V):5(H) are permitted in cut-and-fill areas, unless otherwise specified by the Engineer. Steeper slopes require protection. New slopes must mimic the natural slopes and topography, where possible. • Programme the backfill of excavations so that subsoil is deposited first, followed by the topsoil. Compact in layers for best results. • Monitor backfilled areas for subsidence (as the backfill settles) and fill depressions using available material. • Shape all disturbed areas to blend in with the surrounding landscape, where possible. • Ensure that no excavated material or stockpiles are left on site and that all material remaining after backfill is landscaped to blend in with the surrounding landscape. • Topsoil replacement and soil amelioration – <ul style="list-style-type: none"> ○ Execute top soiling activity prior to the rainy season or any expected wet weather conditions. ○ Execute topsoil placement only after all construction work has ceased. ○ Contractor to test top 15 cm soil at predetermined distances for fertilizer requirements. This testing must be done on topsoil stockpiles prior to replacement and not in situ soils. All testing to occur at a SANS 17025 approved laboratory. The ARC “farmers test” is recommended. 						

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					<ul style="list-style-type: none"> ○ No fertiliser must be applied to 100 metres of any water body, within the 1:100 year flood line and or delineated aquatic ecosystems and associated buffers to prevent alteration of water quality parameters. ○ Prior to replacement of topsoil, any possible alien vegetation must be removed. ○ Replace and redistribute stockpiled topsoil together with herbaceous vegetation, overlying grass and other fine organic matter in all disturbed areas of the construction site, including temporary access routes. Replace topsoil to the original depth. ○ Place topsoil in the same area from where it was stripped. If there is insufficient topsoil available from a particular soil zone to produce the minimum specified depth, topsoil of similar quality may be brought from other surplus areas of similar quality. This excludes aquatic ecosystems. ○ Do not use topsoil suspected to be contaminated with the seed of alien vegetation. Alternatively, the soil is to be appropriately treated and monitored for alien vegetation re-establishment ○ Ensure that storm water run-off is not channelled alongside the gentle mounding, but that it is taken diagonally across it. ○ Shape remaining stockpiled topsoil not utilised elsewhere in an acceptable manner so as to blend in with the local surrounding area. ○ After topsoil placement is complete, spread available stripped vegetation randomly by hand over the top-soiled area. <p><u>Ripping and scarifying –</u></p> <ul style="list-style-type: none"> • Rip and/or scarify all areas following the application of topsoil to facilitate mixing of the upper most layers. Whether ripping and/or scarifying is necessary it will be based on the site conditions immediately before these works commence. • Rip and/or scarify all disturbed (and other specified) areas of the construction site, including temporary access routes and roads, compacted during the execution of the works. • Rip and/or scarify along the contour to prevent the creation of down-slope channels. • Do not rip and/or scarify areas under wet conditions, as the soil will not break up <p><u>Planting –</u></p> <ul style="list-style-type: none"> • All plant species for use by the project must be reviewed and approved by qualified specialists prior to use on site. • Revegetation must match the vegetation type which previously existed, unless otherwise indicated by a suitable specialist. • No exotic plants may be used for rehabilitation purposes. Only indigenous plants of the area may be utilised • Although the use of indigenous vegetation is promoted, where there is a risk of soil erosion (e.g. steep slopes) a suitable specialist must be consulted to determine the most appropriate stabilisation measures. 						

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					<p><u>Transplanted plants -</u></p> <ul style="list-style-type: none"> • All planting work is to be undertaken by suitably experienced personnel, making use of the appropriate equipment. • Transplanting entails the removal of plant material and replanting the same plants in another designated position. • Transplant trees and shrubs into designated positions. • Establish further specifications for transplanted plants. <p><u>Nursery plants –</u></p> <ul style="list-style-type: none"> • All appropriate permits must be in place • All planting work is to be undertaken by suitably experienced personnel, making use of the appropriate equipment. • Plant all trees, shrubs and individual plants in designated positions. • Planting should preferably be done at the start of spring during the rainy season. • After planting, each plant must be well watered, adding more soil upon settlement if necessary. • Arboreal species planting must include dedicated fertiliser applications • Establish further specifications for nursery plants. • Ensure no pathogens or exotic invertebrates (e.g. earthworms) from nurseries are introduced during rehabilitation. <p><u>Seeds and seedlings -</u></p> <ul style="list-style-type: none"> • All planting work is to be undertaken by suitably experienced personnel, making use of the appropriate equipment. • Tree seedling material should be fresh and of local origin. Resist using plants from far afield as they may not be best suited to local climatic or soil conditions. Ideally make use of species representative of the vegetation types • Small seedlings are likely to transplant more successfully than will large ones. These should be potted and kept under nursery conditions until they are large enough to plant out. • Plants kept in nurseries to be monitored for pathogens and exotic invertebrates. • Establish further specifications for seeds and seedlings. <p><u>Grassing -</u></p> <ul style="list-style-type: none"> • Suitably trained personnel must undertake grassing by making use of the appropriate equipment and grass species as specified by the terrestrial ecologist. • Hydroseeding must be applied to all impacted areas. A suitable mix of seed at a rate of 20-35 kg/ha applied. In erosion prone areas this mix can be doubled. • Fertilising can be applied in combination with hydroseeding and a suitable liquid fertiliser is recommended. • Reseeding may be done at any time of the year, but seeding must be done by sowing appropriate seed mixtures only between 1 October and end February. • Soil binding using a suitable chemical during will only be specified where stabilisation is urgent, and cannot wait for the summer. • Establish further specifications for sods, runners and hand seeding. • Establish further specifications for reseeded aquatic ecosystems. 						

v) Financial Provision

(1) Determination of the amount of Financial Provision.

According to the Official guideline as contemplated in Regulation 54(1) to the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) the amount calculated for Borrow Pit D is R823 543.68 (according to the 2005 Guideline for the calculation of the quantum in terms of the MPRDA and Regulations). Therefore this figure was subjected to a CPI adjustment.

i) Explain how the aforesaid amount was derived.

The amount was derived using the rate per hectare, for Borrow Pit D, the rate per hectare is R50 000 as it is considered medium in terms of environmental sensitivity.

(a) Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulation.

Refer to the Closure and Rehabilitation Plan in Appendix D

(b) Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties.

Refer to the Closure and Rehabilitation Plan in Appendix D

(c) Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining area at the time of closure.

Refer to the Closure and Rehabilitation Plan in Appendix D

(d) Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives.

The rehabilitation plan addresses the requirements for closure. The rehabilitation plan consists of specialists' recommendations for rehabilitation including landscaping and vegetation.

- (e) **Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.**

According to the Official guideline as contemplated in Regulation 54(1) to the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) the amount calculated for Borrow Pit D is R823 543.68 (according to the 2005 Guideline for the calculation of the quantum in terms of the MPRDA and Regulations). Therefore this figure was subjected to a CPI adjustment.

- (f) **Confirm that the financial provision will be provided as determined.**

The financial provision will be made available as per Section e above.

e) Indicate the frequency of the submission of the performance assessment/ environmental audit report.

The ECO will conduct monthly monitoring on the site and will produce an environmental audit report for each month.

f) Environmental Awareness Plan

(1) Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work.

The Applicant is responsible for compiling an Environmental Awareness Training Programme for all staff members that aims at explaining the mitigation measures described in this report before any construction activities commence. Before commencing with any work, all staff members shall attend the Environmental Awareness Training Programme.

After attending the programme, all contractors and sub-contractors shall sign an Environmental Training register as proof of their training; which shall be kept as proof for auditing purposes. The environmental training should, as a minimum, include (but not be limited to) the following:

The importance of conformance with all environmental policies:

- Legal
- Financial
- Environmental
- Health and safety

The environmental impacts, actual or potential, of the proposed activities: - Impacts on fauna and flora,

- Impacts on water and soil
- Impacts on surrounding communities

The environmental benefits of improved personal performance
Specific roles and responsibilities in achieving conformance with the environmental policy and procedures and with this EMP, including associated procedures and emergency preparedness and response requirements. The potential personal consequences of departure from specified operating procedures:

- Disciplinary,
- Loss of income,
- Penalties for impacting environment in a negative way

(2) Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.

Site specific mitigation measures that have been incorporated in to the EMPr, must be considered as an essential tool, to ensure that the least adverse impact on the environment is caused as a result of the borrow pits and associated access roads. All employees must be able to have access to the EMPr, and the importance of the EMPr and mitigation measures contained in the EMPr should be emphasised during toolbox talks.

g) Specific information required by the Competent Authority
(Among others, confirm that the financial provision will be reviewed annually).
N.A

2) UNDERTAKING

The EAP herewith confirms

- a) the correctness of the information provided in the reports
- b) the inclusion of comments and inputs from stakeholders and I&APs ;
- c) the inclusion of inputs and recommendations from the specialist reports where relevant; and
- d) that the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected. parties are correctly reflected herein.

P. Nathaniel

Signature of the environmental assessment practitioner:

GIBB as part of the GBN-JV

Name of company:

14 September 2021

Date:

-END-

APPENDIX A
MAPS

APPENDIX B
CV

**APPENDIX C
LAYOUT PLAN**

APPENDIX D
SPECIALIST STUDIES

APPENDIX E
APPLICATION FORM AND DFFE SCREENING REPORT

APPENDIX F
PUBLIC PARTICIPATION PROCESS

APPENDIX G
IMPACT ASSESSMENT

APPENDIX H
SITE PICTURES