GA Environment

DRAFT BASIC ASSESSMENT REPORT

ENVIRONMENTAL AUTHORISATION (BASIC ASSESSMENT) PROCESS FOR THE PROPOSED SLURRY AND RETURN WATER PIPELINE FROM TARGET TAILINGS STORAGE FACILITY TO FREDDIE'S 9 TAILINGS STORAGE FACILITY (TSF), ALLANRIDGE (WELKOM) IN THE FREE STATE PROVINCE (FS30/5/1/2/226MR)

November 2022

HARMONY

Environmental best practice, safety and sustainability

DRAFT BASIC ASSESSMENT REPORT

for

THE PROPOSED DEVELOPMENT OF A PIPELINE FROM TARGET TAILINGS STORAGE FACILITY TO FREDDIE'S 9 TAILINGS STORAGE FACILITY (TSF), FREE STATE PROVINCE

Prepared for:

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29 November 2022

PROJECT INFORMATION

Title:	The Proposed Slurry and Return Water Pipeline from Target Tailing Storage Facility to Freddie's 9 Tailings Storage Facility (TSF), Allanridge (Welkom) In the Free State Province
Competent Authority:	Department of Mineral Resources and Energy
Reference No.:	FS30/5/1/2/226MR
Applicant:	Harmony Gold Mining Company Limited
Environmental Assessment Practitioner:	GA Environment (Pty) Ltd.
Compiled by:	Vukosi Mabunda, Nyaladzi Nleya Reviewer: Nkhensani Khandlhela
Date:	29 November 2022

DOCUMENT HISTORY AND QUALITY CONTROL

Revision	Revision Date	Revision Comments	Originator	Reviewed By
1	11th November 2022	Draft report for Internal Review	Vukosi Mabunda	Nkhensani Khandlhela

SIGNING OF THE ORIGINAL DOCUMENT

Original	Prepared by	Reviewed by	Approved by
Date: **14th November 2022**	Name: **Vukosi Mabunda**	Name: **Nyaladzi Nleya**	Name: **Nkhensani Khandlhela**

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AFFIRMATION OF ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

I ***Vukosi Mabunda***, an EAP employed by ***GA Environment (Pty) Ltd*** declare that the information provided in this report is correct and relevant to the activity/ project, that comments from Interested and Affected Parties have been incorporated into this report, that the report has included inputs from Specialists and that all relevant project information was made available to Interested and Affected Parties.

Digital Signature	15.11.2022
SIGNATURE OF EAP	**DATE**

LIST OF ABBREVIATIONS / ACRONYMS

BA	Basic Assessment
CA	Competent Authority
CBA	Critical Biodiversity Area
DBAR	Draft Basic Assessment Report
DFFE	Department Forestry, Fisheries and Environment,
DMRE	Department of Mineral Resources and Energy
DWS	Department of Water and Sanitation
EA	Environmental Authorization
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioners Association of South Africa
EAR	Environmental Audit Report
ECA	Environmental Conservation Act No. 73 of 1989
ESA	Ecological Support Area
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EO	Environmental Officer
ERAP	Emergency Response Action Plan
ER	Engineer's Representative
ESR	Environmental Site Representative
GA	General Authorisation
GIS	Geographic Information System
HCS	Hazardous chemical Substance
I&AP	Interested and Affected Party
LDM	Lejweleputswa District Municipality
MA	Mining Area
MHSA	Mine Health and Safety Act 29 of 1996
MPRDA	Mineral Petroleum Resources Development Act
MR	Mining Right
MSDS	Material Safety Data Sheet
N/A	Not Applicable
NEMA	National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998)
NEM:BA	National Environmental Management: Biodiversity Act (Act 10 of 2004)
NEM:WA	National Environmental Management: Waste Act 59 of 2008
PM	Project Manager
PPP	Public Participation Process
RWD	Return Water Dam

SACNASP	South African Council for Natural Scientific Professions
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SANS	South African National Standards
SDF	Spatial Development Framework
TSF	Tailings Storage Facility
WUA	Water Use Authorisation
WULA	Water Use License Application

GLOSSARY OF TERMS

This section provides a catalogue of terms and definitions, which may be used in this report.

Term	Definition
Alien Invasive Species	Species of plants, animals or other organisms that are not indigenous to a region and which easily spread and destroy the indigenous plant species, taking over an area and causing biological and socio-economic harm.
Buffer	A strip of land surrounding a wetland or riparian area in which activities are controlled or restricted
Basic Assessment Process	An environmental assessment process that is undertaken in line with Listing Notices 1 and 3 in terms of the NEMA EIA Regulations with the aim of obtaining Environmental Authorisation.
Clearing/Clearance	Clearing/Clearance refers to the removal of vegetation through permanent eradication and in turn no likelihood of regrowth. 'Burning of vegetation (e.g. fire-breaks), mowing grass or pruning does not constitute vegetation clearance, unless such burning, mowing or pruning would result in the vegetation being permanently eliminated, removed or eradicated'.
Competent Authority	An organ of state charged by the National Environmental Management Act (NEMA) with evaluating the environmental impact of an activity and, where appropriate, with granting or refusing an environmental authorisation in respect of that activity.
Conservation Plan Areas (C-Plan Areas)-	A tool developed by the Environmental Provincial Department to identify sensitive areas. The main purposes of this tool is to: • serve as the primary decision support tool for the biodiversity component of the Environmental Impact Assessment (EIA) process. • inform protected area expansion and biodiversity stewardship programmes in the province; and serve as a basis for development of Bioregional Plans in municipalities within the province. Some of the aspects that inform the identification of C-Plan Areas include Critical Biodiversity Areas (CBAs), Ecological Support Areas (ESA's), Watercourses, Ridges, Protected Areas, etc
Critical Biodiversity Area	Areas that are deemed important to conserve ecosystems and species. For this reason, these areas require protection.
Cultural significance	Means aesthetic, architectural, historical, scientific, social, spiritual, linguistic, or technological value or significance.
Development	Means the building, erection, construction or establishment of a facility, structure, or infrastructure, including associated earthworks or Quarries, that is necessary for the undertaking of a listed or specified activity, but excludes any modification, alteration or expansion of such a facility, structure or infrastructure, including associated earthworks or quarries, and excluding the redevelopment of the same facility in the same location, with the same capacity and footprint.
Duty of Care	Every person who causes, has caused or may cause significant pollution or degradation of the environment to take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environmental is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution and degradation of the environment."
Decommissioning	Means to take out of active service permanently or dismantle partly or wholly, or closure of a facility to the extent that it cannot be readily recommissioned.
Environment	the surroundings within which humans exist and that are made up of— (i) the land, water and atmosphere of the earth;

Term	Definition
	(ii) micro-organisms, plant and animal life; (iii) any part or combination of (i) and (ii) and the interrelationships among and between them; and (iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.
Ecological Support Area	Areas that support the ecological functioning of protected areas or CBAs or provide important ecological infrastructure.
Environmental Assessment Practitioner	Individual responsible for the planning, management, coordination or review of environmental impact assessments, strategic environmental assessments, environmental management programmes or any other appropriate environmental instruments introduced through regulations.
Environmental Authorisation	This is a decision by a Competent Authority to authorise a listed activity in terms of the National Environmental Management Act (NEMA). The authorisation means that a project, either in totality or partially, can commence subject to certain conditions. The Competent Authority has a right to refuse to grant authorisation for a project in totality or partially.
Environmental Impact Assessment Process:	An environmental assessment process that is undertaken in line with Listing Notice 2 the NEMA EIA Regulations with the aim of obtaining Environmental Authorisation.
Environmental Management Programme:	A programme with set objectives and timeframes that seek to achieve a required end state and describes how activities that have or could have an adverse impact on the environment will be mitigated, controlled, and monitored.
Flora	Plant life that occurs in a specific geographical region and/habitat.
Fauna	Animal life that occurs in a specific geographical region and/habitat.
Heritage Resource	Means any place or object of cultural significance.
Indigenous Vegetation	plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years.
Interested and Affected Party	in relation to an application for Environmental Authorisation, this refers to an interested and affected party whose name is recorded in the register opened for that application in terms of regulation 42 of the NEMA EIA Regulations. This party will ideally be interested in the development but also affected by the proposed application and have a certain interest in the application.
Public Participation Process	In relation to the assessment of the environmental impact of any application for an environmental authorisation, means a process by which potential Interested and Affected Parties are given opportunity to comment on, or raise issues relevant to, the application.
Regulated area of a watercourse:	• The outer edge of the 1:100-year flood line and /or delineated riparian habitat whichever is the greatest measured from the middle of a river, spring, natural channel, lake or dam. • In the absence of a determined 1:100-year flood line or riparian area, the area within 100m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench (subject to compliance to section 144 of the Act). • 500m radius from the delineated boundary of any wetland or pan.
Riparian Area	A Habitat that includes the physical structure and associated vegetation of the areas associated with a watercourse which are commonly characterised by alluvial soils, and which are inundated or flooded to an extent and with a

Term	Definition
	frequency sufficient to support vegetation of species with a composition and physical structure distinct from those of adjacent land areas.
Species of Conservation Concern	IUCN Red List definition: Threatened species, and other species of significant conservation importance: Extinct, Extinct in the Wild, Near Threatened, Data Deficient. In South Africa, the following additional categories are added: Rare, Critically Rare.
Threatened or Protected Species	These refers to either plants or animals that are at a threat of Extinction or are protected due to their high conservation value or national importance.
Urban Edge	A demarcated edge of an area that is used as land use management tool to manage, direct and control the outer limits of development growth around an urban area. The aim is to control urban sprawl due to its associated adverse impacts.
Watercourse	(a) a river or spring; (b) a natural channel in which water flows regularly or intermittently; (c) a wetland, lake or dam into which, or from which, water flows; and (d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks;
Wetland	Land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

Appendices

mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

BASIC ASSESSMENT REPORT
AND
ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

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: Harmony Gold Mining Company Limited

TEL NO: (011) 411 2000
FAX NO: (011) 684 0188
POSTAL ADDRESS: PO Box 2, Randfontein 1760
PHYSICAL ADDRESS: 22 Main Reef Rd, Randfontein 247-IQ, Randfontein, 1759
FILE REFERENCE NUMBER SAMRAD: FS30/5/1/2/226MR

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 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 un-interpreted 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 content;

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 theses 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

3. Contact Person and correspondence address

a) Details of:

i) The EAP who prepared the report

Name of the Practitioner: Mr Vukosi Mabunda
Tel No.: 011 312 2537
Fax No. : 011 805 1950
e-mail address: environment@gaenvironment.com; and vukosim@gaenvironment.com

ii) Expertise of the EAP.

(1) **The qualifications of the EAP**

Mr Vukosi Mabunda holds an MSc degree in Geography. He is currently registered with the South African Council of Natural Scientific Professions (SACNASP) as a Professional Natural Scientist (Registration No 134178) in the fields of Environmental Science and Geospatial Science and as a Registered Environmental Assessment Practitioner with the Environmental Assessment Practitioners Association of South Africa (EAPASA) (Registration No 2019/867). The qualifications and proof of registrations are attached to **Appendix A** of this report.

(2) **Summary of the EAP's past experience**.

Vukosi Mabunda is an Environmental Assessment Practitioner with Five (5) years of professional experience as an Environmental Assessment Practitioner and GIS Practitioner. Vukosi specialises in environmental authorisations applications, environmental compliance monitoring, environmental management plans, water use authorisation, stakeholder engagement. He has specialised in the use of Integrated Environmental Management (IEM) tools for various Pre-feasibility and Feasibility assessments for various sectors. Through the use of IEM tools such as Basic Assessments, Scoping and Environmental Impact Assessments (EIAs), Vukosi has undertaken various applications for clients such as SANRAL, Eskom (Substations and Powerlines) and Johannesburg Roads Agency (Roads and Stormwater Dams).

b) Location of the overall Activity

Table 1:Description of the Property

Farm Name:	Various Farms as per the Table below
Application area (Ha)	3084,93 hectares
Magisterial district:	Lejweleputswa District Municipality
Distance and direction from nearest town	The pipelines will transect eight (8) properties as presented in the Table overleaf. The study area is located approximately 7 km north of Odendaalsrus, 3 km south of Allanridge and 26 km east of Wesselsbron.
21-digit Surveyor General Code for each farm portion	Various 21-digit Surveyor General Code as presented in the Table detailed below overleaf

Farm Name	Farm No	Portion	Latitude	Longitude	Title Deed	Surveyor General 21 digit code
Bandon	345	RE/0	27°48'29.43S	26°39'10.92E	T722/1967	F02400000000034500000
Dolly	404	0	27°50'23.7S	26°40'47.01E	T4442/1970	F02400000000040400000
Marthina's Gift	299	RE/0	27°49'21.71S	26°37'56.65E	T4442/1970	F02400000000029900000
Spes Bona	210	2	27°48'34.58S	26°38'16.97E	T13528/2010	F02400000000021000002
Spes Bona	210	3	27°49'14.8S	26°38'21.4E	T13528/2010	F02400000000021000003
Uitkyk	258	RE/0	27°47'15.89S	26°38'43.46E	T16564/1980	F02400000000025800000
Van Den Hevers Rust	410	RE/0	27°49'41.05S	26°38'54.88E	T13528/2010	F02400000000041000000
Weltevrede	205	2	27°48'13.62S	26°37'50.74E	T13528/2010	F02400000000020500002

c) Locality map

(Show nearest town, scale not smaller than 1:250000 attached)

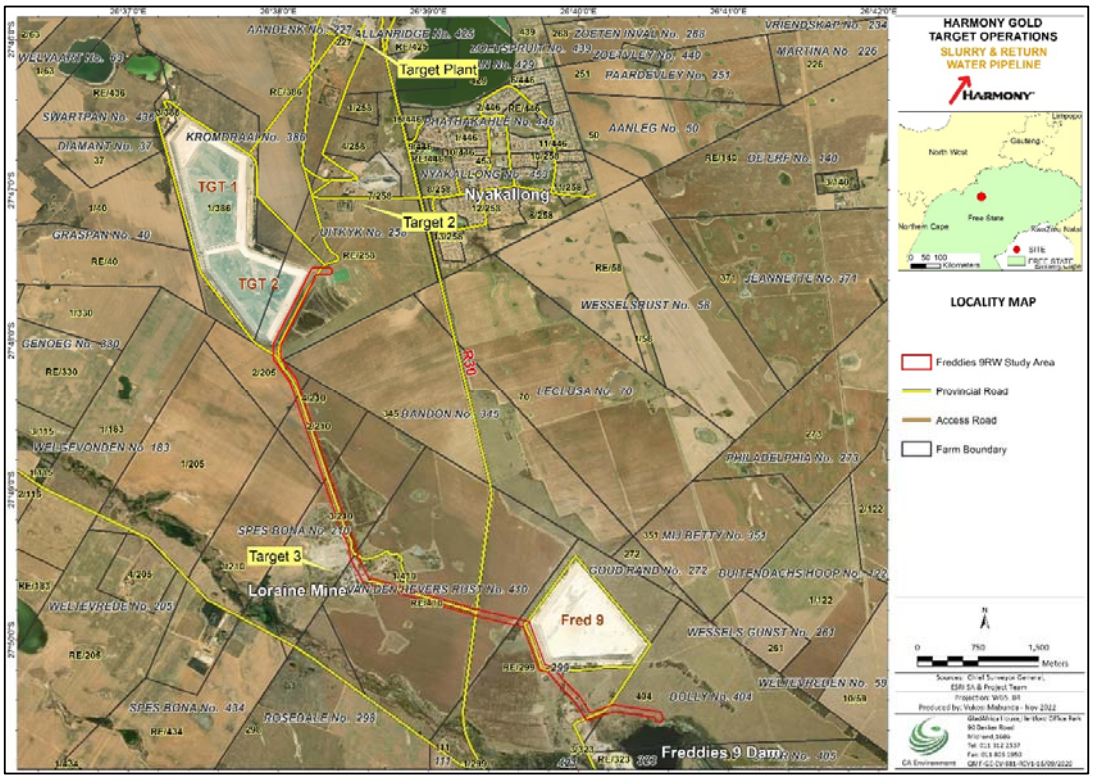

Figure 1:Project Locality Map showing Tailings Storage Facilities and mining operations owned by Harmony Gold

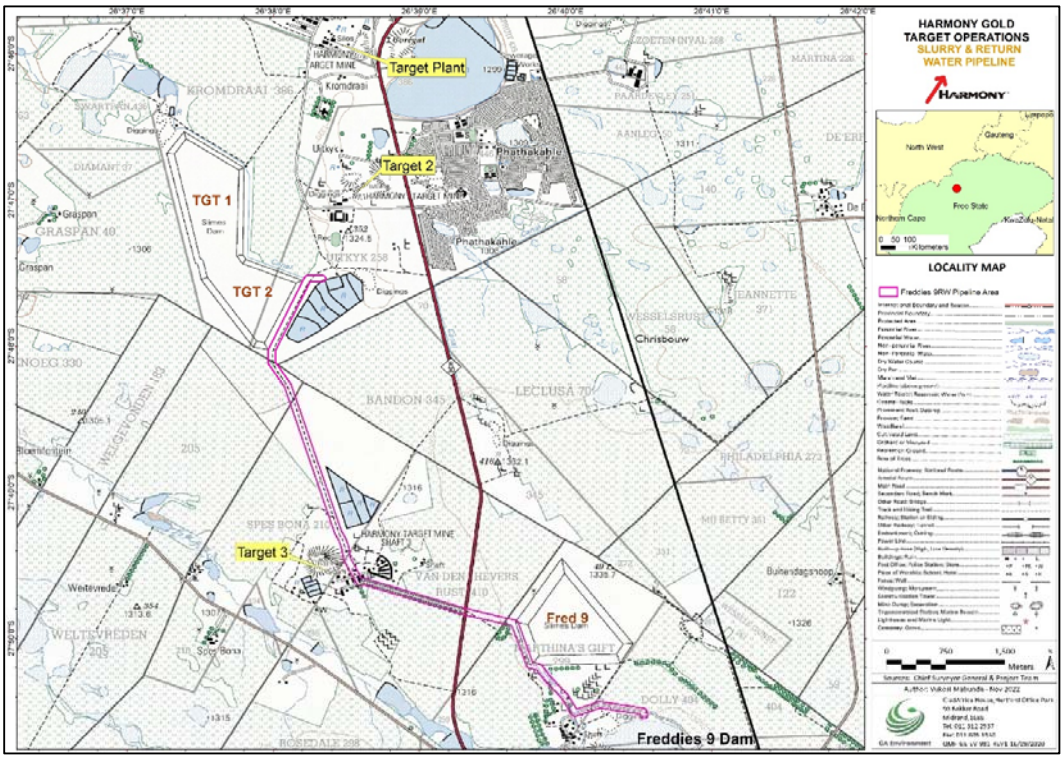

Figure 2: Topographic map showing the location of the proposed pipelines

d) **Description of the scope of the proposed overall activity.**

Provide 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.

Project Background and Description

Harmony Gold Mining Company Limited (Harmony) operates numerous gold mines in South Africa and has a concentration of mining activities in the Welkom-Virginia area of the Free State Province. Harmony's Target Operations, which are located in the vicinity of the town of Allanridge, Free State Province, comprise the following components:

- Target 1 Shaft;
- Target 2 Shaft;
- Target 3 Shaft (under care and maintenance);
- Freddie's Shaft and Freddie's Dam; and
- Target Plant.

Harmony is proposing to construct a new slurry and return water pipelines from its TGT 2 Tailings Storage Facility (TSF) in order to deposit tailings at the Freddies 9 TSF as Target 1 and 2 TSF have reached their final design height and have become unserviceable. The pipelines will be a flanged steel pipes installed above-ground on pre-cast concrete plinths. Examples of the proposed pipeline infrastructure and the surrounding TSF are presented in **Figures 3 – 7** on pages overleaf.

Figure 3: Example of a similar flanged pipeline that is proposed

Figure 4: Target 3 Shaft (under care and maintenance);

Figure 5: Tailing Storage Facility 2 which has reached their final design height and currently unserviceable

Figure 6: Picture showing the R30 where the pipeline will cross through a culvert

Figure 7: Freddie's Return Water Dam

The two pipelines will be installed parallel to each other. The proposed return water pipeline of about 8.3km long will starts from Freddies 9 Return Water Dam (RWD) with coordinates 27°50'31.66"S and 26°40'32.30" to TGT 2 TSF with coordinates 27°47'32.23"S and 26°38'20.25"E where it is connected to the existing pipelines towards the Target Plant. The two pipelines run parallel to each other along the proposed route as illustrated in **Figure 1**. One of the pipelines will transport tailings from the Target Gold Plant to the existing Freddies 9 TSF and the other pipeline will transport return water from Freddies Return Water Dam (RWD).

The proposed slurry pipeline will 5.6km in length and will have a diameter of 300mm and an average flow rate of 93 ℓ/s and will start from TGT 2 TSF to the Freddies 9 TSF. The return water pipe will have a diameter of 200mm with an average flow rate of 40 litres per second (ℓ/s).

Project Location

The proposed development is situated between the towns of Allanridge and Odendaalsrus and is 21 km north of the town of Welkom in the Free State Province. The proposed development site is located in Allanridge west of the Nyakallong Township, Matjhabeng Local Municipality within the district boundaries of Lejweleputswa District Municipality. The proposed pipelines are sited largely on Harmony-owned or municipal land.

The surrounding land uses consist predominantly of agricultural and mining areas, in addition to the associated mining infrastructure. The site centre geographic coordinates are 27°49'41.91" S, 26°38'48.29" E **(Figure 1** and **Figure 2).** The majority of the pipeline route is situated on existing disturbed land, such as mine access roads and existing infrastructure servitudes. The section of the pipeline route between the tailings storage facility and the R30 road traverses agricultural (cultivation) and natural land. The pipelines have been designed to be above-ground and will be placed on pre-cast concrete plinths, except where the route crosses the gravel access road and the R30. At the R30 crossing, the pipelines will run beneath the R30, through a culvert. It is proposed that an service and maintenance road with a maximum width of 3.5 m will be cleared and graded. This road is located adjacent to the pipeline route. The proposed return water pipeline of approximately 8.3km will starts from Freddies 9 Return Water Dam (RWD) at coordinates 27°50'31.66"S and 26°40'32.30" and heads northwest to immediately northeast of TGT 2 TSF at coordinates 27°47'32.23"S and 26°38'20.25"E. From this point, the pipeline will be connected to the existing pipelines towards the Target Plant. Site pictures are provided in Error! Reference source not found. to **11**.

Figure 8:Starting point of pipeline from Freddies 9 Return Water Dam in the background

Figure 9:Picture showing the existing gravel road which is located adjacent to the proposed pipeline

Figure 10:Picture showing artificial seep wetlands identified in the study area

Figure 11: End point of the proposed pipelines where they will be connecting to the existing pipelines linked to the TGT 2 Tailings Storage Facility shown in the background

i) Listed and specified activities

Table 2: Listed Activities in Terms of the NEMA EIA Regulations (2014) as amended

NAME OF ACTIVITY (All activities including activities not listed) **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)**	**Aerial extent of the Activity Ha or m²**	**LISTED ACTIVITY** **Mark with an X where applicable or affected.**	**APPLICABLE LISTING NOTICE (*GNR 544, GNR 545 or GNR 546)/NOT LISTED***
Construction of a new slurry and return water pipeline. The pipeline will be a flanged steel pipes installed above-ground on pre-cast concrete plinths. The two pipelines will be installed parallel to each other. Site preparation including clearing and grubbing will be undertaken.	4.9 ha Incl. of service and maintenance road and proposed pipeline infrastructure	Listing Notice 1: Activity 12 The development of: (ii) infrastructure or structures with a physical footprint of 100 square metres or more where such development occurs if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse. X	G.N.R 983

NAME OF ACTIVITY (All activities including activities not listed) (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (*GNR 544, GNR 545 or GNR 546)/NOT LISTED*
		Applicability The proposed footprint for the pipeline and service and maintenance road is located within 32m of identified wetlands and exceeds 100 square metres.	
	4.9 ha 4.9 ha Incl. of service and maintenance road and proposed pipeline infrastructure	Listing Notice 1: Activity 30 Any process or activity identified in terms of section 53(1) of the National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004). **X** Applicability The proposed activity will impact Vaal Vet sandy grassland regarded as endangered in terms of NEMBA.	G.N.R 983
	4.9 ha Incl. of service and maintenance road and proposed pipeline infrastructure	Listing Notice 1: Activity 21D Any activity including the operation of that activity which requires an amendment or variation to a right or permit as contemplated in section 102 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity contained in this Listing Notice or in Listing Notice 3 of 2014, required for such amendment **X** Applicability The project is proposed on an area with an existing mining right (Mining Right 225 and 226). The application process is therefore through an amendment application based on Section 102 of the Minerals and Petroleum Resources Development Act.	G.N.R 983
	4.9 ha Incl. of service and maintenance road and proposed pipeline infrastructure	Listing Notice 3: Activity 12 The clearance of an area of 300 square metres or more of indigenous vegetation (b) Free State (ii) Within critical biodiversity areas identified in bioregional plans;	G.N.R 985

NAME OF ACTIVITY (All activities including activities not listed) (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (*GNR 544, GNR 545 or GNR 546)/NOT LISTED*
		(iv) Areas within a watercourse or wetland; or within 100 metres from the edge of a watercourse or wetland. **X** Applicability Clearance of indigenous vegetation in the preparation of the construction footprint will result in a potential impact on critical biodiversity areas.	
	4.9 ha Incl. of service and maintenance road and proposed pipeline infrastructure	Listing Notice 3: Activity 14 The development of infrastructure or structures with a physical footprint of 10 square meters or more where the development occurs if no development setback has been adopted, within 32 meters of a watercourse measured from the edge of a watercourse (b) Free State (i)(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans **X** Applicability The proposed footprint for the pipeline and service and maintenance road is located within 32m of identified wetlands 10 square metres.	G.N.R 985

ii) Description of the activities to be undertaken

(Describe Methodology or technology to be employed, and for a linear activity, a description of the route of the activity

Activities associated with the construction of the pipeline

Pre-Construction Phase

- Site preparation
  - Site demarcation & Establishment
  - Demarcation of identified ‘’no go areas’’
  - Land clearing. (Only for the footprint of pipeline and service and maintenance road)

Figure 12: Example of installation of flanged steel pipeline above-ground on pre-cast concrete plinths

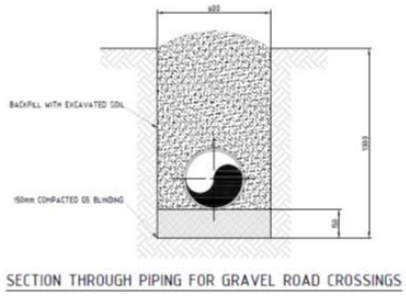

Figure 13: Picture showing cross section for piping through gravel road crossing

Construction Phase

Activities associated with the construction phase are provided below:

- Excavations
  - Material will be excavated **only** from the gravel road crossing sections and section of the R30 were the culvert will be installed for the pipe crossing.
- Laying of Concrete plinths
  - The concrete plinths will be laid on the cleared and levelled areas
- Laying of steel pipeline and flange bolting
  - Laying of steel pipe according to the pipeline route as per the approved design
  - Align flanges and gasket, apply lubrication and tighten stud bolts
- Development of service and maintenance road
  - The service and maintenance road will be cleared / graded adjacent to the pipeline route, with a maximum width of 3.5 m.
  - This service and maintenance road may include the placement of gravel in sections, with a thickness of 0 mm to 0.75 mm.
- Stockpiling
  - Specific stockpiles for overburden and topsoil removed during excavation for gravel road and R30 crossings and clearance and levelling for the service and maintenance road

Access Roads

The existing mine gravel road leading to the site will be used for the haulage of the steel pipeline and pre-cast concrete plinths. No new access roads will be constructed for the haulage of material to the respective sites as access to site already exists. The potential impacts resulting from the haulage of material to the respective sites has also been addressed in this Basic Assessment. Internal access roads within the project footprint will follow existing access tracks. Potential environmental impacts associated with the internal access roads have been considered in this report. The construction of the pipeline will also include the development of service or maintenance roads that will be used during the operation phase of the project. Potential impacts from the minor road establishment activities have been considered in this Basic Assessment.

Stormwater Management

The above-ground pipeline will not require any major stormwater infrastructure to mitigate post-development stormwater increases. This is because the proposed new works do not increase the post-

development surface runoff. The portion of the proposed works that comprises of the culvert will be constructed under the R30.The above-ground pipe will then change direction vertically and travel through the culvert, under the R30, and then change direction vertically to continue above ground again. The site has the potential of natural drainage, and the post-development stormwater addition is addressed in the overall design.

A stormwater system for the proposed development is required for the collection, management, and control of stormwater run-off from the site. The general level of management required is that of controlling all runoff emanating from the site that is more than what would have occurred if the site were in its natural or original state. A stormwater management plan **(Appendix G)** has been compiled to support a Basic Assessment and WULA process for the project.

Waste Management

All waste generated during the construction of the pipeline will be temporarily stored at suitable locations (e.g.in receptables/skips) and will be removed at regular intervals and disposed of appropriately at a licensed municipal waste site or acceptable disposal facility located with reasonable distance to the site. The nearest landfill is in Allanridge and Harmony will follow the Municipal bylaws before disposal of any waste that will be generated during the construction phase of the project. The waste that will be temporary stored on site does not trigger the need to apply for a Waste Licence. Should Harmony consider the storage of about 100m3 of general waste, the applicable norms and standards for registration of a temporary storage facility will be followed.

Water and Sanitation

Sanitation services will be required for onsite personnel during the construction phase of the project. Chemical toilets will be used and serviced regularly by a registered Waste Contractor and disposal will be in accordance with Municipality By laws.

Rehabilitation and Closure

A Method Statement and rehabilitation plan will be developed for rehabilitation of laydown areas, access tracks and all disturbed areas. This Method Statement shall be submitted to the Engineer for approval prior to commencement, and that rehabilitation is included in the Contractor's programme including post monitoring, for at least for the first three months of monitoring**.**

- All infrastructure (site offices), equipment will be removed from site.
- All waste/rubble will be removed from site.
- Site Stabilisation
    - Modified areas will be ripped, revegetated, and grassed in order to blend with surrounding environment.

A rehabilitation plan or method statement for the wetlands or watercourses (if impacted) by the pipelines shall be compiled.

Operational phase

It is anticipated that Pipeline maintenance and repairs of the proposed pipeline project will be undertaken.

- Right-of-Way Clearing
    - An proposed pipe must have a clear path of travel in order to operate the most efficiently and uninhibited.
    - During right-of-way clearing, trees and roots are removed so that the land near pipes is free of the threats of these conditions.

    - It's also important that the right-of-way remains clear so that in the event of an emergency the pipeline is easily accessible for repair**.**
- Identifying Corrosion
    - Monitoring of pipes and flanges for any evidence of corrosion.
- Regular Inspections
    - Regular inspection of the pipeline to address maintenance issues that may arise.
    - Proactive inspections and using an experienced crew who knows what to look for and what to do based on their observations.

- Maintain Complete Records
    - Keep accurate maintenance records.
    - These records must include pictures.
    - This is important to highlight the condition of pipes at installation. It will also serve as an important baseline to determine how quickly the pipes are corroding.

e) Policy and Legislative Context

Table 3:Policy and Legislative Context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process);	**REFERENCE WHERE APPLIED**	**HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT** (e.g. In terms of the National Water Act a Water Use Licence has / has not been applied for)
Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996**)**	The environmental right is mentioned in Section 24 of the Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996). This states the following: "...*everyone has the right to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation, and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development*". The State must therefore respect, protect, promote, and fulfil the social, economic, and environmental rights of everyone and strive to meet the basic needs of previously disadvantaged communities. The Constitution therefore recognises that the environment is a functional area of concurrent national and provincial legislative competence, and all spheres of government and all organs of state must cooperate with, consult, and support one another if the State is to fulfil its constitutional mandate.	The Basic Assessment Process will ensure that the environmental right enshrined in the Constitution are protected and the Environmental Authorisation or EMPr issued thereafter contributes to the protection of the biophysical and socio- economic environment
National Environmental Management Act, 1998 (Act No. 107 of 1998)	In order to bring section 24 of the Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996) into realisation, the National Environmental Management Act, 1998 (NEMA) (Act No. 107 of 1998) was promulgated to serve to *'provide for co-operative environmental governance by establishing principles for decision-making on matters*	The proposed pipeline development will result in potential impacts on identified wetlands and vegetation that will trigger listing activities from Listing Notice 1 & 3 as provided in **Table 2**. This report is a Basic Assessment as required

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process);	**REFERENCE WHERE APPLIED**	**HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT** (e.g. In terms of the National Water Act a Water Use Licence has / has not been applied for)
	affecting the environment, institutions that will promote cooperative governance and procedures for co-ordinating environmental functions exercised by organs of state; to provide for certain aspects of the administration and enforcement of other environmental management laws; and to provide for matters connected therewith'. Chapter 5 of NEMA outlines the general objectives and implementation of Integrated Environmental Management (IEM), which provides a framework for the integration of environmental issues into the planning, design, decision-making and implementation of plans and development proposals. Section 24 provides a framework for granting of Environmental Authorisations. In order to give effect to the general objectives of IEM, the potential impacts on the environment of listed activities must be considered, investigated, assessed, and reported on to the competent authority. Environmental Impact Assessment (EIA) Regulations were promulgated in December 2014 (as amended) in terms of Section 24(5) and Section 44 of the National Environmental Management Act (NEMA), Act 107 of 1998. . In terms of the 2014, EIA Regulations the triggered listed activities fall under Listing Notices 1, 2 and 3 which are further discussed as follows: • *Listing Notice 1 (Regulation 983) define activities which will trigger the need for a* ***Basic Assessment process.*** • *Listing Notice 2 (Regulation 984) define activities which trigger a* ***Scoping and Environmental Impact Assessment (EIA) process****.*	

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process);	**REFERENCE WHERE APPLIED**	**HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT** (e.g. In terms of the National Water Act a Water Use Licence has / has not been applied for)
	• *Listing Notice 3 (Regulations 985) refers to certain listed activities located in specifically defined geographical areas for which a **Basic Assessment process** would be required.*	
National Environmental Management Act, 1998 (Act No. 107 of 1998). Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(A) and (H) and 44 of the National Environmental Management Act (NEMA; Act No 107 of 1998) when Applying for Environmental Authorisation.	Specialist reports are required to be undertaken in line with Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(A) and (H) and 44 of the National Environmental Management Act (NEMA; Act No 107 of 1998) when Applying for Environmental Authorisation	These procedures were applied in the identification and undertaking of Specialist Assessments
Department of Forestry, Fisheries and the Environment Screening Tool	On 5 July 2019, The Department of Forestry, Fisheries and the Environment (DFFE) gave Notice of the Requirement to submit a Report generated by the National Web-based Environmental Screening Tool in terms of section 24(5)(h) of the NEMA, 1998 (Act No 107 of 1998) and regulation 16(1)(b)(v) of the EIA regulations, 2014, as amended. The submission of this report is compulsory when submitting an application for environmental authorisation in terms of regulation 19 and regulation 21 of the Environmental Impact Assessment Regulations, 2014 effective from 4 October 2019.	A site visit was undertaken in May 2022, and the Screening Tool report was generated in July 2022. A copy of the DFFE Screening report is provided in **Appendix I** of this report.
National Environmental Management: Waste Act 59 of 2008 (Act No. 59 of 2008)	This Act aims to regulate waste management to protect human health and the environment by putting measures in place to prevent pollution and ecological degradation; promote conservation; and secure	A waste licence **is not** required for the proposed activity. The general principles of responsible waste management will be

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process);	**REFERENCE WHERE APPLIED**	**HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT** (e.g. In terms of the National Water Act a Water Use Licence has / has not been applied for)
	ecologically sustainable development and use of natural resources. The Applicant shall ensure compliance with this Act by implementing practical measures to avoid or reduce unnecessary generation of waste and where the waste is generated measures such as re-using, recycling and recovery of waste shall be encouraged.	incorporated in the EMPr to manage waste related activities during construction and operational phase of the project. Applicable Waste Municipality Bylaws will be considered where necessary during the construction phase.
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	The purpose of this Act is to provide for the: • Management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act,1998; • The protection of species and ecosystems that warrant national protection; • The sustainable use of indigenous biological resources; • The fair and equitable sharing of benefits arising from bio-prospecting involving indigenous biological resources; • The establishment and functions of a South African National Biodiversity Institute • Chapter 7 of the NEMBA regulations govern the 'PERMIT SYSTEM FOR LISTED THREATENED OR PROTECTED SPECIES'. In order to remove or relocate any Threatened species or Protected species identified on the site, the relevant permits must be applied for.	A Terrestrial Biodiversity Assessment was undertaken by The Biodiversity Company. According to SANBI database the area is known to have Vaal Vet sandy grassland which is an *endangered* species. The desktop and field studies dispute the 'Very High' sensitivity presented by the screening tool report, as irrelevant to the proposed footprint areas. The proposed footprint area is largely degraded. No floral or faunal TOPS were recorded within the project area. The proposed project will however include the removal of indigenous vegetation. The recommendations and mitigation measures as provided by the specialist has been included in the EMPr.

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National Forests Act, 1998 (Act No 84 of 1998)	The purpose of the Act is to promote the sustainable management and development of forests and to provide protection for certain forests and trees in terms of: • Section 15 (1) of the National Forest Act (Act 84 of 1998), any person wishing to cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree must apply for a license from the Minister or any delegated institution or authority. • Government Notice 38215, Notice of the List of Protected Tree Species under the National Forests Act, 1998 (Act No 84 of 1998) was gazetted in November 2014.	No protected trees or SCC flora species were observed.
National Water Act, 1998 (Act No. 36 of 1998)	The National Water Act, 1998 (Act No. 36 of 1998) aims to provide for management of the national water resources in order to achieve sustainable use of water for the benefit of all water users. This act requires that the quality of water resources is protected as well as the integrated management of water resources with the delegation of powers to institutions at the regional or catchment level. The purpose of the Act is to ensure that the nation's water resources are protected, used, developed, conserved, and managed in ways which take into account: • Meeting basic human needs of present and future generations; • Promoting equitable access to water; • Redressing the results of past racial discrimination;	A Freshwater Wetland/Riparian Assessment was undertaken for the proposed development. Two (2) HGM type of wetland were identified and delineated for this assessment, namely seepage wetlands and depressions. No river systems were identified within the 500 m regulated area. The proposed pipeline route is also located within the regulated area of identified watercourses. In terms of the National Water Act (NWA), 1998 (Act No. 36 of 1998), a Water Use Authorization (WUA) will be required prior to commencing with the activity. The water

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process);	**REFERENCE WHERE APPLIED**	**HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT** (e.g. In terms of the National Water Act a Water Use Licence has / has not been applied for)
	• Promoting the efficient, sustainable and beneficial use of water in the public interest; facilitation social and economic development; • Providing for the growing demand for water use; • Protecting aquatic and associated ecosystems and their biological diversity; • Reducing and preventing pollution and degradation of water resources; • Meeting international obligations; • Promoting dam safety; and • Managing floods and drought. In pursuit of these objectives, Chapter 4 of the act regulates water use, while Section 21 lists eleven water use types that are regulated [Section 21 (a) – (k)]. Watercourses and wetlands are protected in terms of this section, as both are regarded as water resources. The list of the regulated areas inclusive of the 500m distance, but specific to the delineated boundary are as follows: • *The outer edge of the 1:100 year flood line and /or delineated riparian habitat whichever is the greatest measured from the middle of a river, spring, natural channel, lake or dam;* • *In the absence of a determined 1:100 year flood line or riparian area, the area within 100m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench (subject to compliance to section 144 of the Act);* • *500m radius from the delineated boundary of any wetland or pan.*	uses (*c) impeding or diverting the flow of water in a watercourse; (i) altering the bed, banks, course or characteristic of a watercourse* has already been confirmed following consultation with the Department of Water and Sanitation. A Water Use License Application has been lodged to authorise the identified Section 21c water uses associated with the development and operation of the pipeline.

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National Environmental Management Air Quality Act (Act 39 of 2004)	The purpose of the act is to reform the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incidental thereto. Section 32 of the Act relates to the control of dust and Section 34 of the Act relates to the control of Noise. National Environmental Management Air Quality Act (Act 39 of 2004- *Category 2: Subcategory 2.4: Storage and handling of Petroleum Products* *National Dust Control Regulations (2013)*	The principles provided in Section 32 and 34 of the Act has been included in the EMPr, in order to manage and minimise dust and noise related activities generated during the construction and operational phase of the project. Based on the information provided, an Air Emission Licence is not required as the anticipated dust that will be released will be managed through the National Dust Control Regulations (2013). The mine already dust monitoring within the mine area
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	The objective of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) is to introduce an integrated system for the management of national heritage resources. The identification, evaluation and assessment of any cultural heritage site, artefact or find in South Africa is required by this Act. Section 38 of this Act pertains to Heritage resources management and Section 38(1) states the following *Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as—* *(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;*	Based on the triggered activities in Section 38 of the Act, a Heritage Impact Assessment has been undertaken for the proposed development. No sites, features or objects of cultural significance were identified. No further permits or approvals are required with respect to this Act.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process);	**REFERENCE WHERE APPLIED**	**HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT** (e.g. In terms of the National Water Act a Water Use Licence has / has not been applied for)
	(b) the construction of a bridge or similar structure exceeding 50 m in length; *(c) any development or other activity which will change the character of a site—* *(i) exceeding 5 000 m^2 in extent; or* *(ii) involving three or more existing erven or subdivisions thereof; or* *(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or* *(iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;* *(d) the re-zoning of a site exceeding 10 000 m2 in extent; or* *(e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,* *must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature, and extent of the proposed development.*	
Mineral and Petroleum Resource Development Act 28 of 2002	The purpose of the Act is to regulate the prospecting for and the optimal exploitation, processing and utilization of minerals; to regulate the orderly utilization and the rehabilitation of the surface of land during and after prospecting and mining operations; and to provide for matters connected therewith. In terms of Section 22 of the Act, a Mining Right must be obtained prior to the commencement of any mining activities.	It is noted that in terms of Section 102 of the MPRDA, the Mining right holder must apply for an amendment of its right to address environmental impacts. The application is therefore an amendment to Mining right 226. The proposed Pipeline development is approximately 88% within Mining Right 226, whereas only 12% of the proposed pipeline falls within MR 225 where the new pipelines tie into the existing pipelines already located on

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process);	**REFERENCE WHERE APPLIED**	**HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT** (e.g. In terms of the National Water Act a Water Use Licence has / has not been applied for)
		Mining Right 225. Therefore, the application is for the amendment of MR226 as the majority of impacts will be on MR226
Spatial Planning and Land Use Management Act (Act No. 16 of 2013) (SPLUMA)	SPLUMA is a framework act for all spatial planning and land use management legislation in South Africa. It seeks to promote consistency and uniformity in procedures and decision-making in this field. SPLUMA will also assist municipalities to address historical spatial imbalances and the integration of the principles of sustainable development into land use and planning regulatory tools and legislative instruments.	The site earmarked for development is currently zoned as Mining Agricultural. The applicability of SPLUMA will considered where relevant.
Mining and Biodiversity Guidelines (2012)	The intention of the guideline is to find a balance between economic growth and environmental sustainability (i.e., in the name of sustainable development). The Guideline is envisioned as a tool to "foster a strong relationship between biodiversity and mining which will eventually translate into best practice within the mining sector." In identifying biodiversity priority areas which have different levels of risk against mining, the Guideline categorises biodiversity priority areas into 4 classes with the following levels of risk for mining attached to them: 1. Legally protected areas, where mining is prohibited 2. Ares of highest biodiversity importance, which are at the highest risk for mining 3. Areas of high biodiversity importance, which are at a high risk for mining Areas of moderate biodiversity importance, which are at a moderate risk for mining.	The mining and Biodiversity Guidelines (2012) indicate no areas of increased biodiversity importance is applicable to mining within the project area.
Mine Health and Safety Act 29 of 1996	To require employers and employees to identify hazards and eliminate, control and minimise the risks relating to health and safety at within the mine environment.	During construction and operation of the pipeline, the MHSA prescribes the Legal duties and responsibilities of the employer and steps

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process);	**REFERENCE WHERE APPLIED**	**HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT** (e.g. In terms of the National Water Act a Water Use Licence has / has not been applied for)
		that must be undertaken for incidents that must be reported in terms of the MHSA, regulations.
Occupational Health and Safety Act (85 of 1993), Major Hazard Installation Regulations (GNR 629, 30 July 2001).	Any use or ancillary activity that involves the storage or keeping of hazardous substances that may result in an installation being declared a major hazardous installation in terms of occupational health and safety law is not permitted, unless a risk management and prevention plan has been submitted by the owner, and the Municipality has given approval thereto.	It cannot be confirmed within the Environmental scope of work if the storage of hazardous material will be undertaken on site. It is strongly recommended that Harmony seek input from Health and Safety specialist with respect to the Matjhabeng Local Municipality bylaws.

f) Need and desirability of the proposed activities.

(Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the preferred location).

Target 1 and 2 TSF have reached their final design height and have become unserviceable. This has a direct impact on the Target operations and the continued employment of employees at the Target Operations.

In order to address this, the proposed pipeline must be developed between the existing pipelines located at Target 2 TSF and Freddies 9 TSF which has the capacity to receive tailings. This proposal will prevent TSF 1 and 2 from structure failure and ensure protection of communities and the immediate environment. If the application for amendment is not granted, this may result in a failure to secure deposition space for the Target plant and will result in closure of the operations that will have a negative socio-economic impact on local business and job losses. The proposed pipeline will ensure that tailings are transported to the Freddies 9 TSF which has the capacity to receive tailings material.

The proposed development is located within the mining area of Mining Right 226. In terms of condition 4.1 of MR 226, the terms of this right, may not be amended or varied without the written consent of the Minister. Harmony proposes to develop pipelines that are not detailed in the mine work programme. This application is also being submitted with respect to the triggered activities as identified in the NEMA EIA Regulations, 2014 as amended. Various listed activities have been identified and particularly activity 21D which triggers the need for a Basic Assessment, if any activity, *including the operation of that activity which requires an amendment or variation to a right or permit as contemplated in Section 102 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity contained in this Listing Notice 1 or in Listing Notice 3 of 2014, is required for such amendment.*

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

The location and proposed route for the pipeline is preferred due to the following reasons:

Preferred Site

- Only one site was considered (MR226) as the TSF 1 and 2 and the associated infrastructure (service roads, culvert, etc.,) are located in this specific mining area where the risks from TSF structural failure has been identified. The proposed pipelines should therefore be located in this mining site in order to effectively transport the tailings from the Target operations to Freddies 9 TSF and to further transport return water from the Freddies 9 dam for primary processing of a mineral. No alternative sites can be considered to address the current risk.

Route Alternatives

- The route considered is the shortest route alignment between TSF 2 and Freddies 9 TSF thereby ensuring there is less disturbance and impacts on the natural environment. The route is further regarded as technically feasible as it is easily accessible through existing mine roads and a direct route between TSF 2 and Freddies 9 TSF. This design has also accommodated the location of the two pipelines to be installed parallel to each other and will thus minimise costs as there are no bend points.
- The majority of the preferred pipeline footprint is located within transformed low sensitivity vegetation.

Technology Alternative

- The development will consider the use of above ground Flanged steel pipeline that supported by concrete plinths instead of buried pipelines that interact with the soil. Pipelines are subjected to additional loads transmitted by the movement of the ground. Mining is temporary and an above ground pipeline presents a short-term solution and can easily be dismantled and decommissioned without causing impact to the environment.
- Flanged steel pipeline because it retains its strength and stiffness characteristics, regardless of age, steel pipe can be relied upon to maintain its original performance over

generations including the risks of corrosion due to internal (slurry) and external weather conditions. Steel pipelines still operating in the area with over 50 years of service, are a real testimony to this capability.

- Steel pipe is able to absorb shock loadings transmitted due to surface vibrations, pressure surges, as well as those that may be experienced during handling and installation.
- Through its ductility, steel pipe is able to locally yield and plastically deform under extreme load while maintaining resistance to that load. By contrast, the load response of plastic-based products is time and temperature dependent. Plastics are strain rate sensitive under load and are subject to creep at ambient temperatures. Stresses caused by unforeseen loads including impact, earth movement, washouts and extreme temperature changes can readily be accommodated.
- Service performance can thus be maintained in such conditions
- Welded joints provide total structural integrity and eliminate the need for thrust blocks. Rubber ring joints allow simple, rapid construction and provide a capacity for minor changes in alignment and settlement.

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

NB!! – This section is about the determination of the specific site layout and the location of infrastructure and activities on site, having taken into consideration the issues raised by interested and affected parties and the consideration of alternatives to the initially proposed site layout.

(i) Details of the development footprint alternatives considered.

With reference to the site plan provided as Appendix 4 and the location of the individual activities on site, provide details of the alternatives considered with respect to:

(a) the property on which or location where it is proposed to undertake the activity.

Only one site was considered (MR226) as the TSF 1 and 2 and the associated infrastructure (service roads, culvert, etc.,) are located in this specific mining area where the risks from TSF structural failure has been identified. The proposed pipelines should therefore be located in this mining site in order to effectively transport the tailings from the Target operations to Freddies 9 TSF and to further transport return water from the Freddies 9 dam for primary processing of a mineral. No alternative sites can be considered to address the current risk... According to the design engineers, the preferred pipeline route was considered the only technically feasible development footprint based on the reasons provided in **Section G** and the servitude and property ownership considerations in **Table 4** below.

Table 4: Servitude and property ownership considerations

Pipeline Section	Description
1	Starts at Freddies 9 RWD Pump it follows existing mining services where there are only Eskom servitudes to the north.
2	From the R30 crossing to the boundary of the Harmony land there where there is a surface lease in place.
3	From R30 crossing to Target 3 where it follows the access road (south side). At the R30 crossing a wayleave approval has been obtained from the Free State Roads Department.
4	From Target 3 to TSF 2 it follows the existing mine services located on Harmony Land and connects to the existing pipeline.

The site is considered to be adequately sized with various modified and transformed areas to allow for stockpiling of material. The majority of the site is surrounded by mining and cultivated land as shown on the land use and land cover maps presented as **Figure 14.** The proposed route traversing vacant unclassified land has been mostly transformed. The proposed pipeline route is conveniently designed to align with the existing access roads and avoids the majority of servitudes. There are certain sections of the pipelines that will be located within an approved in Eskom powerline servitude.

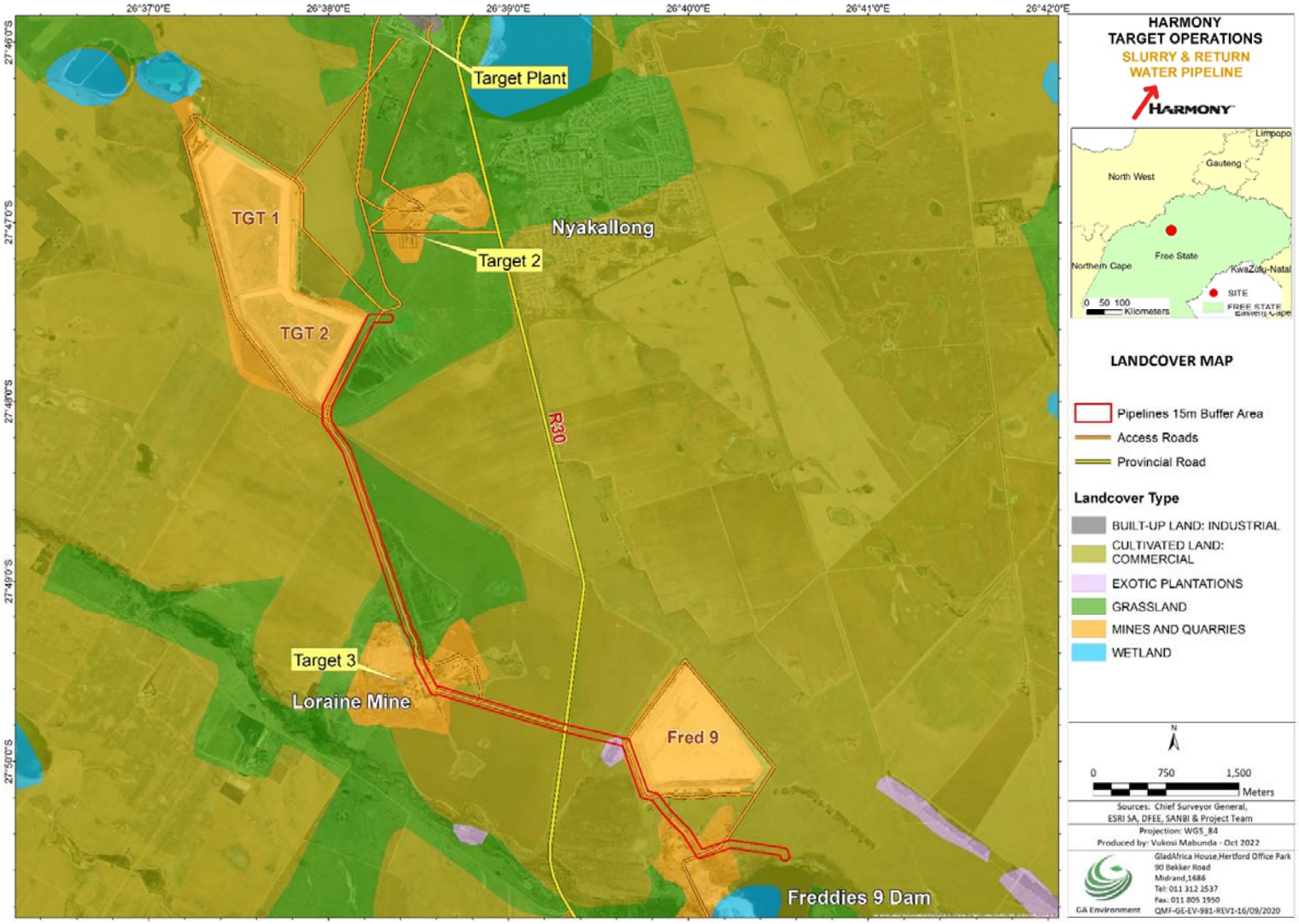

Figure 14: Land Cover Map for the proposed pipeline

(b) the type of activity to be undertaken

The application for Environmental Authorisation is based on the need to develop a pipeline that will safely transport slurry/tailings from the Target Operations to the Freddies 9 TSF which has the capacity to receive tailings material. The TSF 1 and 2 are under strain and have reached their design life and therefore present a risk of TSF failure which will negatively impact on the lives and property of the surrounding community, the ecological environment (vegetation, wetlands and fauna). The need for this pipeline defines the activity to be undertaken which is construction/installation of a pipe, therefore no activity alternatives were assessed during the Basic Assessment Process.

(c) the design or layout of the activity.

Only one route alternative as proposed was considered feasible. The intention of the proposed development is to locate the pipelines within the Harmony owned land and avoid impacts on existing servitudes. It is further a proposal that the development follow the shortest route and direct alignments between TSF 2 and Freddies 9 TSF thereby limiting disturbance and impacts on the natural environment. The majority of the preferred pipeline footprint is located within a transformed low sensitivity vegetation.

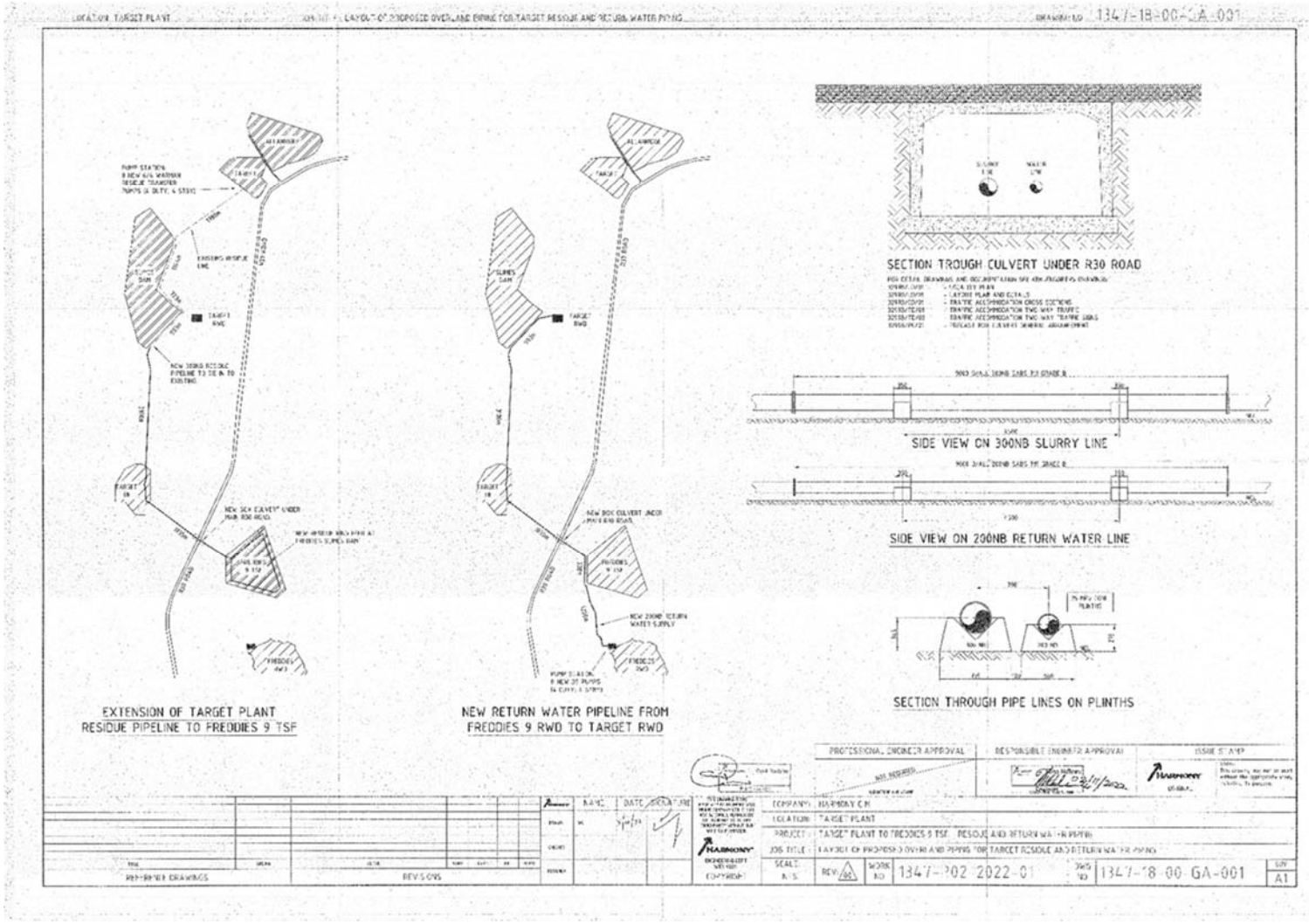

Figure 15: Slurry and Return Water Pipeline design layout

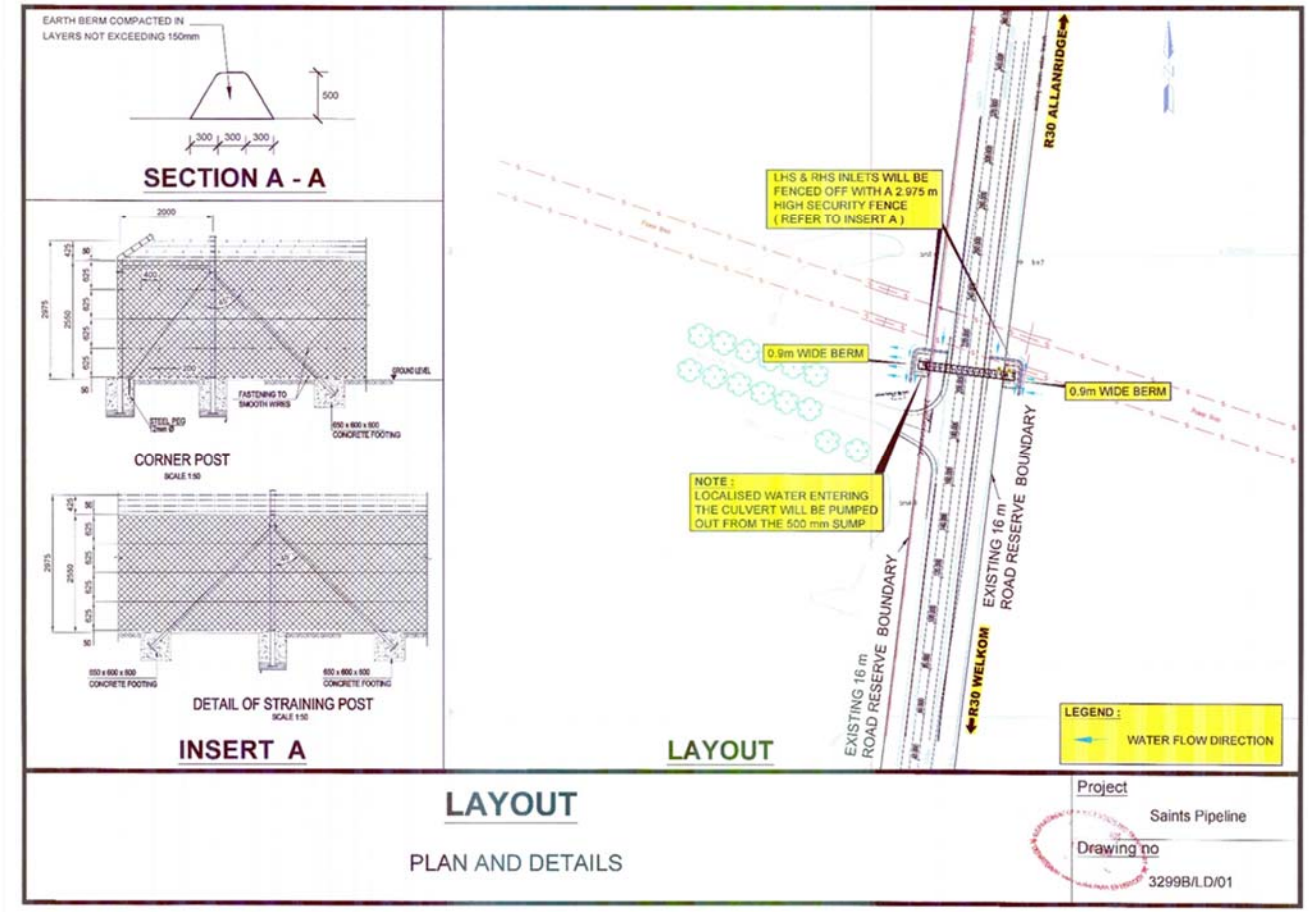

Figure 16: Layout plan for Box Culvert crossing at R30

(d) the technology to be used in the activity

Two options were considered as technology alternatives:

Table 5: Advantages and Disadvantages of the alternatives Considered

Steel Pipe	HDPE/PVC pipes
Advantages • Stainless steel is able to withstand larger temperature fluctuations as it expands far less than plastic or HDPE pipes. • Easy to maintain resulting in less operational requirements and a reduced downtime in the event of pipeline failure. • Retains strength and stiffness characteristics, regardless of age. Steel pipe can be relied upon to maintain its original performance over generations including the risks of corrosion due to internal (slurry) and external weather conditions. Disadvantages • Very expensive to procure and transport	Advantages • Excellent resistance to corrosion as it does not rust. • Easy to transport, store and install • Survival of settlement and movement that can cause fracturing of joints Disadvantages • High Thermal expansion and therefore susceptible to temperature changes which often leads to pipe failures. • Difficult to maintain often requiring replacement of entire pipe to address pipe failure • Highly Flammable.

(e) the process to be used in the activity

Two options were considered as process alternatives:

Table 6: Advantages and Disadvantages of the alternatives Considered

Above ground Installation	Underground Installation
Advantages • Easier to install, typically requiring no excavation • Easy to maintain and monitor potential spillages Disadvantages • exposed to the elements, which carries a higher risk of damage from weather or fire • Exposed to vandalism	Advantages • economising on space allowing the land to be used for other activities • No visual impact as it is hidden from the public Disadvantages • Difficult to maintain • High installation costs • Direct impacts on mortality of species beneath the ground

(f) the operational aspects of the activity; and

No alternatives were considered for the operational aspects of the pipeline as the proposed pipeline design is in line with the existing above ground pipes located in the area and its operation will be managed as per the existing pipelines which form part of the approved Mine plan and programme.

(g) the option of not implementing the activity.

The option of not implementing the activity is referred to as the No-Go alternative. The Potential Impacts as discussed in **Section vii** would not materialise. The implications of implementing the no-go alternatives are as follows:

- TSF structure failure will also impact on the surrounding ecological and social environment and will thus directly affect the remaining floral and faunal species. The surrounding dams, groundwater sources, and other catchments in the area will also be contaminated.

- Loss of jobs as at the Target Operations due to a halt in its operations
- The direct economic benefits associated with the development of the pipeline such as the employment of local labour. Furthermore, any possible indirect economic benefits (related to the procurement of goods and services from local subcontractors and the spending power of employees) would not materialise.
- The No-Go alternatives assumes that the project as proposed does not go ahead and the status quo remains as is and the risk associated with structural failure remains and expose the surrounding communities to health and safety risks thereby exposing Harmony to litigation issues and unnecessary costs

(ii) Details of the Public Participation Process Followed

Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings. (Information to be provided to affected parties must include sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land.

The NEMA (1998) EIA Regulations, 2014, as amended, prescribe that the Basic Assessment process must include the undertaking of public participation in accordance with the Chapter 6 of the Regulations. The purpose of the Public Participation Process is to provide all potential and / or registered Interested and Affected Parties (I&APs hereafter), including the competent authority and any other stakeholder or organ of state, an opportunity to become involved in the Basic Assessment process and provide comments during the various phases of the project. Involvement by I&APs is critical, as it contributes to a better understanding of the proposed project among I&APs, raises important issues that need to be assessed and provides local insight that will enhance the Basic Assessment process. This Section of the report provides details on the Public Participation Process followed during the Basic Assessment for the proposed project.

i. Identification of Interested and Affected Parties

Interested and Affected Parties (I&APs) were identified through various means from the inception phase of the project. These means included the consultation of adjacent landowners, a meeting with the ward councillor on 11 July 2022, the placement of an advertisement in a local newspaper, the placement of Site Notices and the distribution of Notification Letters. A pre-application meeting was held with representatives of The Department of Mineral Resources and Energy (DMRE) on the 7th of September 2022 to consult on the application process to be followed, the forms and templates to be used and specific requirements from DMRE. The conclusion of the meeting was that the application should still follow the amendment route of the existing MR 226. Minutes of the meeting are attached as **Appendix F**.

Other stakeholders with the areas such as the neighbouring property owners, the Ward Councillors and representatives from the Local Municipality were also informed of the proposed development. The list of the I& APs is attached as **Appendix E5.**

ii. Notification Letters

Regulation 41(2)(b) of the NEMA (1998) EIA Regulations, 2014, as amended requires that written notification be given to various parties who include the following:

> *(i) the occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;*
> *(ii) owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;*
> *(iii) the municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area;*
> *(iv) the municipality which has jurisdiction in the area;*
> *(v) any organ of state having jurisdiction in respect of any aspect of the activity; and*
> *(vi) any other party as required by the competent authority*.

An example of the notification letter that was compiled for the proposed development is attached as **Appendix E1.** The document provided a background on the project, the proposed activities as well as information on how one can register as an Interested and Affected Party (I&AP) on the project in order to be able to be kept abreast of all developments. Notification letters were compiled and distributed to all adjacent landowners on the 11th of July 2022. Knock and Drop Registers were also completed for all I&APs that received a notification letter on the aforementioned date. The knock and drop register has

been attached to **Appendix E1**. Electronic versions of the notification letters have also been sent to I&APs. These letters are still distributed to newly identified I&APs on an ongoing basis.

iii. Newspaper Advertisement

Regulation 41(2)(c) and (d) of the NEMA (1998) EIA Regulations, 2014, as amended requires that PPP includes the placement of a Newspaper Advertisement to notify all potential I&APs about the proposed project and to invite them to register as I&APs and provide comments on the project. An advertisement was published in the Vista Newspaper on the 21stst of July 2022.The proof of the placement of the Newspaper Advertisement is attached as **Appendix E2.**

iv. Notice Boards/Site Notices

In accordance with the NEMA (1998) EIA Regulations, 2014, as amended, a notice board detailing the proposed activity as well as the contact details of the EAP was placed on site. Site notices presenting the project were erected on site and at visible and accessible locations close to the site on the 11th of July 2022. The locations of the placement of the A2 notices as well as the A3 notices are as follows and provided in **Appendix E3.**

Table 7: Placement of site notices

NR.	Address/Place	Latitude	Longitude	Size
1.	Allanridge Post Office	27°44'53.33"S	26°38'38.21"E	A3
2.	Allanridge Public Library	27°45'1.58"S	26°38'38.83"E	A3
3.	Harmony Gold Target Operations Main Entrance	27°45'32.17"S	26°38'31.73"E	A2
4.	Allanridge Mini Market	27°45'36.53"S	26°38'44.04"E	A3
5.	Nyakallong Entrance (R30)	27°46'40.47"S	26°38'52.19"E	A2
6.	Matjhabeng Local Municipality Offices	27°46'33.43"S	26°39'0.60"E	A2
7.	Nyakallong Public Library	27°46'37.65"S	26°39'26.83"E	A3
8	Harmony Gold Target Operations 2	27°47'3.25"S	26°38'56.36"E	A2
9.	Proposed Pipelines joining point	27°47'32.33"S	26°38'15.76"E	A2
10.	Proposed Pipelines Route	27°48'5.22"S	26°37'59.63"E	A2
11.	Pipelines R30 Road Crossing	27°49'48.88"S	26°39'18.80"E	A2
12.	Freddies 9 TSF Dam	27°50'58.89"S	26°40'26.44"E	A2

v. Availability of Draft Basic Assessment Report (DBAR) for review

The DBAR will be issued out for public review for a legislated period of 30 days. The Public review period will commence on the 1st of December 2022 and end on 23rd of January 2023. The DBAR will be made available for public review at the Nyakallong Community Library and on GA Environment's website. Registered I&APs will be notified via email or SMS. The provision of the DBAR for review will allow I&APs adequate time to review the details of the project and provide, in writing, comments and concerns relating to the proposed development. The following commenting authorities will be provided with a copy of the report:

- The Department of Mineral Resources and Energy (DMRE)
- Free State Department of Economic, Small Business Development, Tourism & Environmental Affairs
- Lejweleputswa District Municipality.
- Matjhabeng Local Municipality
- Free State Department: Agriculture and Rural Development

- Free State Heritage Resources Authority
- South African Heritage Resources Agency
- The Department of Water and Sanitation
- Free State Department of Police, Roads and Transport

vi. I&APs Register and Comments & response report

From the onset of the project, a database of persons, organizations and organs of state identified as I&APs or registered as I&APs was opened and was updated as and when required. The I&APs register is included in **Appendix E5**. Comments received thus far from various I&APs have been captured in the Comments and Response Report. The Comments and Response report is attached to **Appendix E4**.

vii. Focus Group Meetings/Public Open Day

No public meeting or Focus group meeting was convened for the project. The need to undertake a public or a focus group meeting will be determined the public review process.

(iii) Summary of issues raised by I&APs

(Complete the table summarising comments and issues raised, and reaction to those responses)

The table below provides a summary of the stakeholders consulted to date. A high-level summary of the issues raised has been included on the table. All comments provided to date regarding the proposed project has been detailed in the comments and response report which is provided in **Appendix E4.**

Table 8: Issues Raised by I&APs

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.		**Date Comments Received**	**Issues raised**	**EAPs response to issues the applicant**
AFFECTED PARTIES				Responses are provided in the Comments and Response report attached to **Appendix E4**.
Landowner/s				
Not Applicable as they are the Applicant				
Lawful occupier/s of the land				
Not Applicable as they are the Applicant				
Landowners or lawful occupiers on adjacent properties				
Municipal councillor				
Councillor Clement Hanisi (Ward 36)	X	11th July 2022	• How will the proposed project add value to the community and employment opportunities. • Information to be provided on the timeframes of the project • When will the advertisements for the Contractor be placed out?	
Municipality				
Matjhabeng Local Municipality	X		No comments received to date	
Lejweleputswa District Municipality	X		No comments received to date	
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA e				
Department of Water and Sanitation	X		No comments received to date	
Free State Department of Police, Roads and Transport	X		No comments received to date	
Communities				

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.		Date Comments Received	Issues raised	EAPs response to issues the applicant
Traditional Leaders				
The Ward councillor confirmed that the were no traditional leaders within the ward.				
Dept of Environment				
Free State Department of Economic, Small Business Development, Tourism & Environmental Affairs	X		No comments received to date	
Other Competent Authorities affected				
Free State Department: Agriculture and Rural Development	X		No comments received to date	
Free State Heritage Resources Authority	X		No comments received to date	
South African Heritage Resources Agency	X		No comments received to date	
OTHER AFFECTED PARTIES				
INTERESTED PARTIES				

(iv) The Environmental attributes associated with the alternatives. (The environmental attributed described must include socio-economic, social, heritage, cultural, geographical, physical and biological aspects)

1. Baseline Environment

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

(Its current geographical, physical, biological, socio- economic, and cultural character).

This Section serves to describe the environmental setting of the area identified and will also provide a description of the overall character and other sensitivities that were identified in the surrounding environment. Information presented in this section has considered the input from the various specialist assessments undertaken during the Basic Assessment Process.

Climate

The climate of the region has typically hot summers and cold dry winters, with the highest temperatures occurring in December/January and the lowest in June/July (refer to **Figure 17**). Temperatures range from 34°C to -3°C. The area is predominantly dominated by winds directed from the northwest and are strongest in the afternoons. The month with the highest relative humidity is April (55.61 %). The month with the lowest relative humidity is September (30.83 %). The month with the highest number of rainy days is January (12.60 days). The month with the lowest number of rainy days is July (1.07 days). Allanridge is influenced by the local steppe climate. In Allanridge, there is little rainfall throughout the year. According to Köppen and Geiger, this climate is classified as BSk. The average annual temperature is 17.8 °C in Allanridge. The annual rainfall is 584mm.

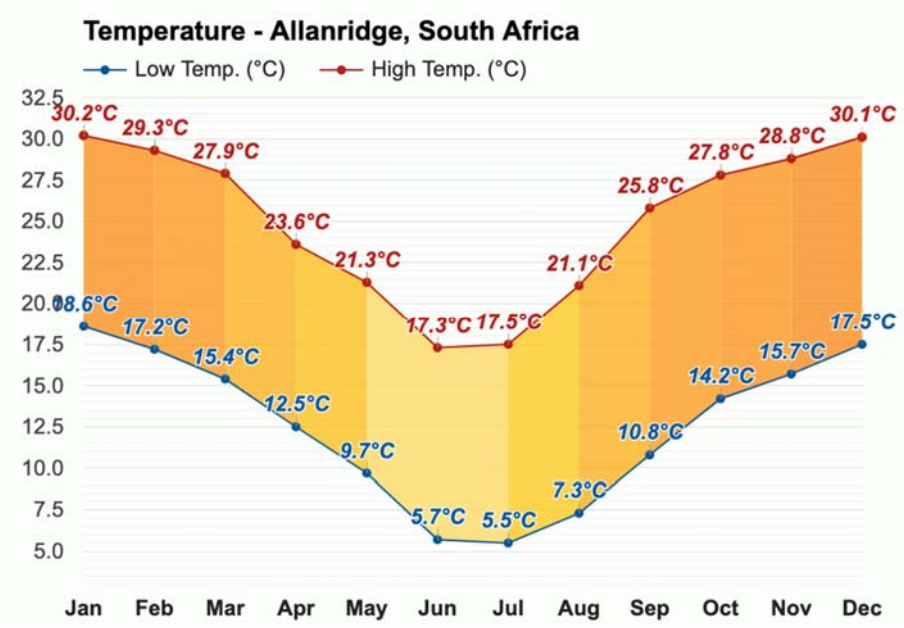

Figure 17: Average temperature for Allanridge (weather-atlas)

Thunderstorms mainly occur at the Target Operations in summer from October to April, with the wettest period falling between November and March. The dry season occurs between May and September. The available mean monthly and annual rainfalls for the period 1985 to 2013 at the Target Operations are presented in **Figure 18**.

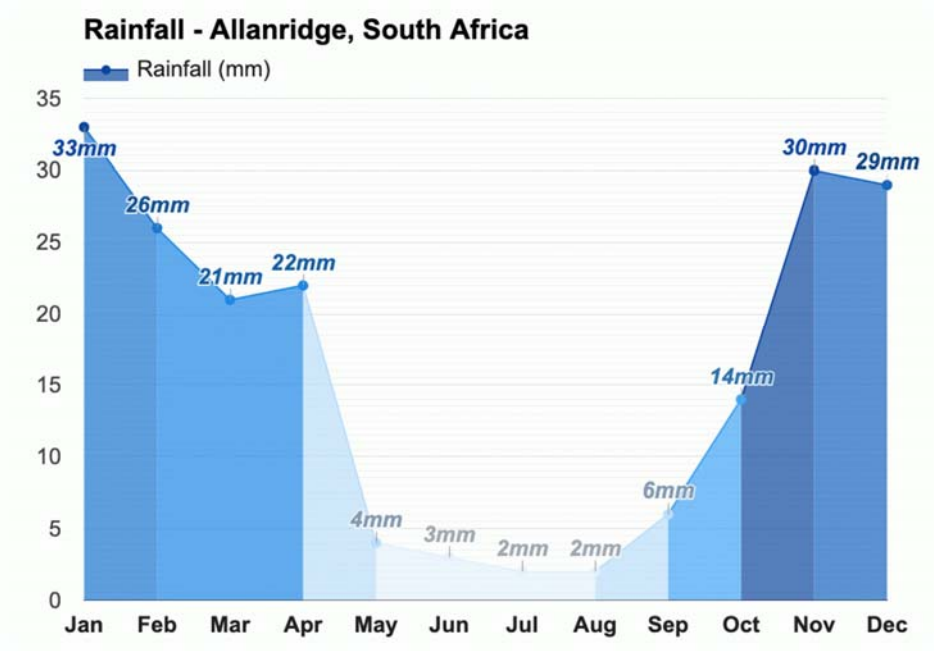

Figure 18: Average Rainfall for Allanridge (weather-atlas)

Topography

The project area is located at an average of 1316 metres above mean sea level (m.a.m.s.l.) with a maximum elevation of 1323 meters at the Freddies 9 TSF and the lowest elevation of 1311 meters as you approach TSF 2 where the pipe is connected to the existing pipelines. Please refer to **Figure 19**.

Figure 19: Google Earth elevation profile through the project area shown from South to North

Geology

According to the Kroonstad 2726 Geological Map Sheet (Council for Geosciences), the area is underlain by Aeolian sand with red-yellow apetal, freely drained soils (**Figure 20**). Aeolian sands are fine to medium, non-plastic and uniformly graded materials present in many sandy sites, mainly in desert areas. Soil colour is produced by the minerals present and by the organic matter content. Yellow or red soil indicates the presence of oxidized ferric iron oxides. Poorly drained soils are often dominated by blue-grey colours often with yellow mottling. Well drained soils will usually have bright and uniform colours. The geology and soils map is presented on **Figure 20**.

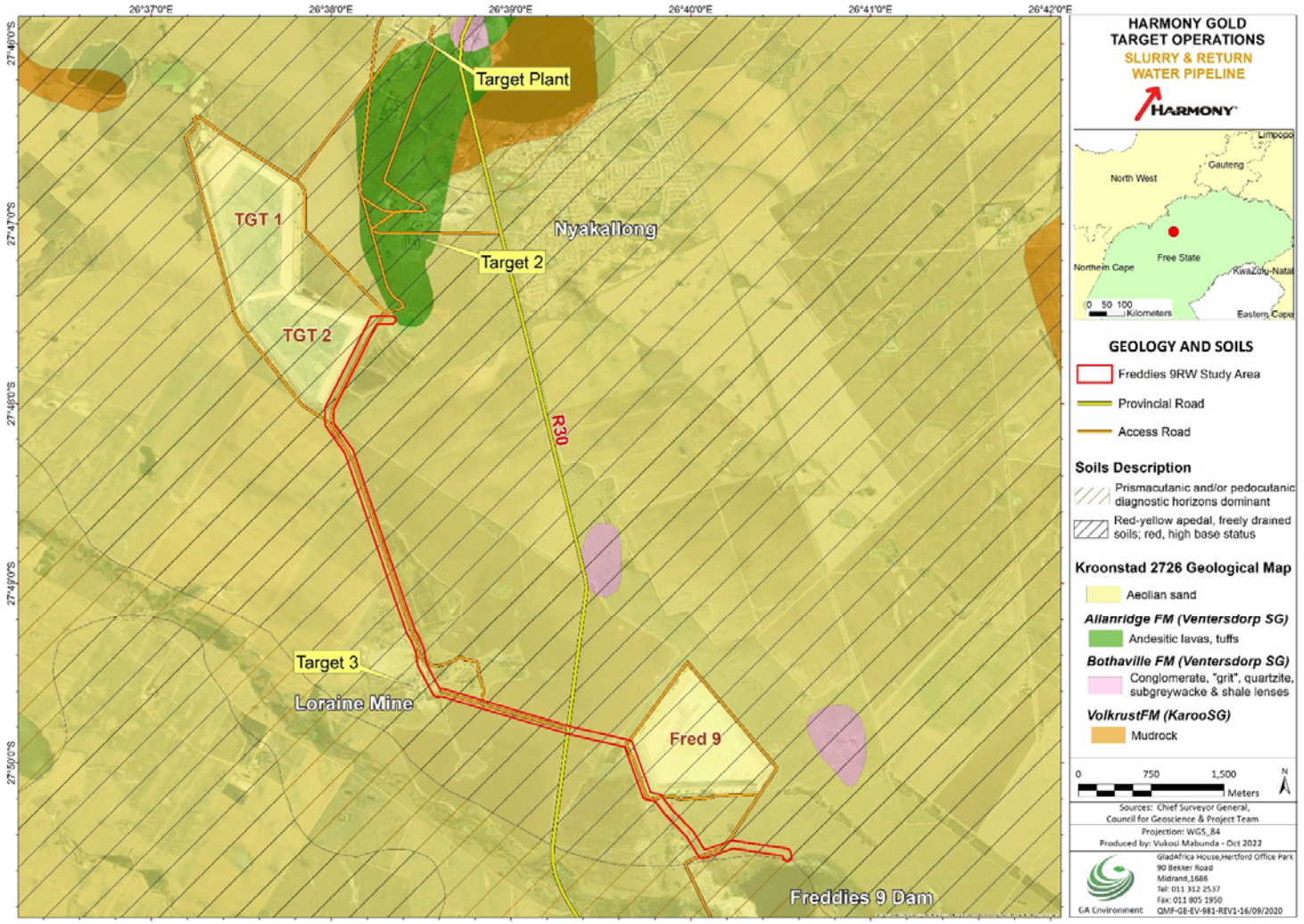

Figure 20: Geology in Relation to the Proposed Study Area

Vegetation Types and Habitat Units

The province Conservation plan (C-Plan) focuses on the mapping of biodiversity priority areas within the province as on **Figure 21**. The C-Plan was consulted in order to determine the location of areas of increased ecological or conservation importance and sensitivity within the vicinity of the study area. This was undertaken by an investigation of biodiversity priority areas which include Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs). The project footprint crosses CBAs and ESAs at the midpoint of the pipeline. However, following site inspections, this section has been modified by the development of the mine gravel road.

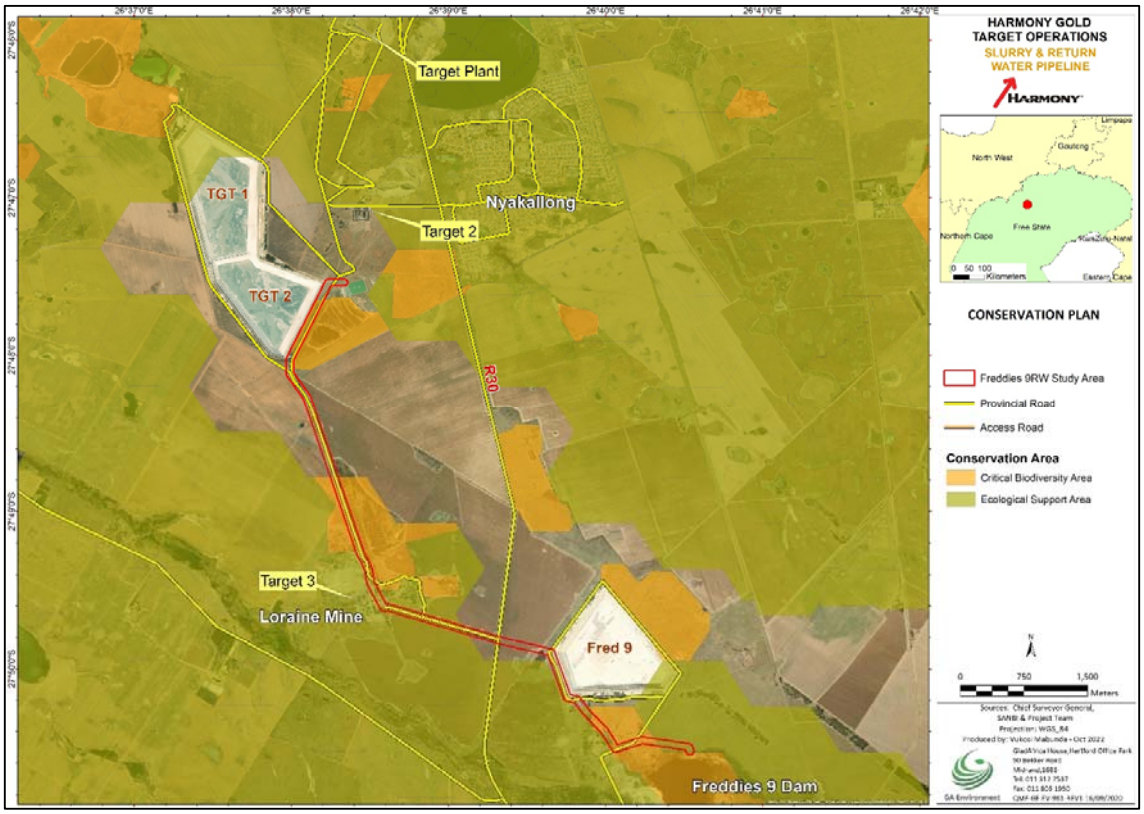

Figure 21: C-Plan of the Study Area

Modified sandy grassland and vegetation associated with the identified seep wetlands are located in small pockets within the pipeline footprint.

A Terrestrial Biodiversity Assessment was undertaken by The Biodiversity Company is attached as **Appendix G. I**nformation presented in this Section is also taken from the biodiversity report. The project area is situated within the Grassland Biome. Grasslands characteristically contain herbaceous vegetation of a relatively short and simple structure that is dominated by graminoids, usually of the family *Poaceae*. The Grassland Biome is comprised of 4 parent bioregions and a total of 72 different vegetation types. The Vaal-Vet Sandy Grassland of the Dry Highveld Grassland Bioregion is characterised by a plains-dominated landscape with some scattered, slightly irregular undulating plains and hills. Mainly low-tussock grasslands are present with an abundant karroid element, where the dominance of *Themeda triandra* is an important feature. (Mucina & Rutherford, 2006). The vegetation map that has been compiled for the project is attached as **Figure 22.**

According to the DFFE Screening Tool report and the NEMBA National list of threatened ecosystems this vegetation type is classified as ‘Endangered’, with the national target for conservation protection being 24%. It is for this reason that Activity 30 of Listing Notice 1 has been included in this application.

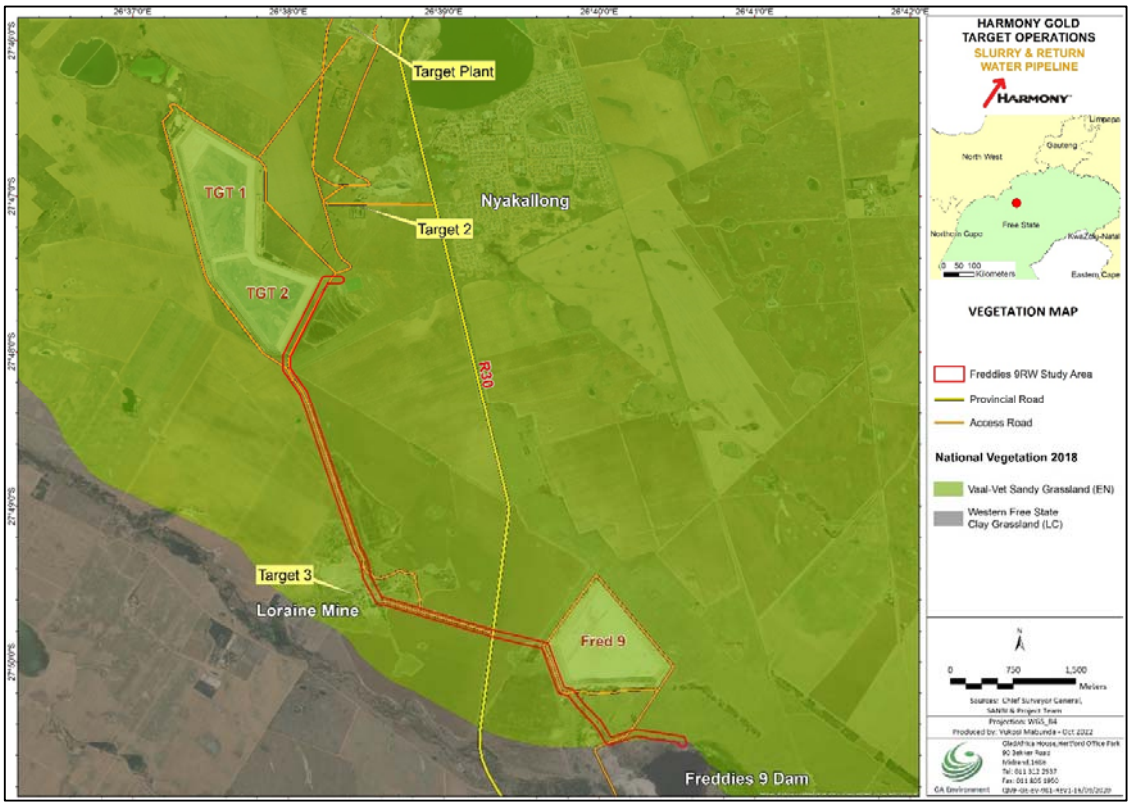

Figure 22: Vegetation in relation to the Study Area (TBC, 2022)

Three habitat units are delineated for the project area: Transformed, Modified Sandy Grassland, (**Figure 23**) and Seep Wetland. The Transformed habitat unit includes all areas that maintain very little to no functional vegetation, such as portions of cultivated land and areas utilised for roads and mining activity. Modified Sandy Grassland was found to occur in largely separated sections along the pipeline routes and is characterised by overgrazed and disturbed fields dominated by pioneer species. These portions do however maintain a level of ecosystem functionality, particularly towards the south of the pipeline routes around Freddies Dam, and they will be supportive of regular fauna activity. The seep wetland unit includes the three artificial wetland systems which intercept with the specified pipeline routes, as delineated and defined by the project freshwater assessment report (TBC, 2022). Although these systems were listed as '*Seriously Modified'* by the wetland report, they maintain an important level of functionality which supports the local fauna species and encourages regular foraging in the area.

The terrestrial biodiversity theme sensitivity as indicated in the screening report (compiled by the National Web based Environmental Screening Tool) was derived to be 'Very High'. The completion of the terrestrial biodiversity desktop and field studies disputes the 'Very High' sensitivity presented by the screening tool report, as relevant to the proposed footprint areas. As discussed above, the proposed footprint area is largely degraded and as such it is assigned an overall sensitivity rating of 'Very Low' to 'Low'. The screening report classified the animal species theme sensitivity as being of a 'High' sensitivity, and the plant species theme as 'Low'. Following the field survey findings, both the animal and plant species themes should be classified as 'Low' sensitivity. This is due to the fact that the frequent occurrence of sensitive SCC is considered unlikely within the local habitats as they maintain only a low level of functionality.

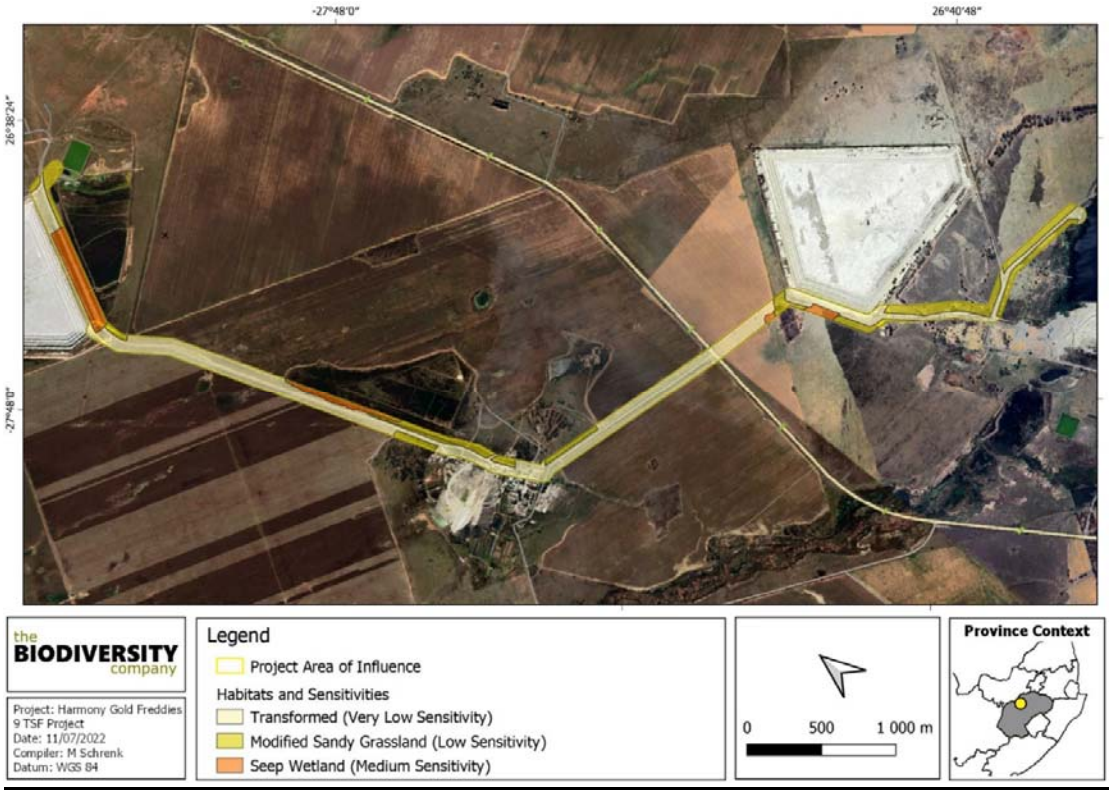

Figure 23: Habitat Units within the Study Area (TBC, 2022)

It must be noted that no portion of the pipeline routes represents intact Vaal-Vet Sandy Grassland vegetation, and the areas listed as Irreplaceable CBAs by the provincial conservation plan exist in a modified state due to the heavy grazing of the areas, the invasion of alien species, and the additional related effects of nearby agricultural and mining activity. No SCC flora or fauna were recorded during the field survey; however, it is noted that certain SCC fauna may move through the area infrequently due to the abundance of wetland systems in the region. Summary of habitat types delineated within field assessment area of the project area is provided in **Table 9**.

Table 9: Summary of habitat types delineated within field assessment area (TBC, 2022)

Habitat	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance
Transformed	Medium	Low	Low	High	Very Low
Modified Sandy Grassland	Medium	Medium	Medium	High	Low
Seep Wetland (Artificial)	Medium	Medium	Medium	Medium	Medium

Important plant taxa are those species that have a high abundance, a frequent occurrence, or are prominent in the landscape within a particular vegetation type (Mucina & Rutherford, 2006). The following species are considered important in the Vaal-Vet Sandy Grassland vegetation type (d = dominant):

Graminoids: *Anthephora pubescens (d), Aristida congesta (d), Chloris virgata (d), Cymbopogon caesius (d), Cynodon dactylon (d), Digitaria argyrograpta (d), Elionurus muticus (d), Eragrostis chloromelas (d), E. lehmanniana (d), E. plana (d), E. trichophora (d), Heteropogon contortus (d), Panicum gilvum (d), Setaria sphacelata (d), Themeda triandra (d), Tragus berteronianus (d), Brachiaria serrata, Cymbopogon pospischilii, Digitaria eriantha, Eragrostis curvula, E. obtusa, E. superba, Panicum coloratum, Pogonarthria squarrosa, Trichoneura grandiglumis, Triraphis andropogonoides.*

Herbs: *Stachys spathulata (d), Barleria macrostegia, Berkheya onopordifolia var. onopordifolia, Chamaesyce inaequilatera, Geigeria aspera var. aspera, Helichrysum caespititium, Hermannia depressa, Hibiscus pusillus, Monsonia burkeana, Rhynchosia adenodes, Selago densiflora, Vernonia oligocephala.*

Geophytic Herbs: *Bulbine narcissifolia, Ledebouria marginata.*

Succulent Herb: *Tripteris aghillana var. integrifolia.*

Low Shrubs: *Felicia muricata (d), Pentzia globosa (d), Anthospermum rigidum subsp. pumilum, Helichrysum dregeanum, H. paronychioides, Ziziphus zeyheriana.*

Endemic Taxon: Herb: *Lessertia phillipsiana.*

Based on the Plants of Southern Africa (BODATSA-POSA, 2019) database, over 620 plant species have the potential to occur within the pipeline routes and its surroundings. Of these species, none are listed as being SCC. An example of some of the indigenous species identified during the site investigation is in **Figures 24 and 25.**

Figure 24: Photograph of the indigenous Asparagus laricinus (TBC, 2022)

Figure 25: Photograph of the invasive Eucalyptus camaldulensis (TBC, 2022)

According to the Terrestrial Ecologist, avifauna and mammal activity was moderate during the survey, however no herpetofauna species were recorded. Some of the avifauna observations include *Anas erythrorhyncha* (Red-billed Teal), *Tadorna cana* (South African Shelduck), and *Anas capensis* (Cape Teal) all within or flying over the nearby watercourses, and *Afrotis afraoides* (Northern Black Korhaan), *Myrmecocichla formicivora* (Ant-eating Chat) in **Figure 26** and *Elanus caeruleus* (Black-winged Kite) occurring over the open grassland areas.

Figure 26: Photograph of Myrmecocichla formicivora (Ant-eating Chat) (TBC, 2022)

Mammal observations include both *Cynictis penicillata* (Yellow Mongoose) and *Herpestes sanguineus* (Slender Mongoose), as well as *Lepus capensis* (Cape Hare) and *Xerus inauris* (South African Ground Squirrel) as on Figure **27.**

Figure 27: Photograph of Xerus inauris (South African Ground Squirrel) (TBC, 2022)

No SCC species were observed during the field survey.

Hydrological

A Freshwater and Wetland/Riparian delineation and Functional Assessment was undertaken for the study area and the information presented was also taken from this report. Existing surface water resources are presented in **Figure 28.** A copy of the report is attached to **Appendix G**.

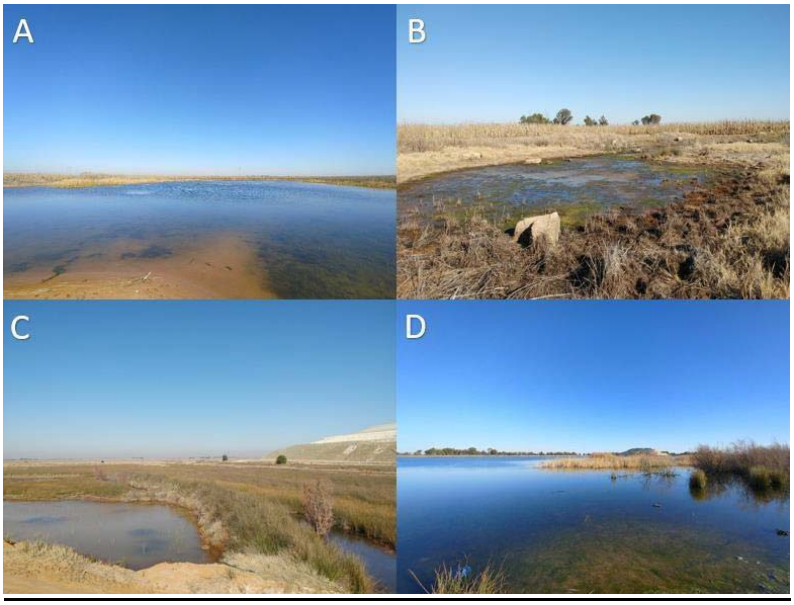

Figure 28: Photographs of water resources identified for the assessment A & B) Depressions, C) artificial seep, D) Freddies Dam (TBC, 2022)

The identified isolated seepage wetlands delineated for the project **(Figure 29)** have been formed through artificial means and have only been delineated for this assessment. No functional assessment has been completed for these systems. These have been identified as an artificial isolated hillslope seepage system. Some of the systems are located adjacent to waste impoundments.

A 200-meter corridor was assigned to the project, this was implemented for a finer-scale assessment. Only portions of two depressions, and a portion of Freddies Dam are located within this corridor. These two depressions were the focus for the functional assessment.

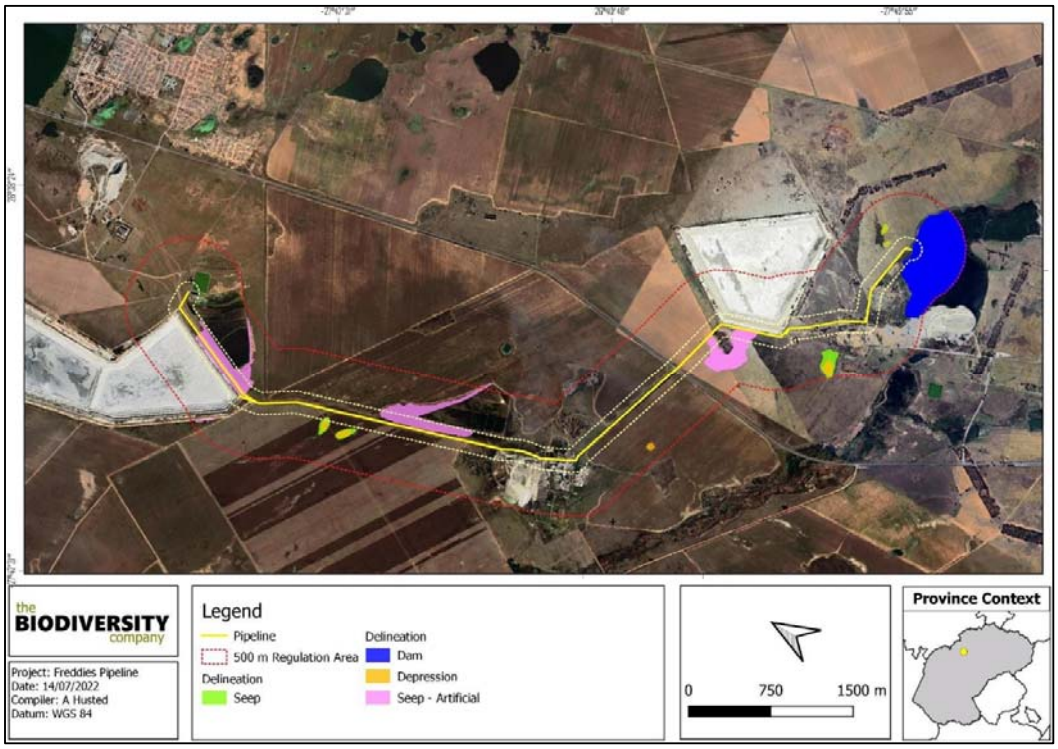

Figure 29: Delineation within the 500 m regulated area (TBC, 2022)

These trenches are purposed to intercept (for diversion) any infiltrating water. Other artificial seeps are located next to current and historic evaporation ponds or pollution control facilities. Water pumped into these facilities is only held in place by means of artificial barriers made of soil and rock, allowing for all water pumped into these facilities to seep through the walls of the impoundments. Seepage systems associated with natural depressions (i.e., pans) have been delineated, and jointly considered with the depressions for the functional assessment. Freddies Dam was delineated for the assessment. According to Ollis et al (2013) a dam is classified as 'an artificial body of water formed by the unnatural accumulation of water behind an artificial barrier that has been constructed across a river channel or an unchannelled valley-bottom wetland'. Freddies Dam is a process water dam and not a clean water dam.

Agricultural Potential

Agricultural Potential Areas are based on four main pillars which are Agricultural Hubs, Important Agricultural Sites, Existing Agriculture and Remaining high Potential Agricultural Land. According to the Agricultural Potential Atlas IV and as presented in **Figure 30**, the proposed site falls within areas of soils highly suitable to arable agriculture under good climatic conditions.

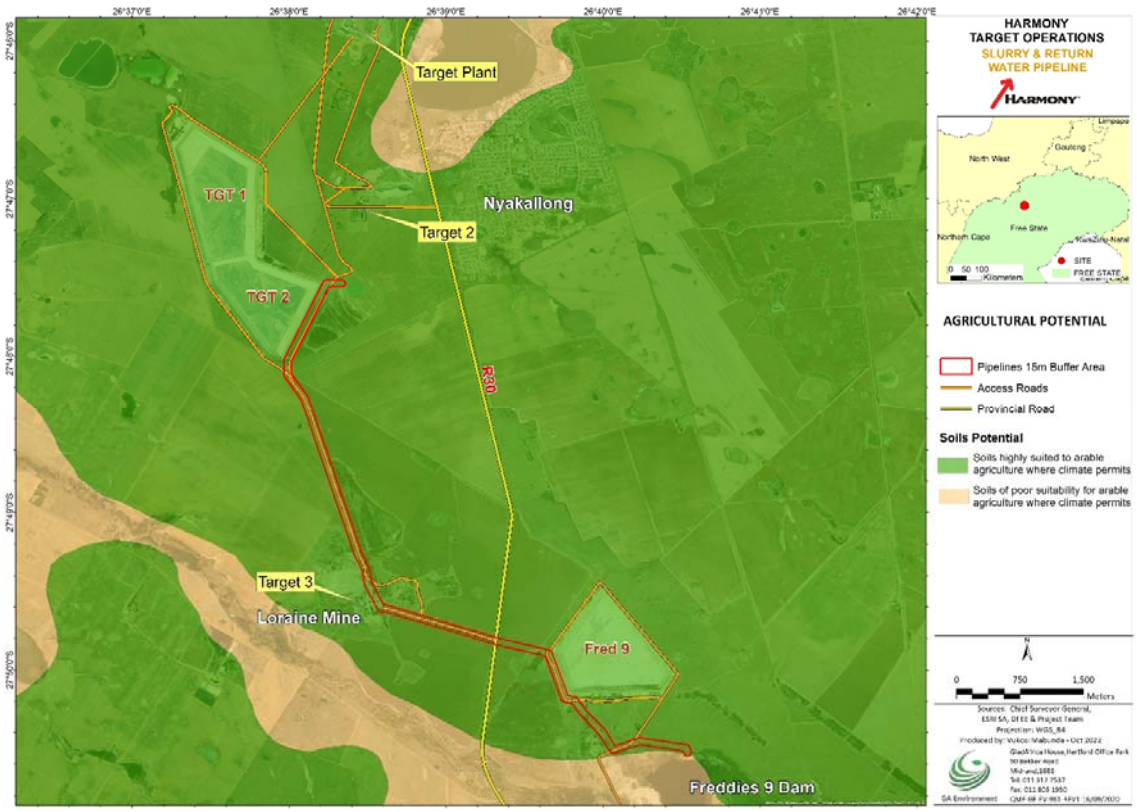

Figure 30: Agricultural Potential Map

Heritage and Palaeontological Features

A Heritage Impact Assessment was undertaken by PGS Heritage. The HIA is included **as Appendix G** and the input from this report was considered during the compilation of this section. A desktop study was conducted of the published literature regarding the history and archaeology of the general study area. Both historical and recent topographical maps, as well as satellite information (Google Earth), were analysed for indications of possible historical or archaeological structures. A site visit was conducted where tracklogs and points of significance were recorded with a handheld GPS and a photographic record of the visit was captured. General site conditions and features on site were recorded by means of photos, GPS coordinate locations, and descriptions. Site significance classification standards prescribed by SAHRA and approved by the Association of Southern African Professional Archaeologists (ASAPA) were used to determine heritage features of significance. The study revealed that no sites, features, or objects of cultural significance were identified. The HIA conducted for this project will be submitted to the SAHRA for their comment and input.
A desktop Palaeontological Assessment was undertaken. The study concluded that the potential impact of the development on fossil heritage is **LOW** and therefore a field survey is not necessary for this development (according to SAHRA protocol).

Socio-Economic

The proposed study area is situated within ward 36 of Matjhabeng Local Municipality. According to the 2011 census, the ward covers an area of 392km^2 with a population of 9 605. Of these 1% were coloured, 69% black and 29% white, 1% Indian/Asian as depicted in **Figure 31**. Of the total population 69% were between the ages of 18 and 64 with 51% of the population consisting of males (Census, 2011).

Figure 31: Ward 36 Demographics (https://wazimap.co.za/profiles/ward-36)

a) Employment

In 2011, 50.5% of the community members within Ward 36 were employed with 51% of these employed in the formal sector. The average annual household income is R 57 300 which is approximately double the average annual income in Lejweleputswa and the entire Free State province as presented in **Figure 32**.

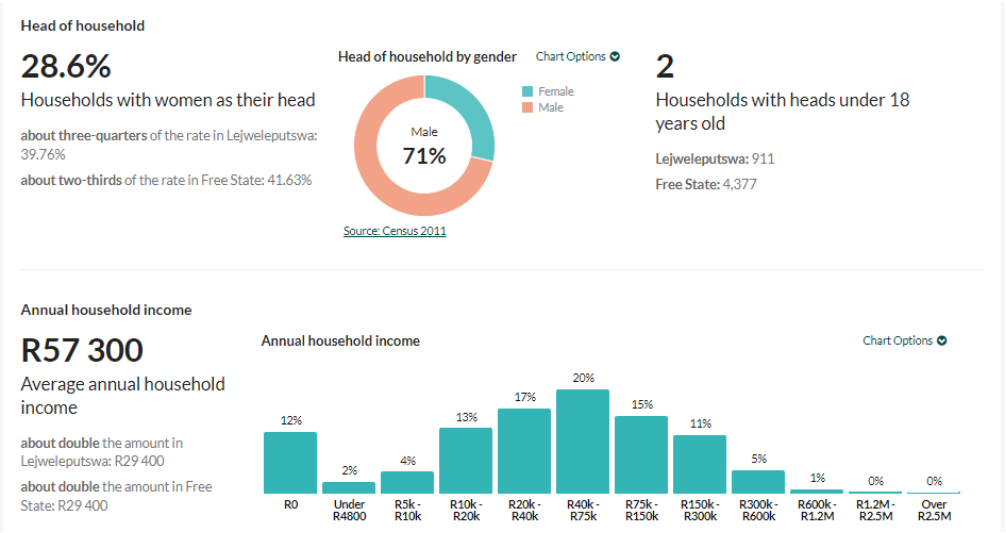

Figure 32: Ward 36 Employment and Income Statistics (https://wazimap.co.za/profiles/ward-36)

b) Service Delivery

Approximately 90.2% of households obtain water from a regional or local service provider, 8% from a borehole, and the remainder from other sources (**Figure 33**).

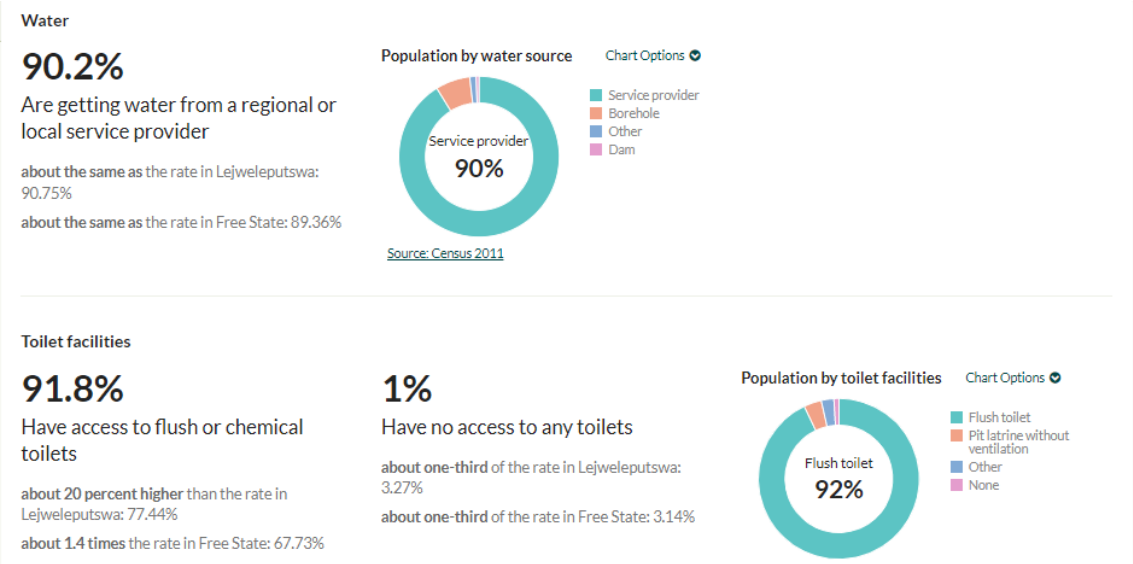

Figure 33: Ward 36 Housing and Service Delivery (https://wazimap.co.za/profiles/ward-36)

Approximately 91% have access to flush or chemical toilets whilst 1% of the population have no access to toilets.

(b) Description of the current land uses.

The study area, which is 4.9 hectares (ha) in extent compromises of open vacant land with the surrounding land use consists predominantly of agricultural and mining areas, in addition to the associated infrastructure such as roads and Nyakallong community houses.

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

Refer to the sensitivity map (**Figure 34**) which shows sensitive environmental features within the study area.

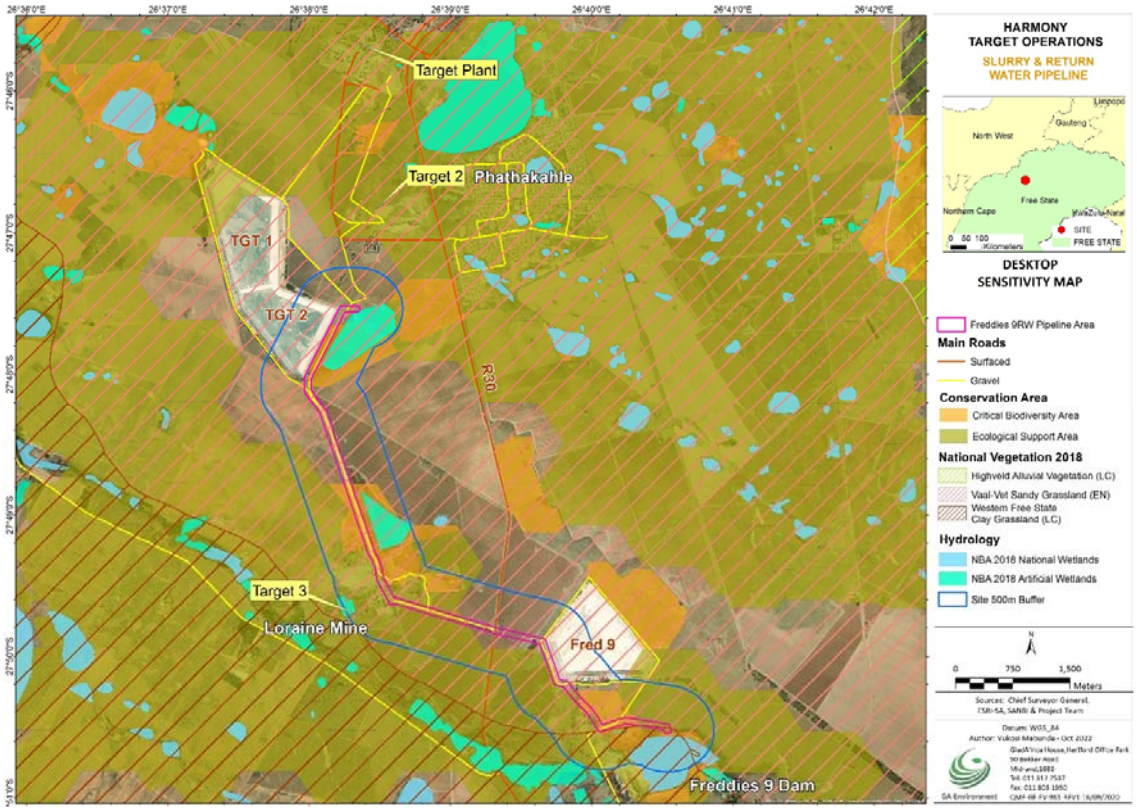

Figure 34: Environmental Sensitivity Map of the Site

The environmental features have already been discussed under **Section iv 1a.** The primary environmental features that have been considered in the development of the Environmental sensitivity map for which impacts must be mitigated are:

- Seep wetland and its vegetation
- Modified sandy grassland
- Category 1b species that must be controlled and prevented from spreading
- Topsoil in order to prevent erosion

In terms of Infrastructure, the proposed site for the pipeline is currently vacant and will connect to the existing Freddies 9 TSF as depicted in **Figure 35**.

Figure 35: Freddies 9 TSF with Freddies Return water dam in the background.

(d) Environmental and current land use map.

(Show all environmental, and current land use features)

Figure 36 provided a land cover map for the proposed pipeline study area.

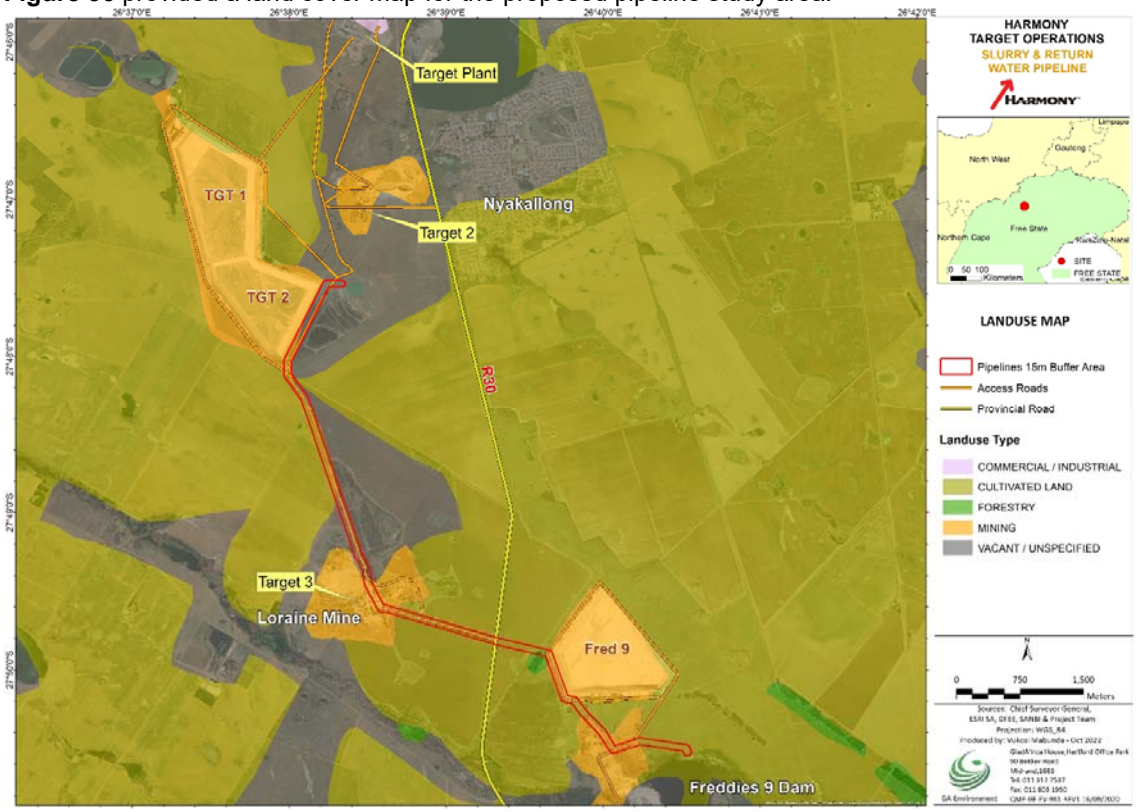

Figure 36: : Land Use Map

The map shows that the proposed study area and surroundings does not fall within an urban/built up area. The dominant land cover types within the project area is cultivated land.

(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).

1. Impact 1: Change in Topography

Description of the Impact

There will be minimal impact on topography during the construction phase. It is anticipated that the proposed activities will cover an area of approximately 4.9 hectares**.** Error! Reference source not found.**10** presents the impact ratings for change in topography.

Table 10: Impact rating for change in topography

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negative	1 Site	1 Short term	1 Low	3 Negligible	2 Probable	Y	Low	4-6 Low	4-6 Low
Operational	Negative	1 Site	2 Medium	2 Medium	4-5 Low	4 Definite	Y	Low	4-6 Low	1-3 No Significance

Cumulative Impact

The proposed activities will not alter the topography of the study area and contribute to the cumulative impact. The establishment of additional mining projects in the area could impact on current topography than the proposed project.

Mitigation measures

- The footprint of the proposed mining activities shall be demarcated in order to restrict the development footprint.

2. Impact 2: Loss of floral and faunal habitat

Description of Impact

Loss of floral and faunal habitat will inevitably take place during the construction phases of the project.

As indicated in the Terrestrial Biodiversity Assessment Report undertaken by the Biodiversity Company (2022), the project area is situated within the Grassland Biome. In terms of vegetation structural composition, grasslands are characteristically dominated by grasses of the *Poaceae* Family (Mucina & Rutherford, 2006). The Grassland Biome in South Africa occurs mainly on the Highveld, the inland areas of the eastern seaboard, the mountainous areas of KwaZulu-Natal and the central parts of the Eastern Cape. The topography is mainly flat to rolling, but also includes mountainous regions and the Escarpment (Mucina & Rutherford, 2006).

The implementation of an Alien Invasive Plant management plan (**Appendix H)** is very important, especially because of the invasive species identified on site which, if left unchecked, will continue to grow and spread prolifically leading to further and more significant deterioration to the health of the natural environment within and nearby to the footprint area. The plan must especially pertain to any recently cleared and changed areas.

Potential activities that could contribute to the loss of floral and faunal habitat are as follows:

- Initial clearing of vegetation during site establishment and preparing surface areas for clearing and stockpiling.
- Development of infrastructure and temporary infrastructure such as access roads, Contractors' laydown areas and ancillary infrastructure such as generator and fuel storage areas, temporary toilets, spoil material stockpiles.
- Development of infrastructure and temporary infrastructure within areas of increased ecological sensitivity.
- Disturbance of soils leading to increased erosion, particularly on steep slopes and erosion-prone soils.

- Compaction of exposed soils due to vehicle movement. Littering and dumping of waste material outside of designated areas.
- Disturbance within the project area and surrounds due to increased human activity and operational vehicles.
- Ongoing proliferation of alien and invasive floral species that may outcompete indigenous floral species and degrade faunal habitat.
- Altered community composition of areas within the project footprint as well as adjacent habitats due to altered ecosystem processes.
- Altered runoff patterns leading to erosion and sedimentation.
- Ineffective rehabilitation of exposed and impacted areas and failure to implement progressive backfilling, rehabilitation and revegetation according to an approved rehabilitation plan.

Error! Reference source not found. provides the risk rating for loss of floral and faunal habitat.

Table 11: Impact Ratings for the loss of floral and faunal habitat

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negative	1 Site	3 Long term	3 High	6-8 Moderate	4 Definite	Y	High	8-10 Medium	4-6 Low
Operational	Negative	1 Site	3 Long term	3 High	6-8 Moderate	4 Definite	Y	High	8-10 Medium	4-6 Low

Cumulative Impact

The project area is located within a region where some degree of land transformation is noticeable from available aerial imagery, and the region is known to be impacted by mining activities.

Mitigation Measures

- The positioning of project infrastructure in relation to areas of increased ecological importance and sensitivity should be considered during the pre-construction and planning phases of the project, to determine where and if habitat loss can be avoided within certain areas.
- No areas should be cleared of natural vegetation if not required for construction and operational purposes, and development footprint areas should be kept as small and compact as possible. The loss of indigenous vegetation should be limited where possible.
- No natural areas on adjacent properties may be disturbed in any way and access roads towards the project area should follow existing roads and tracks and utilise existing access points to prevent clearing of additional areas.
- Ecological connectivity within the project area and between the project area and adjacent properties should be considered and maintained where and if possible, to ensure faunal movement patterns are not completely restricted.
- Where areas of increased ecological sensitivity can be avoided, these areas should be indicated on site and be off limits to construction vehicles and workers.
- Vehicle access beyond the designated project footprint areas should be prohibited.
- Construction camps, contractors' laydown areas and other temporary infrastructure are to be placed within areas that have already been modified where possible.
- No littering or dumping of waste and construction material within natural areas beyond the project footprint areas may be allowed.
- Edge effects from construction and operational activities, such as erosion and alien floral species proliferation and the spread of these within disturbed areas, should be managed throughout all the

development phases through the implementation of erosion control measures where required and the implementation of an alien and invasive species control plan.
- Dust suppression measures must be implemented.
- As far as possible, site restoration/ rehabilitation should take place concurrently/ progressively and as areas become available for rehabilitation.
- It was the specialist recommendation that the rehabilitated surface should be sloped and shaped in such a way to be free draining, to prevent erosion and to a degree which will support vegetation establishment. It is the EAP recommendation that the side slopes are re-vegetated by commercial grass seeds to allow for eventual return to natural vegetation.
- Topsoil or suitable growing medium should be applied to the surface, where feasible, prior to revegetation to support vegetation growth, and the necessary soil amelioration should be undertaken. Soil analysis may be required to determine the necessary requirements.
- Revegetation should, as a minimum, comprise direct seeding of an indigenous grass seed mixture comprising grass species recorded in the study area.
- Any disturbed and compacted areas outside of the project footprint areas must be ripped, reprofiled and revegetated with indigenous plant species naturally growing within the area.

3. Impact 3: Loss of floral species diversity and floral SCC

Description of Impacts

During the construction phase, Loss of floral species diversity may take place during the construction and operational phases of the project as a result of clearing of vegetation for site establishment. During the construction phase of the project, the loss of floral species diversity and faunal SCC can result from the following activities:

- Ongoing disturbance within the project area and surrounds due to increased human activity and movement of operational vehicles.
- Disturbance beyond the project footprint areas, leading to loss of habitat with increased floral diversity and species with limited representation in the region.
- Illegal harvesting of floral species with a limited representation within the project area or region.
- Accidental fires due to increased human activity.
- Dust generation from unpaved roads impacting on floral species diversity.
- Ongoing proliferation of alien and invasive floral species may outcompete certain floral species.
- Ongoing clearance of vegetation as excavation progresses and ongoing disturbance within the project area and surrounds due to increased human activity and movement of operational vehicles.
- Illegal harvesting of floral SCC and floral species with a limited representation within the project area.
- Movement of operational vehicles through areas of increased ecological sensitivity known to provide habitat for floral SCC beyond the project footprint area.

The impact ratings for the loss of floral species diversity and floral SCC are provided in **Table 12.**

Table 12: Impact ratings for the loss of floral species diversity and floral SCC

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negative	2 Local	4 Permanent	3 High	9-10 High	3 Highly probable	Y	High	8-10 Medium	4-6 Low
Operational	Negative	2 Local	4 Permanent	3 High	9-10 High	3 Highly probable	Y	High	4-6 Low	1-3 No Significance

Cumulative Impacts

Development within the project area will lead to the loss of ecological resources and is likely to diminish local and regional biodiversity and available habitat, associated with the region over time.

Mitigation Measures

- All construction and operational personnel must be educated in environmental awareness and be trained to identify floral SCC known to occur in the project area, as well as floral SCC with a high probability of occurring in the project area.
- The loss of floral SCC must be actively avoided and floral SCC and habitat for these species should ideally be conserved *in situ*. If this is not possible (due to the location of the resource to be extracted, the size or habit of the species), the following are applicable:
- No harvesting of firewood or collection of floral species from natural areas surrounding the project footprint should be allowed by construction workers.
- The conservation of faunal habitat is directly linked to the reduction in faunal related impacts such as direct loss and disturbance.
- Site clearance of the approved footprint must utilise a phased approach to allow faunal species to disperse from the area.
- All vehicles (construction or light motor vehicles) accessing the project must adhere to a 30km/hr speed limit and vigilant driving techniques.
- No wild animals may under any circumstance be handled or removed by construction workers.
- Hunting/ killing/ collection of fauna is prohibited.
- Any snares or traps found on or adjacent to the project area must be removed and disposed of.
- Biodiversity education and awareness programmes must be implemented. This programme should form part of the staff induction in which topics such as vigilant driving techniques and the necessary procedures for working in close proximity to sensitive habitats.

4. Impact 4: Loss of faunal species diversity, SCC and disturbance to Faunal Communities

Description of Impacts

Disturbance to faunal communities will occur during both the construction and operational phases of the project. Elevated levels of disturbance will likely result in local faunal species moving away from the area and a subsequent localised decline in biodiversity (as certain species are more sensitive to disturbances). This is of particular concern as the project area falls within a conservancy. Fauna occurring in adjacent habitats, outside of the direct impact zone, may also be negatively affected such as altering/ impeding movement corridors. Loss of faunal species will also likely take place during the construction and operational phases: The following project activities may lead to disturbance of faunal communities:

Construction Phase

- Initial clearing/harvesting of vegetation during site establishment and preparing surface areas for excavation activities and stockpiling, particularly within intact faunal habitats
- Construction of infrastructure and temporary infrastructure such as access roads and contractors' laydown areas through or within areas of increased ecological sensitivity.
- Increased human activity within the project area and associated construction activities.
- Potential use of artificial lighting.
- Construction of infrastructure and temporary infrastructure such as access roads and contractors' laydown areas through or within areas of increased ecological sensitivity.

Operational Phase

- Ongoing clearance of vegetation and ongoing disturbance within the project area and surrounds due to increased human activity and movement of operational vehicles, powered machinery, noise-pollution, vibrations, excessive dust, and artificial lighting associated with operational activities.
- Use of heavy machinery and construction activities
- Movement of operational vehicles through areas of increased ecological sensitivity known to provide habitat for faunal SCC.

- Likely alteration of faunal communities to those with a higher tolerance of anthropogenically modified landscapes. This will likely result in the decline in the likelihood of SCC being present.
- Uncontrolled fires.
- Potential collection/poaching of fauna.
- Disturbance beyond the project footprint areas, leading to loss of habitat quality.

Table 13 provides the impact ratings for loss of faunal species diversity, SCC and disturbance to faunal Communities

Table 13: Impact Ratings for the loss of faunal species diversity, SCC and disturbance to faunal Communities

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negative	2 Local	4 Permanent	3 High	9-10 High	3 Highly probable	Y	High	8-10 Medium	4-6 Low
Operational	Negative	2 Local	4 Permanent	3 High	9-10 High	3 Highly probable	Y	High	8-10 Medium	4-6 Low

Cumulative Impacts

Development within the project area will lead to the loss of ecological resources and is likely to diminish local and regional biodiversity and available habitat, associated with the region over time.

Mitigation Measures

- The conservation of faunal habitat is directly linked to the reduction in faunal related impacts such as direct loss and disturbance.
- All vehicles (construction or light motor vehicles) accessing the project must adhere to a 30km/hr speed limit and vigilant driving techniques.
- No wild animals may under any circumstance be handled or removed by construction workers.
- Hunting/ killing/ collection of fauna is prohibited.
- Any snares or traps found on or adjacent to the project area must be removed and disposed of.
- Biodiversity education and awareness programmes must be implemented. This programme should form part of the staff induction in which topics such as vigilant driving techniques and the necessary procedures for working in close proximity to sensitive habitats.
- Disturbance to sensitive habitats must be avoided and the project footprint must be clearly demarcated.
- No wild animals may under any circumstance be handled or be interfered with by construction workers or any personnel.
- Construction activities should be timed to coincide with the period when Red List bird species that could potentially occur on site are unlikely to be breeding, if possible.
- In order to reduce noise pollution, proper maintenance of equipment is required, and the implementation of low noise techniques is recommended.
- No dumping of waste may take place outside of the project area and any accidental spills of hazardous waste must be immediately cleaned through an appropriate and approved plan.

5. Impact 5: Soil compaction and contamination

Description of Impacts

During the construction and operational phased, heavy equipment traffic could potentially result in soil compaction. The loss of topsoil could potentially result in a decrease in the rehabilitation and future land

use potential of land that has been disturbed. Pollution of soils as a result of *ad-hoc* spills. Contamination sources are generally unpredictable and often occur as incidental spills or leaks from operational activities **Table 14** presents the impact ratings for soil compaction and contamination

Table 14: Potential Impacts of soil compaction and contamination

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low

Cumulative Impacts

Other activities that may contribute to the cumulative impact on the soils include overgrazing and associated poor land-management practices. With the expected soil degradation occurring, a decline in the overall soil quality and health, may hinder the soil suitability for the end land use after project closure.

Mitigation measures

- A site-specific stormwater management plan must be compiled and implemented by the Contractor to take the increased surface water run-off rates and volumes and their erosion potential into consideration.
- Drip trays shall be provided in construction areas for stationary plant and for “parked” plant; Drip trays, sumps and bunds must be emptied regularly, especially before a known rain event and after a rain event, and the contents disposed of at a licensed disposal facility.
- All vehicles and equipment shall be kept in good working order and serviced regularly; Leaking equipment shall be repaired immediately or removed from the Site.
- Ensuring that the development is kept within the Construction footprint.

6. Impact 6: Impact on surface water resources

Description of Impacts

The identified isolated seepage wetlands delineated for the project have been formed through artificial means and have only been delineated for this assessment. No functional assessment has been completed for these systems. These have been identified as an artificial isolated hillslope seepage system. Some of the systems are located adjacent to waste impoundments. Water infiltrates impoundments during rainfall events and seeps out in areas without the presence of successful trenches. These trenches are purposed to intercept (for diversion) any infiltrating water. Other artificial seeps are located next to current and historic evaporation ponds or pollution control facilities.

Table 15 provides the impact ratings for surface water resources.

Table 15: Impact Ratings for surface water resources

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negative	1 Site	3 Long term	1 Low	4-5 Low	1 Improbable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	1 Site	3 Long term	1 Low	4-5 Low	1 Improbable	Y	Low	8-10 Medium	4-6 Low

Cumulative Impacts

Expected to be low. Construction activities may result in low cumulative impact to the water courses within the local catchments and beyond by contributing to loss of wetland zonation through changed water flow patterns. Sedimentation of the watercourse will further change hydrological zonation and result in the loss of specialised habitats. Reversing this process is unlikely and should be prevented in the first place.

Mitigation measures

- Effective stormwater management should be a priority during the construction phase. This should be monitored as part of the EMP.

7. Impact 7: Impact on ground water resources

Description of Impacts

During the construction and operational phases, potential contamination of groundwater due to spillages and leaks of hazardous substances, improper stormwater management, and fuel/oil leaks from vehicles during the operation of the pipeline. **Table 16** provides the impact ratings for groundwater resources.

Table 16: Impact ratings for groundwater resources

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	4-6 Low	1-3 No Significance

Cumulative Impacts

Poor land-management practices may contribute to the cumulative impact on ground water resources.

Mitigation measures

- Emergency machinery and equipment maintenance shall be conducted over a drip tray, or a PVC lining to prevent soil and water contamination.
- Effective stormwater management should be a priority during the construction and operational phase.

8. Impact 8: Impacts on Air Quality

Description of Impacts

During the construction phase of the project, the activities that will most likely generate emissions earthworks, removal of topsoil and vegetation clearance, and vehicle movement on haulage routes and public roads. In terms of the construction phase, the main sources of particulate emissions would be from the haulage of material and vehicular movement on unsurfaced dust roads. These emissions will have an impact on air quality on site as well as the surrounding areas. **Table 17** provides the impact ratings for Air Quality.

Table 17: Impact ratings for air quality

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P) Without Mitigation	Significance With Mitigation
Construction	Negati ve	1 Site	3 Long term	2 Medi um	6-8 Moderate	3 Highly probabl e	Y	Low	8-10 Medium	4-6 Low
Operational	Negati ve	1 Site	3 Long term	2 Medi um	6-8 Moderate	3 Highly probabl e	Y	Low	8-10 Medium	4-6 Low

Cumulative Impacts

Additional emissions from other vehicles could contribute to impacts on the ambient air quality of the region.

Mitigation Measures

- Implement dust suppression measures in all areas that will be affected by construction activities and where dust will be generated. Dust suppression must also be undertaken during windy and dry weather conditions.
- The Contractor shall produce method statements for activities with the potential to generate dust emissions.
- Restrict the project footprint to only what is required.
- Stockpiles shall be protected from wind erosion.
- Heavy vehicles and machinery should be serviced regularly to minimise exhaust fume pollution.
- Diesel generators shall be subject to routine maintenance to keep the engines in optimum working order.

9. Impact 9: Noise and Blasting Hazard

Description of Impacts

Activities undertaken during the construction will generate noise but will unlikely affect the adjacent community. **Table 18** provides the impact ratings for noise and blasting hazards.

Table 18: Impact ratings for noise and blasting hazards

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P) Without Mitigation	Significance With Mitigation
Construction	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	1 Site	3 Long term	2 Medium	9-10 High	3 Highly probable	Y	Low	4-6 Low	1-3 No Significance

It should also be noted that noise pollution (disturbance and nuisance) will have different impacts on the different receptors because some are very sensitive to noise while others are not. For example, workers would not expect a noise free working environment and so they will be less sensitive to environmental noise pollution at work. However, neighbouring residents may be sensitive to additional noise and so any change to ambient noise levels because of operation-related noise may have a negative impact on them and their anticipated residential experience. The South African National Standard (SANS) guidelines for noise (SANS 10103, 2008) provides a guideline for estimating community response to an increase in general ambient noise level caused by an intruding noise.

Cumulative impacts

The generation of additional noise could contribute to impacts on the ambient noise level experienced in proximity to the site.

Mitigation Measures

- Noise levels shall be monitored to comply with SANS 10103:2008 and Occupational Health and Safety Act requirements.
- The Contractor shall compile a method statement that describe all measures that will be implemented to control and minimise noise and impacts on biodiversity, people, and livestock.
- The Contractor will be required to develop a grievance protocol to manage and address any noise complaints received. Respond to all noise related grievances received and implement mitigation measures.
- A conservative vehicle maintenance schedule will be developed that seeks to reduce any increase in noise / vibration outputs due to 'wear and tear'.
- The informal use of truck honking systems will be prohibited (especially when in or passing residential areas or schools) and will only be used to prevent vehicle / pedestrian collision.
- The excessive idling of stationary trucks will be prevented.
- Adjacent landowners and businesses must be notified well in advance about blasting activities (if required) and appropriate precautionary measures must be taken.
- All blast related complaints shall be recorded and closed out by the Contractor.

10. Impact 10: Traffic Impacts

Description of Impacts

The R30 road where the pipeline will cross through a culvert will require traffic management during construction. **Table 19** provides the impact ratings for traffic impacts.

Table 19: Impact ratings for traffic impacts

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P) Without Mitigation	Significance With Mitigation
Construction	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	2 Local	3 Long term	3 High	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low

Cumulative Impacts

Future development within the region could result in a cumulative impact on road traffic.

Mitigation Measure

- The approved traffic accommodation must be complied with.
- Implementation of a traffic complaints procedure.
- A traffic management plan shall be compiled and implemented by the Contractor.

11. Impact 11: Visual and Aesthetic Impacts

Description of Impacts

In terms of the aesthetics, the development will impact on the localised sense of place which has been scarred by mining activities and existing pipeline infrastructure. The visual intrusion is expected to be low after mitigation.

Table 20 provides the impact ratings for visual and aesthetic impacts.

Table 20: Impact ratings for Visual and Aesthetic Impacts

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P) Without Mitigation	Significance With Mitigation
Construction	Negative	2 Local	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	2 Local	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low

Cumulative Impacts

Potential cumulative impacts will depend on the number of projects within the region at the same time.

Mitigation Measures

- Develop material stockpiles only in areas designated on the site plan.
- Ongoing clearing of alien invasive vegetation in the disturbed areas associated with the works.

12. Impact 12: Cultural and Heritage Impacts

Description of Impacts

The proposed development will require removal of vegetation during the preparation of the service/maintenance road. During the course of such operations, it is possible that undiscovered cultural heritage material, including fossils could be unearthed.

Table 21 provides the impact ratings for cultural and heritage impacts.

Table 21: Impact Ratings for Cultural and Heritage Impacts

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	2 Probable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	2 Probable	Y	Low	8-10 Medium	4-6 Low

Cumulative Impacts

While the broader area surrounding the site is largely undeveloped, future development within the region could result in a cumulative loss of heritage resources over time.

Mitigation Measures

- The contractors and workers should be notified that archaeological sites might be exposed during the construction activities.
- Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible.
- All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken.
- Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological, or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51. (1).

13. Impact 13: Palaeontological Impacts

Threats to palaeontological resources are earth moving equipment/machinery (for example haul trucks, front end loaders, excavators, graders, dozers) during construction and operation. **Table 22** provides the impact ratings for cultural and heritage impacts.

Table 22: Impact ratings for Palaeontological Impact

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	2 Probable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	2 Probable	Y	Low	8-10 Medium	4-6 Low

Cumulative Impacts

While the broader area surrounding the site is largely undeveloped, future development within the region could result in a cumulative loss of fossil resources over time.

Mitigation Measures

- If any palaeontological material is exposed during digging, excavating, drilling, SAHRA must be notified. All construction activities must be stopped, and a palaeontologist should be called in to determine proper mitigation measures,
- Should Fossils be unearthed the Contractor shall notify the Free State Provincial Heritage Resource Agency and specialists to further investigate.
- The area must be fenced-off with a 30 m barrier and the construction workers must be informed that this is a ''no-go'' area.

14. Impact 14: Socio Economic Impacts

Description of the Impacts

The construction phase will have the following negative impacts:
- Population influx due to job seekers to the area which could pose a number of risks to the local community.

The operational phase of the development will have the following impacts:
- Proposed development would maintain a number of local employment and business opportunities.
- Opportunity for skills development and transfer.

Table 23 provides the impact ratings for Socio-Economic Impacts

Table 23: Impact Ratings for Socio-Economic Impacts

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negative	2 Local	2 Medium	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low
Operational	Positive	2 Local	2 Medium	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium Positive	1-3 No Significance

Cumulative Impacts

Construction Phase: Depending on the number of other projects in the area, and the number of labourers may exacerbate the risks.

Operational Phase: Potential cumulative impacts linked to employment and business opportunities would depend on other construction projects being implemented in the same timeframe.

Mitigation Measures

- Employment and procurement opportunities provided to identified communities.
- The Contractor must ensure that the recruitment process is conducted through the community structures established for the contract.

15. Impact 15: Increase in Waste

Description of Impacts

During the construction phase, waste will be generated through the clearance of vegetation, and domestic waste will be generated. Littering and improper waste storage may attract vermin resulting in a negative visual appeal of the area. The potential of incidental spillages that may occur on site will result in contaminated soil which is treated as hazardous waste e.g., chemicals, oils, soil contaminated by spillages, diesel rags. **Table 24** provides the impact ratings for waste.

Table 24: Impact Ratings for the Waste

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low

Cumulative Impacts

Potential cumulative impacts will depend on the number of projects within the region at the same time**.**

Mitigation Measures

- A waste management plan shall be compiled and implemented by the Contractor. Waste hierarchy principals-reduce, reuse, recycle shall be implemented. Recyclable waste must be kept separate from general waste and taken to a waste recovery / recycling facility.
- Adequate storage facilities for general and hazardous waste.
- Waste receptables with lids (i.e. weather and vermin proof) for management of waste on site.
- Hazardous waste shall be stored in a bund wall. Disposal of all hazardous waste at a hazardous waste landfill.
- General waste shall be disposed at a landfill at least weekly, or more frequently if required.

16. Impact 16: Safety

Description of Impacts

The proposed development could present employee health and safety risks if not monitored correctly. **Table 25** provides the impact ratings for Safety.

Table 25: Impact Ratings for Safety

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P) Without Mitigation	Significance With Mitigation
Construction	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low

Cumulative Impacts

Potential safety impacts related to safety will depend on other construction projects in the same area with the same timeframe.

Mitigation Measures

- Suitable Personal Protective Equipment (PPE) must be worn at all times by all employees on site during the construction and maintenance phases of the project.
- With the exception of the project team members, no persons should be allowed to enter the construction site area.
- The site and crew are to be managed in strict accordance with the MHSA.
- The mine Health and Safety Department must be involved to ensure employee safety at all times.
- The Contractor must ensure that lists of all emergency telephone numbers / contact persons are kept up to date and that all numbers and names are posted at relevant locations throughout the construction site.
- The nearest emergency service provider must be identified during all phases of the project as well as its capacity and the magnitude of accidents it will be able to handle. The contact details of this emergency centre, including police and ambulance services must be available at prominent locations around the construction site.

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

(Describe how the significance, probability and duration of the aforesaid identified impacts that were identified through the consultation process was determined in order to decide the extent to which the initial site layout needs revision).

In accordance with the NEMA EIA regulations (Government Notice R.982, promulgated in terms of Section 24 of the National Environmental Management Act, 1998 (Act 107 of 1998)), as amended the Environmental Assessment Practitioner (EAP) is required to assess the significance of potential impacts in terms of the following criteria as outlined in Appendix 1:

- cumulative impacts;
- nature, significance and consequences of the impact and risk;
- extent and duration of the impact and risk;
- probability of the impact and risk occurring;
- the degree to which the impact and risk can be reversed;
- the degree to which the impact and risk may cause irreplaceable loss of resources; and
- the degree to which the impact and risk can be avoided, managed, or mitigated.

Activities within the framework of the proposed development and their respective construction and operational phases, give rise to certain impacts. For the purpose of assessing these impacts, the project has been divided into three phases from which impacting activities can be identified, namely:

Construction phase:
This phase refers to all the pre-construction and construction related activities on site, until the contractor leaves the site.

Operational phase:
This includes all post construction activities, including the operation and maintenance of the proposed development.

The assessment of the impacts will be conducted according to a synthesis of criteria required by the integrated environmental management procedure. The methodology that will be used comprises of the following four steps:

- Step 1: Identification of positive and negative impacts of the project;
- Step 2: Identification of the significance rating of the impact before mitigation;
- Step 3: Identification of the mitigation measure and the mitigation efficiency; and
- Step 4; Identification of the significance rating of the impact after mitigation;

Activities that will be undertaken to give effect to the proposed development gives rise to certain impacts. For the purpose of assessing these impacts, the project has been divided into the following phases discussed in **Table 26.**

Table 26: Project phases in a development

PHASES OF A PROJECT IN WHICH IMPACTS WILL OCCUR
Status Quo
The study area as it currently exists.
Construction Phase
This phase will include, construction, stockpiling of material, haulage of material and construction of the pipelines.
Operational Phase
The operation of the tailings and return water pipeline for the duration of the Target Operations to deposit tailings from Target plant on the Freddies 9 TSF.
The activities arising from each of the relevant phases have been included in the impacts assessment tables. The assessment endeavours to identify activities that would require environmental management

PHASES OF A PROJECT IN WHICH IMPACTS WILL OCCUR
actions to mitigate the impacts arising from them. The criteria against which the activities were assessed are given in the next section.

Assessment Criteria

The assessment of the impacts has been conducted according to a synthesis of criteria required by the guideline documents to the EIA regulations (2006) and integrated environmental management series published by the Department of Environmental Affairs and Tourism (DEAT) currently Department of Environment, Forestry and Fisheries (DEFF). In addition to this, it is a requirement of the National Environmental Management Act (NEMA) 2014 Regulations as amended, Appendices 1 and 2 that an Impact and Risk Assessment process be undertaken for the Basic Assessments and Environmental Impact Reporting. Acronyms have been used in some of the tables to abbreviate some aspects of the assessment criteria. The Assessment Criteria is based on the following:

- Nature of impact;
- Extent **(E);**
- Duration **(D)**;
- Intensity **(I);**
- Consequence **(C);** *this will be a combination of Extent **(E)**+Duration **(D)** + Intensity **(I)***
- Probability **(P)**;
- Determination of significance (with or without mitigation); *and is a combination of consequence **(C)**x Probability **(P);***
- Reversibility of impact; and
- Irreplaceable loss of resources will be defined as loss of resource for the purposes of the Impact Assessment Tables

Each of these is explained in **Table 27.**

Table 27: Assessment Criteria

ASSESSMENT CRITERIA	SCORING
a) Nature of Impact	
This is an appraisal of the type of effect the proposed activity would have on the affected environmental component. The description should include what is being affected, how and whether the impact is positive or negative	Scoring does not apply, impact will either be positive or negative
b) Extent (E)	
The physical and spatial size of the impact. This is classified as: **i) Site** The impact could affect the whole, or a measurable portion of the site. **ii) Local** The impacted area extends only as far as the activity, e.g. a footprint of the specific activity **iii) Regional** The impact could affect areas such as neighbouring farms, transport corridors and the adjoining towns. **iv) National** The impact could have an effect on South Africa.	 **1** **2** **3** **4**
c) Duration (D)	
The lifetime of the impact; this is measured in the context of the	

lifetime of the proposed project. **i) Short term** The impact will either disappear with mitigation or will be mitigated through natural processes (less than 1 year). **ii) Medium term** The impact will last up to the end of the phases, thereafter it will be entirely negated (1 to 10 years). **iii) Long term** The impact will continue or last for the entire operational life of the development but will be mitigated by direct human action or by natural processes thereafter. **iv) Permanent** Mitigation either by man or natural processes will not occur in such a way or in such a time span that the impact can be considered transient, thus beyond decommissioning.	**1** **2** **3** **4**
d) Intensity (I)	
Is the impact destructive or benign? Does it destroy the impacted environment, alter its functioning, or slightly alter it? These are rated as: **i) Low** The impact alters the affected environment in such a way that the natural processes or functions are not affected. **ii) Medium (Moderate)** The affected environment is altered, but function and process continue, albeit in a modified way. **iii) High** Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases. This will be a relative evaluation within the context of all the activities and the other impacts within the framework of the project.	**1** **2** **3**
e) Consequence of Impact (C)	
The anticipated consequence of the impact is determined using the following formula: **Consequence = Duration + Extent + Intensity** Consequence is rated as: **i) Negligible** An acceptable impact on natural systems, patterns or processes. **ii) Low** A small impact on natural systems, patterns or processes, where the environment continues to function but in a modified manner and for which mitigation is desirable but not essential **iii) Moderate** A substantial alteration of natural systems, patterns or processes,	3 4-5

where environmental functions and processes are altered such that they temporarily or permanently cease. Mitigation will be required. **iv) High** A serious alteration of natural systems, patterns or processes. Impacts may result in the irreversible damage to irreplaceable aspects if mitigation measures are not implemented. **v) Very High** Very high impact on natural systems, patterns or processes, where environmental functions and processes are altered such that could permanently cease, even with mitigation.	6-8 9-10 11-12
f) Probability (P)	
This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time. The classes are rated as follows: ***i) Improbable*** The possibility of the impact occurring is very low, due either to the circumstances, design or experience. ***ii) Probable*** There is a possibility that the impact will occur to the extent that provisions must be made. ***iii) Highly probable*** It is most likely that the impacts will occur at some or other stage of the development. Plans must be drawn up before the undertaking of the activity. ***iv) Definite*** The impact will take place regardless of any prevention plans, and mitigation actions or contingency plans are relied on to contain the effect.	1 2 3 4
h) Significance of impact with or without mitigation	

Score		Significance = Consequence x Probability					
Probability	4	Definite	4	8	12	16	20
	3	Highly probable	3	6	9	12	15
	2	Probable	2	4	6	8	10
	1	Improbable	1	2	3	4	5
			Negligible	Low	Moderate	High	Very High
			1	2	3	4	5
		Consequence					

Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the	

impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. To determine significance of the potential impact/risk, the consequence is multiplied by probability. The classes are rated as follows:	
i) No significance The impact is not substantial and does not require any mitigation. Score 1-5	1-3
ii) Low The impact is of little importance but may require limited mitigation. Score 4-6	4-6
iii) Medium (Moderate) The impact is of importance and therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels. Score 8-10	8-10
iv) High The impact is of great importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Score 12-16	12-16
v) Fatal Flaw The impact presents a fatal flaw and the entire development option or entire project proposal is unacceptable. Score 20	20
g) Reversibility of impact (R)	
The extent to which the impacts are reversible **(i) Yes** The impact is reversible within two years after construction. **(ii) No** The impact is reversible within 2 to 10 years after construction.	
g) The degree to which the impact can cause irreplaceable loss of resources	
(i) Low The impact results in the loss of resources but the natural, cultural and social processes/functions are not affected. **(ii) Medium** The loss of resources occurs but natural cultural and social processes continue, albeit in a modified manner. **(iii) High** The impact results in irreplaceable loss of resource.	

The assessment criteria used in the tables will be applied to all of the impacts and a brief descriptive review of the impacts and their significance provided in the text of the report. The overall significance of impacts will be determined by considering consequence and probability.

(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.

(Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties)

The proposed pipeline and service/maintenance road development will have a high-moderate to moderate-low impact (after mitigation) on the receiving environment. The negative impacts associated with the proposed development are provided below:

- Loss of floral habitat and species diversity.
- Loss of faunal habitat and species diversity.
- Potential loss of land capability and soil contamination.
- Potential ground water contamination.
- Potential increase in noise levels.
- Potential increase in dust levels.
- Visual intrusion and loss of aesthetic value.
- Traffic accommodation on the R30 during the installation of the pipe culvert.
- Loss and cultural and heritage resources.
- Increase in waste.

The above-mentioned impacts are expected during the operational phase of the project. However, with the application of mitigations measures as provided in the EMPr the potential impacts can be minimised or avoided. Apart from the negative impacts, the proposed project will have positive impacts. These positive impacts are as follows:

- Proposed development would create a number of local employment and business opportunities during construction.
- Opportunity for skills development and on-site training.

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

(With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment/ discussion of the mitigations or site layout alternatives available to accommodate or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered).

Mitigation measures for the proposed pipeline and service/maintenance road have been provided in the EMPr.

(ix) Motivation where no alternative sites were considered.

Only one site was considered (MR226) as the TSF 1 and 2 and the associated infrastructure (service roads, culvert, etc.,) are located in this specific mining area where the risks from TSF structural failure has been identified. The proposed pipelines should therefore be located in this mining site in order to effectively transport the tailings from the Target operations to Freddies 9 TSF and to further transport return water from the Freddies 9 dam for primary processing of a mineral. No alternative sites can be considered to address the current risk. According to the design engineers, the preferred pipeline route was considered the only technically feasible development footprint based on the reasons provided in Section G and the servitude and property ownership considerations.

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

(Provide a statement motivation the final site layout that is proposed)

- The route considered is the shortest route alignment between TSF 2 and Freddies 9 TSF thereby ensuring there is less disturbance and impacts on the natural environment. The route is further regarded as technically feasible as it is easily accessible through existing mine roads and a direct route between TSF 2 and Freddies 9 TSF. This design has also accommodated the location of the two pipelines routes parallel to each other and will thus minimise costs as there are no bend points.

i) **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.** (including (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures).

Please refer to **Section vi** regarding the Methodology used in determining the significance of environmental impacts.

j) Assessment of each identified potentially significant impact and risk

(This section of the report must consider all the known typical impacts of each of the activities (including those that could or should have been identified by knowledgeable persons) and not only those that were raised by registered interested and affected parties).

Table 28: Assessment of each identified potentially significant impact and risk

NAME OF ACTIVITY (**E.g. For prospecting -** drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route **etc…etc…etc** **E.g. For mining**,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	**POTENTIAL IMPACT** (Including the potential impacts for cumulative impacts) (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)	**SIGNIFICANCE** if not mitigated	**MITIGATION TYPE** (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. Modify through alternative method. Control through noise control Control through management and monitoring	**SIGNIFICANCE** if mitigated
Clearance and grading of service/maintenance road	Change in topography of landscape and drainage pattern due to the development of the service/maintenance road and culvert crossing the R30.	Topography	Construction	Low	• Control through the limiting of the footprint of the proposed development activities • construction activities shall be demarcated in order to restrict the excavation footprint. • Control through the appropriate rehabilitation measures	Low
			Operational	Low		Insignificant
Vegetation Clearing, removal of topsoil	Loss of floral and faunal habitat will inevitably take place during the construction and operation phases of the project, mainly as result of direct clearing of vegetation. It must be noted that no portion of the pipeline routes represents intact Vaal-Vet Sandy Grassland vegetation, and the areas listed as Irreplaceable CBAs by the provincial conservation plan exist in a modified state due to the heavy grazing of the areas, the invasion of alien species, and the additional related effects of nearby agricultural and mining activity. No SCC flora or fauna were recorded during the field survey; however, it is noted that certain SCC fauna may move through the area infrequently due to the abundance of wetland systems in the region.	Fauna and Flora habitat	Construction	Medium		Low
			Operational	Medium		Low
Vegetation Clearing, removal of topsoil	During the construction phase, Loss of floral species diversity may take place. Three habitat units are delineated for the project area: Transformed, Modified Sandy Grassland, and Seep Wetland. The Transformed habitat unit includes all areas that maintain very little to no functional vegetation, such as portions of cultivated land and areas utilised for roads and mining activity. Modified Sandy Grassland was found to occur in largely separated sections along the pipeline routes and is characterised by overgrazed and disturbed fields dominated by pioneer species. These portions do however maintain a level of ecosystem functionality, particularly towards the south of the pipeline routes around Freddies Dam, and they will be supportive of regular fauna activity.	Flora Species Diversity and SCC	Construction	Medium	• Restrict project footprint as per the layout plan. • Prevention of the disturbance of the ecosystem • Apply mitigation measures provided by the Ecological Specialists • Control through the rehabilitation of disturbed areas	Low
			Operational	Low		Insignificant
Vegetation Clearing, removal of topsoil	Loss of faunal species will likely take place during the construction and operational phases of the project as a result of clearance of vegetation, and ongoing disturbance within the project area and surrounds due to increased human activity, movement of operational vehicles and activities associated with the continued functioning of the pipeline.	Fauna Species Diversity & SCC, and habitat disturbance	Construction	Medium		Low
			Operational	Medium		Low
Vegetation clearing, Topsoil removal and stockpiling, Vehicle movement and construction of Infrastructure	During the construction and operational phased, heavy equipment traffic could potentially result in soil compaction. The loss of topsoil could potentially result in a decrease in the rehabilitation and future land use potential of land that has been disturbed Potential disturbance on soil includes compaction owing to vehicle traffic and increased surface runoff from the compacted areas. Soil pollution may emanate	Soils	Construction	Medium	• Control through the appropriate stripping and stockpiling measures • Control of the construction footprint • Control through the implementation of a Stormwater Management Plan	Low
			Operational Decommissioning and Closure	Medium		Low

NAME OF ACTIVITY **(E.g. For prospecting -** drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route **etc…etc…etc** **E.g. For mining**,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	**POTENTIAL IMPACT** (Including the potential impacts for cumulative impacts) (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)	**SIGNIFICANCE** if not mitigated	**MITIGATION TYPE** (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. Modify through alternative method. Control through noise control Control through management and monitoring	**SIGNIFICANCE** if mitigated
	from petroleum hydrocarbon contamination owing to vehicle and machinery break-down. Pollution of soils as a result of ad-hoc spills. Contamination sources are generally unpredictable and often occur as incidental spills or leaks from operational activities					
Vegetation clearing, Topsoil removal and stockpiling, Vehicle movement and construction of Infrastructure	The identified isolated seepage wetlands delineated for the project have been formed through artificial means and have only been delineated for this assessment. No functional assessment has been completed for these systems. These have been identified as an artificial isolated hillslope seepage system. Some of the systems are located adjacent to waste impoundments. Water infiltrates impoundments during rainfall events and seeps out in areas without the presence of successful trenches.	Surface water resources	Construction	Medium	• Control through the implementation of a stormwater management plan • Implementation and management through a rehabilitation and closure plan	Low
			Operational Decommissioning and Closure	Medium		Low
Clearance of vegetation, construction of infrastructure	During the construction and operational phases, potential contamination of groundwater due to spillages and leaks of hazardous substances, improper stormwater management, and fuel/oil leaks from vehicles during the operation of the pipeline.	Groundwater Resources	Construction	Medium	• Control through the implementation of a stormwater management plan • Manage all hazardous substances • Regular pipeline inspections and maintenance • Implementation and management through a rehabilitation and closure plan	Low
			Operational Decommissioning and Closure	Medium		Low
Vegetation clearance and stockpiling, Blasting (if required), and operation of machinery; demolition and/or removal of temporary infrastructure	During the construction phase of the project, the activities that will most likely generate emissions earthworks, removal of topsoil and vegetation clearance, and vehicle movement on haulage routes and public roads. In terms of the construction phase, the main sources of particulate emissions would be the haulage of material and vehicular entrainment on unsurfaced dust roads, and the public roads. These emissions will have an impact on air quality on site as well as the surrounding areas.	Air Quality	Construction	Medium	• Control through frequent dust suppression • Control through dust monitoring and recording • Speed control measures on traffic	Low
			Operational Decommissioning and Closure	Medium		Low
Blasting (if required), operation of machinery; and/or removal of temporary infrastructure	Activities undertaken during the construction will generate noise but will unlikely affect the adjacent community. Removal of existing infrastructure during rehabilitation and closure could result in noisy activities.	Noise and blasting hazard	Construction	Medium	• Noise Control through the maintenance of vehicles and equipment • Speed limits • Control through the implementation of a blast management plan	Low
			Operational Decommissioning and Closure	Low		Insignificant
		Traffic	Construction	Medium		Low

NAME OF ACTIVITY **(E.g. For prospecting -** drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route **etc…etc…etc** **E.g. For mining**,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	**POTENTIAL IMPACT** (Including the potential impacts for cumulative impacts) (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)	**SIGNIFICANCE** if not mitigated	**MITIGATION TYPE** (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. Modify through alternative method. Control through noise control Control through management and monitoring	**SIGNIFICANCE** if mitigated
The R30 road where the pipeline will cross through a culvert will require traffic management during construction. Haulage of Material and transportation	• Increase in traffic on the local road networks to due haulage. • Increase in traffic on the R30 during construction of the culvert and pipe crossing.		Operational Decommissioning and Closure	Medium	• Control through the implementation of a traffic management plan • Implementation of a traffic complaints procedure	Low
Material Stockpiles, Rehabilitation and restoration of disturbed areas, and/or removal of temporary infrastructure	• During the construction phase of the project, it is anticipated that construction vehicles in the area as well as excavations will have a potentially negative impact on the surrounding land use. • In terms of the aesthetics, the development will impact on the localised sense of place which has been scarred by mining activities and existing pipeline infrastructure. The visual intrusion is expected to be low after mitigation.	Visual and aesthetic	Construction	Medium	• Control visual intrusion by screening where possible • Implementation and management through a rehabilitation and closure plan	Low
			Operational Decommissioning and Closure	Medium		Low
Vegetation Clearing, Excavations, Construction of infrastructure	• The proposed development will require removal of topsoil and vegetation during the preparation of the service/maintenance road. During the course of such operations, it is possible that undiscovered cultural heritage material, including fossils could be unearthed.	Cultural and Heritage	Construction	Medium	• The contractors and workers should be notified that archaeological sites might be exposed during the construction activities. • Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible. • All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken.	Low
			Operational Decommissioning and Closure	Medium		Low
Vegetation Clearing, Excavations, Construction of infrastructure	Threats to palaeontological resources are earth moving equipment/machinery (for example haul trucks, front end loaders, excavators, graders, dozers) during construction and operation.	Fossil Heritage	Construction	Medium	Prevent through the reporting and evaluation of any archaeological heritage resource found on site	Low
			Operational Decommissioning and Closure	Medium		Low
Clearance of vegetation, construction of infrastructure	**Construction Phase** • Population influx due to job seekers to the area which could pose a number of risks to the local community. • Proposed development would create a number of local employment and business opportunities during construction • Opportunity for skills development and onsite training.	Socio-Economic	Construction	Medium	• Employment and procurement opportunities provided to identified communities. • The Contractor must ensure that the recruitment process is conducted through the community structures established for the contract. • engagement and complaints management procedure	Low
			Operational Decommissioning and Closure	Positive		Insignificant
Vegetation clearing	• The Clearing of site will result in waste generation (vegetation). • Building and domestic waste will be generated during the construction of pipelines • Littering and improper waste storage may attract vermin resulting in a negative visual appeal of the area. • Improper disposal of hazardous waste (e.g., chemicals, oils, soil contaminated by spillages, diesel rags).	Waste	Construction	Medium	• A waste management plan shall be compiled and implemented by the Contractor. Waste hierarchy principals-reduce, reuse, recycle shall be implemented. Recyclable waste must be kept separate from general waste and taken to a waste recovery / recycling facility.	Low
			Operational Decommissioning and Closure	Medium		Low

NAME OF ACTIVITY **(E.g. For prospecting -** drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route **etc…etc…etc** **E.g. For mining**,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	**POTENTIAL IMPACT** (Including the potential impacts for cumulative impacts) (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)	**SIGNIFICANCE** if not mitigated	**MITIGATION TYPE** (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. Modify through alternative method. Control through noise control Control through management and monitoring	**SIGNIFICANCE** if mitigated
					• Adequate storage facilities for general and hazardous waste. • Waste receptables with lids (i.e. weather and vermin proof) for management of waste on site. • Hazardous waste shall be stored in a bund wall. Disposal of all hazardous waste at a hazardous waste landfill. • General waste shall be disposed at a landfill at least weekly, or more frequently if required.	
Operation of the pipeline, Rehabilitation and restoration of disturbed areas	• Criminal activity within the proposed site is rife. The proposed development could serve as an attraction for criminal activity	Safety	Construction	Medium	• Control access to site • remedy through awareness training and signage • Appointment of Health and Safety officer to monitor safety compliance on site	Low
			Operational Decommissioning and Closure	Medium		Low

k) Summary of Specialist Reports

(This summary must be completed if any specialist reports informed the impact assessment and final site layout process and must be in the following tabular form)

Table 29: Summary of Specialist Reports

LIST OF STUDIES UNDERTAKEN	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.
Terrestrial Biodiversity Assessment undertaken by The Biodiversity Company	• The positioning of project infrastructure in relation to areas of increased ecological importance and sensitivity should be considered during the pre-construction and planning phases of the project, to determine where and if habitat loss can be avoided within certain areas. • No areas should be cleared of natural vegetation if not required for construction and operational purposes, and development footprint areas should be kept as small and compact as possible. The loss of indigenous vegetation should be limited where possible. • No natural areas on adjacent properties may be disturbed in any way and access roads towards the project area should follow existing roads and tracks and utilise existing access points to prevent clearing of additional areas. • Ecological connectivity within the project area and between the project area and adjacent properties should be considered and maintained where and if possible, to ensure faunal movement patterns are not completely restricted. • Where areas of increased ecological sensitivity can be avoided, these areas should be indicated on site and be off limits to construction vehicles and workers. • Vehicle access beyond the designated project footprint areas should be prohibited. • contractors' laydown areas and other temporary infrastructure are to be placed within areas that have already been modified where possible. • No littering or dumping of waste and construction material within natural areas beyond the project footprint areas may be allowed. • Edge effects from construction and operational activities, such as erosion and alien floral species proliferation and the spread of these within disturbed areas, should be managed throughout all the development phases through the implementation of erosion control measures where required and the implementation of an alien and invasive species control plan. • Dust suppression measures must be implemented.	x	Table 29

	• As far as possible, site restoration/ rehabilitation should take place concurrently/ progressively and as areas become available for rehabilitation. • When backfilling open voids, the surrounding topography needs to be considered and no surface depressions should remain post-closure. • Any disturbed and compacted areas outside of the project footprint areas must be ripped, reprofiled and revegetated with indigenous plant species naturally growing within the area. • All construction and operational personnel must be educated in environmental awareness and be trained to identify floral SCC known to occur in the project area, as well as floral SCC with a high probability of occurring in the project area. • No harvesting of firewood or collection of floral species from natural areas surrounding the project footprint should be allowed by construction workers. • The conservation of faunal habitat is directly linked to the reduction in faunal related impacts such as direct loss and disturbance. • Site clearance of the approved footprint must utilise a phased approach to allow faunal species to disperse from the area. • All vehicles (construction or light motor vehicles) accessing the project must adhere to a 30km/hr speed limit and vigilant driving techniques. • No wild animals may under any circumstance be handled or removed by construction workers. • Hunting/ killing/ collection of fauna is prohibited. • Any snares or traps found on or adjacent to the project area must be removed and disposed of. • Biodiversity education and awareness programmes must be implemented. This programme should form part of the staff induction in which topics such as vigilant driving techniques and the necessary procedures for working in close proximity to sensitive habitats.		
Heritage Impact Assessment Undertaken by PGS Heritage	• The study revealed that no sites, features, or objects of cultural significance were identified. The HIA conducted for this project will be submitted to the SAHRA for their comment and decision. Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.	X	Table 29
Wetland/Riparian delineation and Functional Assessment was undertaken by The Biodiversity Company	• Three habitat units are delineated for the project area: Transformed, Modified Sandy Grassland, and Seep Wetland. The Transformed habitat unit includes all areas that maintain very little to no functional vegetation, such as portions of cultivated land and areas utilised for roads and mining activity. Modified Sandy Grassland was found to occur in largely separated sections along the pipeline routes and is characterised by overgrazed and disturbed fields dominated by pioneer species. These portions do however maintain a level of ecosystem functionality, particularly towards the south of the pipeline routes around Freddies Dam, and they will be supportive of regular fauna activity. The seep wetland unit includes the three artificial wetland systems which intercept with the specified pipeline routes, as delineated and defined by the project freshwater assessment report (TBC, 2022). Although these systems were listed as 'Seriously Modified' by the wetland report, they maintain an important level of functionality which supports the local fauna species and encourages regular foraging in the area.	X	Table 29
Desktop Palaeontological Impact Assessment	• A desktop Palaeontological Assessment was undertaken. The study concluded that the potential impact of the development on fossil heritage is LOW and therefore a field survey is not necessary for this development (according to SAHRA protocol).If any palaeontological material is exposed during digging, excavating, drilling or blasting SAHRA must be notified. All construction activities must be stopped, and a palaeontologist should be called in to determine proper mitigation measures.	X	Table 29

Specialist Reports are attached to **Appendix G**.

In addition to the Specialist Studies undertaken, according to Regulation 16(1)(v) of the NEMA EIA Regulations 2014, as amended, an Application for Environmental Authorisation must be accompanied by a 'the report generated by the national web based environmental screening tool. The custodian of this report is the Department of Forestry, Fisheries and the Environment. The results of the tool are indicated in the Report attached as **Appendix I.**

Page 8 of 15 of the DFFE Screening Report indicates that certain Specialist Assessments must be undertaken for the proposed development. There is however an allowance of the EAP to motivate for the reasons for not including certain assessments in the assessment report. **Table 30** presents these Specialist Assessments/ Studies as well as the motivations behind the EAP's decision of the recommendations behind the undertaking or non-undertaking of certain Specialist Assessments/ Studies.

Table 30: DFFE Screening Tool, Summary of discussions regarding the undertaking of Specialist Assessments

No	Specialist Assessment	EAP Motivation
1	Agricultural Impact Assessment	The proposed site will be constructed within an area that has already been disturbed by mining activities. The study is required for footprint developments and the proposed pipeline is a linear activity. Based on the above, the EAP suggests that an Agricultural Impact Assessment is not required.
2	Archaeological and Cultural Heritage Impact Assessment	The Archaeological and Cultural Heritage theme sensitivity is not shown on the DFFE screening tool. However, in terms of Section 38 (1) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) a Heritage Impact Assessment is required for a linear development in excess of 1km. A Phase 1 Heritage Impact Assessment has been undertaken. The report is attached to **Appendix G**.
3	Palaeontology Impact Assessment	A desktop Palaeontological Impact Assessment has been undertaken for the proposed pipeline and service/maintenance road. The specialist report is attached to **Appendix G.**
4	Terrestrial Biodiversity Impact Assessment	According to the DFFE screening tool, the Terrestrial Biodiversity has a Very High sensitivity. A Terrestrial Biodiversity Assessment has been undertaken. The report is attached to **Appendix G**.
5	Aquatic Biodiversity Impact Assessment	According to the DFFE screening tool, the aquatic biodiversity theme is low, however an aquatic assessment was undertaken for the Development including wetland impacts. A Freshwater impact Assessment has been undertaken. The report is attached to **Appendix G**.
6	Hydrology Assessment	The proposed project will not impact on any perennial water courses; hence a hydrological assessment is not required.
7	Geotechnical Assessment	A Geotechnical Investigation Is not required as the proposed pipeline will be placed above ground.
8	Climate Impact Assessment	A Climate Change assessment will not be required.

No	Specialist Assessment	EAP Motivation
9	Socio-Economic Assessment	In terms of land use change, it is not anticipated that the pipeline and service/maintenance road will **not** lead to a drastic land use change It is the opinion of the EAP that a Socio-Economic Assessment is not required.
10	Plant Species Assessment	According to the DFFE screening tool, the plant species theme has a medium sensitivity. A Terrestrial Biodiversity Assessment has been commissioned. The report is provided in **Appendix G**.
11	Animal Species Assessment	According to the DFFE screening tool, the animal species theme has a medium sensitivity. A Terrestrial Biodiversity Assessment (Fauna and Flora) has been undertaken. The report is provided in **Appendix G**.

l) Environmental impact statement

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

Section j of the report provides the significance of impacts pre and post mitigation. The preferred route alternative partially falls within a Critical Biodiversity Area or within an Ecological Support Area but the majority of the development footprint is modified. The terrestrial biodiversity theme sensitivity as indicated in the screening report (compiled by the National Web based Environmental Screening Tool) was derived to be 'Very High'. The completion of the terrestrial biodiversity desktop and studies disputes the 'Very High' sensitivity presented by the screening tool report, as relevant to the proposed footprint areas. As discussed above, the proposed footprint area is largely degraded and as such it is assigned an overall sensitivity rating of 'Very Low' to 'Low'. The screening report classified the animal species theme sensitivity as being of a 'High' sensitivity, and the plant species theme as 'Low'. Following the field survey findings, both the animal and plant species themes should be classified as 'Low' sensitivity. This is due to the fact that the frequent occurrence of sensitive SCC is considered unlikely within the local habitats as they maintain only a low level of functionality.

The proposed site is located within the regulated area in terms of the National Water Act. Other artificial seeps are located next to current and historic evaporation ponds or pollution control facilities. Water pumped into these facilities is only held in place by means of artificial barriers made of soil and rock, allowing for all water pumped into these facilities to seep through the walls of the impoundments. A water use license authorisation process is underway.

The study revealed that no sites, features, or objects of cultural significance were identified. The HIA conducted for this project will be submitted to the SAHRA for their comment and decision.

Due to the proposed site being largely modified, the impact assessment revealed that certain proposed activities without mitigation are expected to have impacts with medium significance ratings in relation to Fauna and Flora habitat. The overall impacts of the proposed development will have medium to low impacts on the bio-physical environment and some of the impacts can be reduced to a low significance provided all recommended mitigation are adhered to.

It must be noted that there are certain sensitivities on site that are unavoidable. In order to protect biodiversity and conserve sensitive environments during development, steps that should be followed are to firstly avoid, then minimize, then repair or restore, and finally compensate for, or offset (if possible) the negative effects of any development on biodiversity. Thus, where the impact is unavoidable, the impacts must be minimized and the unavoidable and unforeseen impacts restored or rehabilitated.

(ii) Final Site Map

Figure 377 provides a Site layout plan of the preferred alternative.

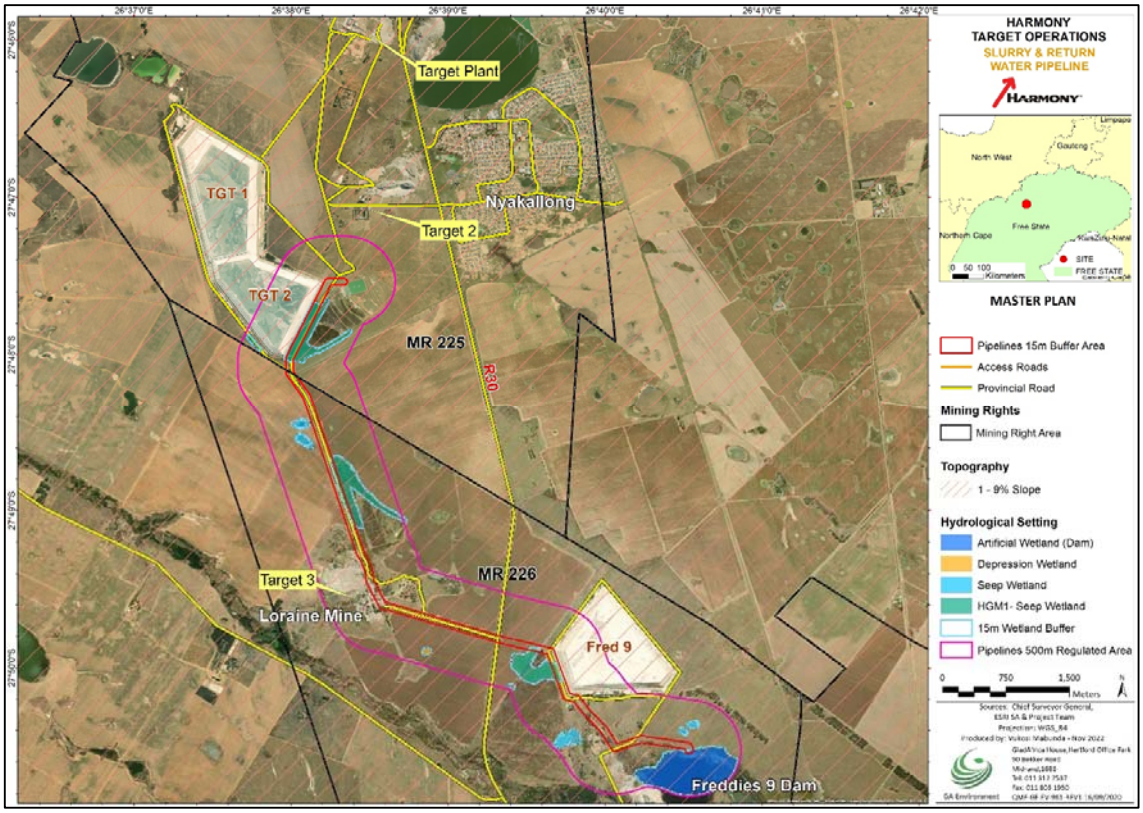

Figure 37: Final Site Layout Map

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

A summary of the positive and negative have been provided in **Section h (vii).**

m) 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**.**

The purpose of the EMPr is to provide relevant management measures to conduct activities with due care and diligence, as well as avoid/ limit any adverse impacts of the pipeline and service and maintenance road. The EMPr is compiled to help control impacts that may occur to meet acceptable standards, both as a legal and social responsibility to the environment within which the activities take place.

The objectives of the EMPr are as follows:

- To ensure compliance with applicable legislation and/or guidelines.
- To ensure that the roles and responsibilities of the various parties involved in the implementation of the EMPr are clearly outlined.
- To reduce adverse environmental impacts as a result of the project activities; and

- To ensure continuous improvement in terms of the environmental performance of the project.

The following environmental management objectives are recommended for the proposed pipeline and service/ maintenance road development and associated infrastructure:

- Alien plant monitoring should take place after construction, throughout the lifecycle of the pipeline and service/ maintenance road
- Monitor soils so as to avoid unnecessary erosion, and implement erosion control measures to preserve the quality of the soil for rehabilitation;
- Development planning must restrict the area of impact to minimum and designated areas only;
- Monitor and prevent contamination and undertake appropriate remedial actions;
- Limit the visual and noise impact on receptors;
- Avoid impact on possible heritage finds;
- Promote health and safety of workers; and
- Limit dust and other emissions to within allowable limits.

n) Aspects for inclusion as conditions of Authorisation.

Any aspects which must be made conditions of the Environmental Authorisation

The following aspects have been noted by the EAP for inclusion as conditions of the Environmental Authorisation for pipeline and service/ maintenance road:

- An Environmental Management Programme (EMP) for the construction and operational phases must be implemented for the duration of the proposed project. The EMPr is attached to Appendix H.
- Implementation of the EMPr for the entire life-cycle (i.e., construction, operation, rehabilitation and closure) of the project is considered to be vital in achieving the appropriate environmental management standards as detailed for this project.
- Harmony is not negated from complying with any other statutory requirements that is applicable to the undertaking of the activity. All necessary permits, licences and approvals must be obtained prior to the commencement of construction.
- The proponent must appoint a suitably experienced Environmental Control Officer (ECO) for the construction phase of the development that will have the responsibility to ensure that the mitigation / rehabilitation measures and recommendations are implemented and to ensure compliance with the provisions of the EMPr.
- Should the presence of any floral or faunal SCC not recorded during the current study be confirmed within the project area, rescue and relocation of these species must take place under the supervision of a suitable qualified botanist or faunal specialist and with the required permits in place if necessary, and the existing management strategy must be adapted to protect such species.
- Construction phase monitoring should include monthly alien and invasive species assessments, including an assessment of eradication and control measures implemented, within the area surrounding the development footprint.
- All development activities must be monitored to ensure that the footprint areas do not exceed approved areas.
- The identified wetlands must be checked regularly for erosion during the operational phase of the project and any erosion noted must be treated immediately using soft engineering techniques.
- All declared alien plants must be identified and managed in accordance with the Conservation of Agricultural Resources Act, 1983 (Act No 43 of 1994), and the implementation of a monitoring programme in this regard is recommended.
- Ecological connectivity within the project area and between the project area and adjacent properties should be considered and maintained where and if possible, to ensure faunal movement patterns are not completely restricted.

- Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner and the Provincial Heritage Resource Authority so that an investigation and evaluation of the finds can be made.
- A public complaints register must be available on site to record any issues of concern from the public regarding the project during construction period.
- Implementation of the environmental awareness education to the contractor's during and prior to construction
- The Contractor must ensure that the recruitment process is conducted through the community structures established for the contract.

o) Description of any assumptions, uncertainties and gaps in knowledge.

(Which relate to the assessment and mitigation measures proposed)

The following assumption and limitations have been identified for the proposed pipeline and service/ maintenance road:

Assumptions

- The report has been compiled based on the assumption that the Design Engineers have provided all required information to undertake a complete and accurate assessment.
- The EAP and specialists have identified all possible impacts based on the information provided and these have been assessed and rated; accordingly, and
- Due to the complexity of natural ecosystems and seasonality of species, it is possible that some aspects pertaining to terrestrial biodiversity, including certain floral species, may have been overlooked during the field assessment, however all effort was made by the consultants to gather and convey accurate information, although the possibility exists that additional information with regard to the project area may come to light at a later stage. It is also important to note that the majority of floral SCC are also known to be extremely seasonal and only flower during specific periods of the year. Prior information on potential threatened flora that may occur in the project area was however known and special emphasis was placed in searching for such species during the field assessment.

Uncertainties

- The EMPr that forms part of this Basic Assessment Report provides an assessment of impacts and mitigation measures based on the specialist assessment, site visits, and public participation process. As the impact assessment is a predictive tool, the applicant shall ensure that the require monitoring of the project is undertaken to determine the validity and accuracy of the predictions made. The EMPr shall be improved and refined regularly to ensure that management measures are effective to avoid, minimize and mitigate impacts; and that corrective action is being undertaken to address shortcomings.

Gaps in knowledge

- In accordance with the Protection of Personal Information Act (Act 4 of 2013), personal information (emails, contact numbers, address) have been blanked out and excluded from Public Participation section and will only be provided to DMRE officials;
- Personal information of I&APs made available to the competent authority shall only be used by the authorities to confirm or obtain information regarding this specific project;

p) 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 reasoned opinion of the EAP that the project shall be authorised due to the following reasons:

- Should the mitigation measures and monitoring programmes proposed in this document be implemented on site, no fatal flaws could be identified that were deemed so severe as to prevent the activity from continuing.
- Although the proposed development has been assessed to pose medium to low negative environmental or social impacts these can be mitigated to very low or insignificant levels, whereas there are significant positive socio-economic impacts that will emanate from the proposed project, and the development will contribute towards the local economy.

(ii) Conditions that must be included in the authorisation

Conditions to be included in the authorisation have been included in Section N above.

q) Period for which the Environmental Authorisation is required.

Environmental Authorisation is required for 10 years.

r) 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.

The undertaking is provided at the end of the EMPr and is applicable to the BAR and the EMPr.

s) Financial Provision

State the amount that is required to both manage and rehabilitate the environment in respect of rehabilitation.

The quantum and calculations of the financial provisions required to be submitted by Harmony in terms of Regulation 53 of the MPRDA Act 28 of 2002 will be included in the FBAR submitted to the DMRE. A total quantum will be provided for rehabilitation and remediation of the environmental impacts for the development of the pipes and associated damage as well as close-out.

(i) Explain how the aforesaid amount was derived.

Refer to the comment provided in Section S, under financial provision.

(ii) Confirm that this amount can be provided for from operating expenditure.
(Confirm that the amount, is anticipated to be an operating cost and is provided for as such in the Mining work programme, Financial and Technical Competence Report or Prospecting Work Programme as the case may be).

Refer to the comment provided in Section S, under financial provision.

t) 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.**
(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as an Appendix

The rights and interests of other parties will not be affected as the proposed amendment falls within the same approved mining area which will not be extended. The proposed development is for the construction of a pipeline which will ensure the structural integrity of Target slimes dam 1 and 2 which have reached their final design height and become unserviceable by transporting tailings from these facilities to the Freddies 9 TSF. The amendment will include public participation as part of a Basic Assessment process which will be undertaken in terms of the NEMA EIA Regulations, 2014 as amended.

The public participation process (PPP) provides Interested and Affected Parties (I&APs), including DMRE as the Competent Authority, with an opportunity to provide comments and to raise issues of concern about the development or make suggestions on the processes and proposed activities. Any I&APs can therefore register on the project to obtain ongoing information about the BA. Other documents that will be drafted as part of the project notification phase include a Site Notice that will be mounted on-site and its immediate surrounding areas and a local/regional newspaper advertisement. The process also requires the use of any other PPP methods such as Focus groups and/or Public Meetings where the need for these arises. These activities will ensure that the rights and interests of other parties are adequately addressed during this process.

Upon DMRE's issuing of the Environmental Authorisation (permission to commence with the development), all registered I&APs will be informed of the decision and provided with an opportunity to appeal the decision.

(2) **Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act.** (Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) with the exception of the national estate contemplated in section 3(2)(i)(vi) and (vii) of that Act, attach the investigation report as Appendix 2.19.2 and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12.herein).

A Heritage Impact Assessment was undertaken by PGS Heritage. The HIA is included as **Appendix G**. The study revealed that no sites, features, or objects of cultural significance were identified. The HIA conducted for this project will be submitted to the SAHRA for their comment and decision.

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

(the EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation as Appendix 4).

Not applicable as alternatives have been assessed.

PART B: ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1) Draft environmental management programme.

a) **Details of the EAP,** (Confirm that the requirement for the provision of the details and expertise of the EAP are already included in PART A, section 1(a) herein as required).

The details and expertise of the EAP are included in Part A, section 3(a).

b) **Description of the Aspects of the Activity** (Confirm that the requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, section (1)(h) herein as required).

The aspects of the activity that are covered by the draft EMPr is included in Part A (Section J).

c) Composite Map

(Provide a map (Attached as an Appendix) at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers)

The composite map is attached as **Appendix C** and provided in **Figure 38** below.

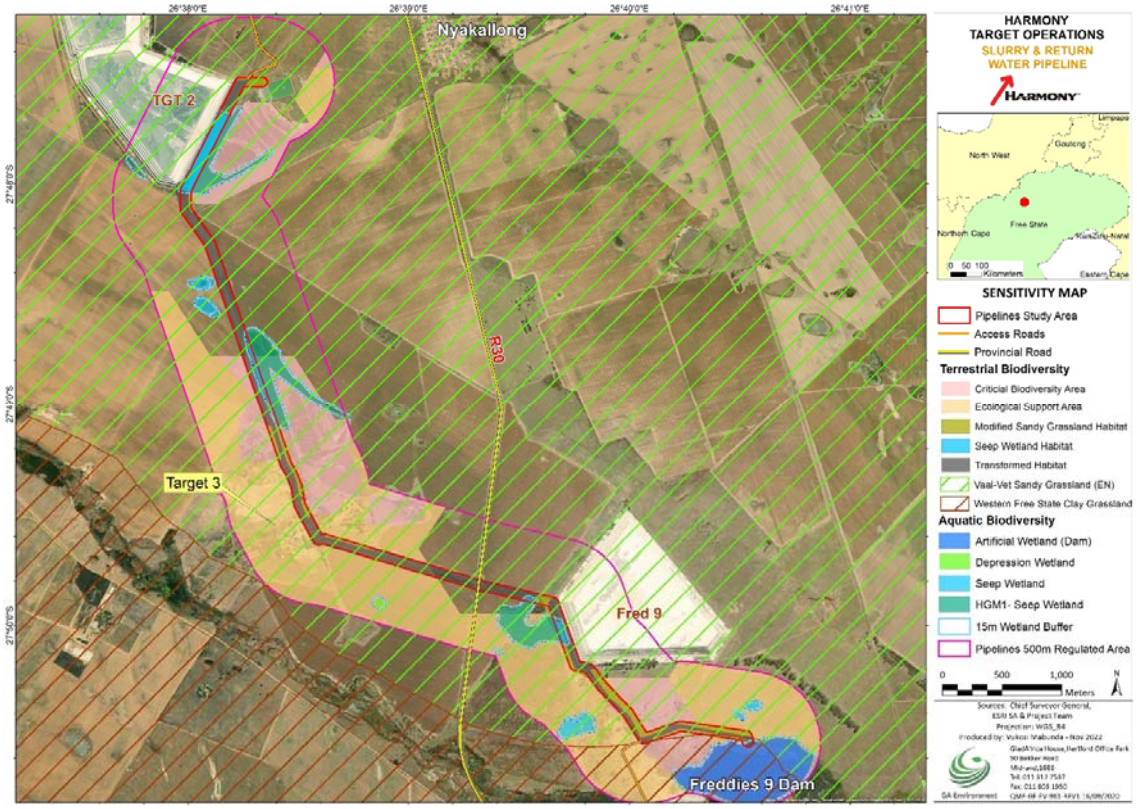

Figure 38: Composite Map of the proposed pipeline and service/maintenance road

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)

The following closure objectives for the proposed pipeline and service/maintenance road are to:

- The project area and immediate surrounds must be monitored for erosion and where encountered; immediate rectification must take place.
- The project area and immediate surrounds must be monitored for invasive floral species, and where encountered, these should be eradicated immediately.
- All temporary structures (ablution facilities, refuse bin, contractors office) shall be dismantled and removed).

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

Water may be required for dust suppression especially during the development of the service/maintenance road. The appointed Contractor responsible for the proposed pipeline and service/maintenance road will be responsible for ensuring that the relevant permits/authorisations are in place based on their assessment of suitable water sources.

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

As provided in **Section (iV) 1**, an application for a water use license in terms of Section 21 (c) and (i) has been submitted to the Department of Water and Sanitation.

iv). Impacts to be mitigated in their respective phases

Measures to rehabilitate the environment affected by the undertaking of any listed activity

Table 31: Impacts to be mitigated in their Respective Phases

ACTIVITIES **(E.g. For prospecting -** drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route **etc…etc…etc** **E.g. For mining**,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	**PHASE** (of operation in which activity will take place. State; Planning and design, Pre-Construction‘ Construction, Operational, Rehabilitation, Closure, Post closure).	**ASPECTS AFFECTED**	**SIZE AND SCALE of disturbance** (volumes, tonnages and hectares or m²)	**MITIGATION MEASURES** (describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-.. Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
Removal and management of topsoil	Operational, Decommissioning and Closure	Soil	Approximately 4.9 ha	• Edge effects from construction and operational activities, such as erosion should be managed throughout all the development phases through the implementation of erosion control measures where required and the implementation of an alien and invasive species control plan.	Compliance with the Mitigation measures provided in the BAR	
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	Operational, Construction; Decommissioning and Closure	Loss of Faunal and Floral habitat	Approximately 4.9 ha	• The positioning of project infrastructure in relation to areas of increased ecological importance and sensitivity should be considered during the pre-construction and planning phases of the project, to determine where and if habitat loss can be avoided within certain areas. • No areas should be cleared of natural vegetation if not required for construction and operational purposes, and development footprint areas should be kept as small and compact as possible. The loss of indigenous vegetation should be limited where possible. • No natural areas on adjacent properties may be disturbed in any way and access roads towards the project area should follow existing roads and tracks and utilise existing access points to prevent clearing of additional areas. • Ecological connectivity within the project area and between the project area and adjacent properties should be considered and maintained where and if possible, to ensure faunal movement patterns are not completely restricted. • Where areas of increased ecological sensitivity can be avoided, these areas should be indicated on site and be off limits to construction vehicles and workers. • Vehicle access beyond the designated project footprint areas should be prohibited. • Contractors’ laydown areas and other temporary infrastructure are to be placed within areas that have already been modified where possible. • No littering or dumping of waste and construction material within natural areas beyond the project footprint areas may be allowed. • Edge effects from construction and operational activities, such as erosion and alien floral species proliferation and the spread of these within disturbed areas, should be managed throughout all the development phases through the implementation of erosion control measures where required and the implementation of an alien and invasive species control plan. • Dust suppression measures must be implemented.	Compliance with the Mitigation measures provided in the BAR Compliance with the mitigations provided by the specialist	

ACTIVITIES **(E.g. For prospecting -** drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route **etc…etc…etc** **E.g. For mining**,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	**PHASE** (of operation in which activity will take place. State; Planning and design, Pre-Construction‘ Construction, Operational, Rehabilitation, Closure, Post closure).	**ASPECTS AFFECTED**	**SIZE AND SCALE of disturbance** (volumes, tonnages and hectares or m²)	**MITIGATION MEASURES** (describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-.. Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
				• As far as possible, site restoration/ rehabilitation should take place concurrently/ progressively and as areas become available for rehabilitation. • When backfilling open voids, the surrounding topography needs to be considered and no surface depressions should remain post-closure. • The rehabilitation surface should be sloped and shaped in such a way to be free draining, to prevent erosion and to a degree which will support vegetation establishment. • Revegetation should, as a minimum, comprise direct seeding of an indigenous grass seed mixture comprising grass species recorded in the study area or species representative of the Vaal-Vet Sandy Grassland vegetation type. • Important plant taxa are those species that have a high abundance, a frequent occurrence, or are prominent in the landscape within a particular vegetation type (Mucina & Rutherford, 2006). The following species are considered important in the Vaal-Vet Sandy Grassland vegetation type (d = dominant): Graminoids: *Anthephora pubescens (d), Aristida congesta (d), Chloris virgata (d), Cymbopogon caesius (d), Cynodon dactylon (d), Digitaria argyrograpta (d), Elionurus muticus (d), Eragrostis chloromelas (d), E. lehmanniana (d), E. plana (d), E. trichophora (d), Heteropogon contortus (d), Panicum gilvum (d), Setaria sphacelata (d), Themeda triandra (d), Tragus berteronianus (d), Brachiaria serrata, Cymbopogon pospischilii, Digitaria eriantha, Eragrostis curvula, E. obtusa, E. superba, Panicum coloratum, Pogonarthria squarrosa, Trichoneura grandiglumis, Triraphis andropogonoides.* Herbs: *Stachys spathulata (d), Barleria macrostegia, Berkheya onopordifolia var. onopordifolia, Chamaesyce inaequilatera, Geigeria aspera var. aspera, Helichrysum caespititium, Hermannia depressa, Hibiscus pusillus, Monsonia burkeana, Rhynchosia adenodes, Selago densiflora, Vernonia oligocephala.* Geophytic Herbs: *Bulbine narcissifolia, Ledebouria marginata.* Succulent Herb: *Tripteris aghillana var. integrifolia.* Low Shrubs: *Felicia muricata (d), Pentzia globosa (d), Anthospermum rigidum subsp. pumilum, Helichrysum dregeanum, H. paronychioides, Ziziphus zeyheriana.* Endemic Taxon: Herb: *Lessertia phillipsiana.*		

ACTIVITIES **(E.g. For prospecting -** drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route **etc…etc…etc** **E.g. For mining**,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	**PHASE** (of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure).	**ASPECTS AFFECTED**	**SIZE AND SCALE of disturbance** (volumes, tonnages and hectares or m²)	**MITIGATION MEASURES** (describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-.. Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
				• The post-rehabilitation landscape should be capable of supporting a self-sustaining ecosystem. • Any disturbed and compacted areas outside of the project footprint areas must be ripped, reprofiled and revegetated with indigenous plant species naturally growing within the area.		
Vegetation Clearing, removal of topsoil and stockpiling,	Construction, Operational; Decommissioning and Closure	Loss of floral Species diversity and Floral SCC	Approximately 4.9ha	• The conservation of faunal habitat is directly linked to the reduction in faunal related impacts such as direct loss and disturbance. • Site clearance of the approved footprint must utilise a phased approach to allow faunal species to disperse from the area. With regards to pipeline and service/maintenance road site clearance should proceed from the centre of the site moving outwards, where feasible, to allow fauna to move into adjacent habitats that will not be affected by the proposed project. • All vehicles (construction or light motor vehicles) accessing the project must adhere to a 30km/hr speed limit and vigilant driving techniques. • No wild animals may under any circumstance be handled or removed by construction workers. • Hunting/ killing/ collection of fauna is prohibited. • Any snares or traps found on or adjacent to the project area must be removed and disposed of. • Biodiversity education and awareness programmes must be implemented. This programme should form part of the staff induction in which topics such as vigilant driving techniques and the necessary procedures for working in close proximity to sensitive habitats.	Compliance with the Mitigation measures provided in the BAR Compliance with the mitigations provided by the specialist	
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	Construction, Operational,	Loss of faunal species diversity, SCC and disturbance to Faunal Communities	Approximately 4.9ha	• The conservation of faunal habitat is directly linked to the reduction in faunal related impacts such as direct loss and disturbance. • All vehicles (construction or light motor vehicles) accessing the project must adhere to a 30km/hr speed limit and vigilant driving techniques. • No wild animals may under any circumstance be handled or removed by construction workers. • Hunting/ killing/ collection of fauna is prohibited. • Any snares or traps found on or adjacent to the project area must be removed and disposed of. • Disturbance to sensitive habitats must be avoided and the project footprint must be clearly demarcated. • No wild animals may under any circumstance be handled or be interfered with by construction workers or any personnel. • Construction activities should be timed to coincide with the period when Red List bird species that could potentially occur on site are unlikely to be breeding, if feasible • In order to reduce noise pollution, proper maintenance of equipment is required, and the implementation of low noise techniques is recommended.	Compliance with the Mitigation measures provided in the BAR Compliance with the mitigations provided by the specialist	

ACTIVITIES **(E.g. For prospecting -** drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route **etc…etc…etc** **E.g. For mining**,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	**PHASE** (of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure).	**ASPECTS AFFECTED**	**SIZE AND SCALE of disturbance** (volumes, tonnages and hectares or m²)	**MITIGATION MEASURES** (describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-.. Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
				• Any faunal species located on the site during the construction phase, which cannot relocate themselves (e.g. fossorial species), must be moved to a more suitable location. This should be undertaken by a suitable qualified ecologist/faunal specialist. • No dumping of waste may take place outside of the project area and any accidental spills of hazardous waste must be immediately cleaned through an appropriate and approved plan.		
Vegetation clearing, Topsoil removal and stockpiling, Vehicle movement and construction of Infrastructure	Construction, Operational, Decommissioning and Closure	Soils	Approximately 4.9ha	• The site-specific stormwater management plan must be compiled and implemented by the Contractor to take the increased surface water run-off rates and volumes and their erosion potential into consideration. • Drip trays shall be provided in construction areas for stationary plant and for "parked" plant; Drip trays, sumps and bunds must be emptied regularly, especially before a known rain event and after a rain event, and the contents disposed of at a licensed disposal facility. • All vehicles and equipment shall be kept in good working order and serviced regularly; Leaking equipment shall be repaired immediately or removed from the Site. • Ensuring that the development is kept within the Construction footprint.	Compliance with the Mitigation measures provided in the BAR	
Vegetation clearing, Topsoil removal and stockpiling, Vehicle movement and construction of Infrastructure	Construction, Operational, Decommissioning and Closure	Land Capability	Approximately 4.9ha	• Reinstatement and rehabilitation of disturbed land. • Take necessary steps to prevent negative impact on surrounding land by ensuring that the development is kept within the Construction footprint. • Closure planning to incorporate measures to achieve future land use plans.	Compliance with the Mitigation measures provided in the BAR	
Vegetation clearing, Topsoil removal and stockpiling, Vehicle movement and construction of Infrastructure	Construction, Operational, Decommissioning and Closure	Surface Water Resources	Approximately 4.9ha	• Effective stormwater management should be a priority during the construction phase. This should be monitored as part of the EMP.	Compliance with the Mitigation measures provided in the BAR	
Vegetation clearing, Topsoil removal and stockpiling, Vehicle movement and construction of Infrastructure	Construction, Operational, Decommissioning and Closure	Ground Water Resources	Approximately 4.9ha	• Emergency machinery and equipment maintenance shall be conducted over a drip tray, or a PVC lining to prevent soil and water contamination. • Effective stormwater management should be a priority during the construction and operational phase. • Material Safety Data Sheets for the item(s) spilled will be consulted for information concerning clean up requirements to ensure correct clean up procedure.	Compliance with the Mitigation measures provided in the BAR	
Vegetation clearance and stockpiling, Blasting, operation of machinery; demolition and/or removal of temporary infrastructure	Construction, Operational, Decommissioning and Closure	Air Quality	Approximately 4.9ha	• Implement dust suppression measures in all areas that will be affected by construction activities and where dust will be generated. Dust suppression must also be undertaken during windy and dry weather conditions. • The Contractor shall document any air quality / dust complaints raised by communities and record them on a grievance register sheet. Any dust related grievances raised shall be investigated. • If the use of watering techniques on exposed open earthworks is not feasible and if it becomes evident that dust emissions from these exposed areas are resulting in an impact to local residents, then the use of surface binding agents shall be considered. • Restrict the project footprint to only what is required. • Heavy vehicles and machinery should be serviced regularly to minimise exhaust fume pollution.	• Dust suppression controls National Dust Control Regulations (GNR 827 of November 2013) • Compliance with the Mitigation measures provided in the EIR.	

ACTIVITIES **(E.g. For prospecting -** drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route **etc…etc…etc** **E.g. For mining**,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	**PHASE** (of operation in which activity will take place. State; Planning and design, Pre-Construction‘ Construction, Operational, Rehabilitation, Closure, Post closure).	**ASPECTS AFFECTED**	**SIZE AND SCALE of disturbance** (volumes, tonnages and hectares or m²)	**MITIGATION MEASURES** (describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-.. Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
				• Diesel generators shall be subject to routine maintenance to keep the engines in optimum working order.		
Vegetation clearance and stockpiling, Blasting (if necessary), operation of machinery; demolition and/or removal of temporary infrastructure	Construction, Operational, Decommissioning and Closure	Noise receptors	Approximately 4.9ha	• A conservative vehicle maintenance schedule will be developed that seeks to reduce any increase in noise / vibration outputs due to ‘wear and tear’. • The informal use of truck honking systems will be prohibited (especially when in or passing residential areas or schools) and will only be used to prevent vehicle / pedestrian collision. • The excessive idling of stationary trucks will be prevented.	• Noise standard requirements of the MHSA • Compliance with the Mitigation measures provided in the EIR.	
Vegetation Clearing, Excavations, Construction of infrastructure	Construction, Operational, Decommissioning and Closure	Traffic	Approximately 4.9ha	• Movement of haulage vehicles shall be restricted to off peak traffic times. • Implementation of a traffic complaints procedure. • A traffic management plan shall be compiled and implemented by the Contractor. • The number of haulage vehicles shall be controlled per day.	• Compliance with the Mitigation measures provided in the BAR • Traffic Management Plan	
Vegetation Clearing, Excavations, Construction of infrastructure	Construction, Operational, Decommissioning and Closure	Visual and aesthetic	Approximately 4.9ha	• Develop material stockpiles only in areas designated on the site plan. • Ongoing clearing of alien invasive vegetation in the disturbed areas associated with the works. • Control visual intrusion by screening of the site where possible, e.g., screen fencing and earth bunds shall be used where topographically feasible • Reinstatement and rehabilitation of disturbed areas with vegetation as per the rehabilitation plan or as soon as particle.	• Compliance with the Mitigation measures provided in the BAR • Contractor method statement to control and management visual intrusion	
Vegetation Clearing, Excavations, Construction of infrastructure	Operational, Construction, Decommissioning and Closure	Heritage and cultural resources	Approximately 4.9ha	• Known sites should be clearly marked in order that they can be avoided during construction activities. • The contractors and workers should be notified that archaeological sites might be exposed during the construction activities. • Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible. • All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken. • Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site. • Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51. (1).	• Compliance with the Mitigation measures provided in the BAR. • Compliance with the mitigations provided by Heritage specialist	
Vegetation Clearing, Excavations, Construction of infrastructure	Operational, Construction,	Palaeontological Impacts	Approximately 4.9ha	• If any palaeontological material is exposed during digging, excavating, drilling or blasting SAHRA must be notified. All construction activities must be stopped and a palaeontologist should be called in to determine proper mitigation measures, • Should Fossils be unearthed the Contractor shall notify the Free state Provincial Heritage Resource Agency and specialists to further investigate; • The area must be fenced-off with a 30 m barrier and the construction workers must be informed that this is a no-go area.	• Compliance with the Mitigation measures provided in the BAR. • Compliance with the mitigations provided by Heritage specialist	

ACTIVITIES **(E.g. For prospecting -** drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route **etc…etc…etc** **E.g. For mining**,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	**PHASE** (of operation in which activity will take place. State; Planning and design, Pre-Construction‘ Construction, Operational, Rehabilitation, Closure, Post closure).	**ASPECTS AFFECTED**	**SIZE AND SCALE of disturbance** (volumes, tonnages and hectares or m²)	**MITIGATION MEASURES** (describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-.. Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
Clearance of vegetation, construction of infrastructure Excavations and stockpiling	Construction; Operational, Decommissioning and Closure	Socio-Economic	Approximately 4.9ha	• Employment and procurement opportunities provided to identified communities. • The Contractor must ensure that the recruitment process is conducted through the community structures established for the contract.	• Compliance with the Mitigation measures provided in the BAR.	
Vegetation clearing, Excavations, demolition and/or removal of temporary infrastructure	Construction, Operational, Decommissioning and Closure	Waste Generation	Approximately 4.9ha	• A waste management plan shall be compiled and implemented by the Contractor. Waste hierarchy principals-reduce, reuse, recycle shall be implemented. Recyclable waste must be kept separate from general waste and taken to a waste recovery / recycling facility. • Adequate storage facilities for general and hazardous waste. • Waste receptables with lids (i.e. weather and vermin proof) for management of waste on site. • Hazardous waste shall be stored in a bund wall. Disposal of all hazardous waste at a hazardous waste landfill. • General waste shall be disposed at a landfill at least weekly, or more frequently if required.	• Compliance with the Mitigation measures provided in the BAR.	
Vegetation clearing, Excavations, demolition and/or removal of temporary infrastructure	Construction, Operational, Decommissioning and Closure	Safety	Approximately 4.9ha	• The pipes shall be monitored regularly for vandalism. • Suitable Personal Protective Equipment (PPE) must be worn at all times by all employees on site during the construction and maintenance phases of the project. • With the exception of the project team members, no persons should be allowed to enter the construction site area. • The site and crew are to be managed in strict accordance with the MHS Act. • The contractor must ensure that all emergency procedures are in place prior to commencing work. Emergency procedures must include (but not be limited to) fire, spills, contamination of soil, accidents to employees and limiting casual access to the construction site for workers, use of hazardous substances and materials, etc. • The Contractor must ensure that lists of all emergency telephone numbers / contact persons are kept up to date and that all numbers and names are posted at relevant locations throughout the construction site. • The nearest emergency service provider must be identified during all phases of the project as well as its capacity and the magnitude of accidents it will be able to handle. The contact details of this emergency centre, including police and ambulance services must be available at prominent locations around the construction site.	• Compliance with the Mitigation measures provided in the BAR.	

e) Impact Management Outcomes

(A description of impact management outcomes, identifying the standard of impact management required for the aspects contemplated in paragraph

Table 32: Impact Management Outcomes

ACTIVITY (whether listed or not listed). **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.).**	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)**	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated **(e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)**	**MITIGATION TYPE** **(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g.** **□ Modify through alternative method.** **□ Control through noise control** **□ Control through management and monitoring** **□ Remedy through rehabilitation.**	**STANDARD TO BE ACHIEVED** **(Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.**	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-. Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	Change in topography	Topography	Operational,	• Control through the limiting of the footprint of the proposed mining activities. • Control through the appropriate rehabilitation measures.	• Compliance with the Mitigation measures provided in the BAR.	Throughout construction, operational and decommissioning and closure phases
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	Removal of geological material	Geology	Decommissioning and Closure	• Control through the limiting of the footprint of the proposed mining activities. • Control through the appropriate rehabilitation measures.	• Compliance with the Mitigation measures provided in the BAR.	
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	Loss of floral and faunal habitat	Fauna and Flora	Operational, Construction	• Restrict project footprint. • Prevention of the disturbance of the ecosystem. • Control through the rehabilitation of disturbed areas.	• Compliance with the Mitigation measures provided in the BAR. • Compliance with the mitigations provided by the specialist	
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	Loss of floral Species diversity and Floral SCC	Flora	Operational, Construction	• Restrict project footprint. • Prevention of the disturbance of the ecosystem. • Control through the rehabilitation of disturbed areas.	• Compliance with the Mitigation measures provided in the BAR. • Compliance with the mitigations provided by the specialist	
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	Loss of faunal species and disturbance to faunal communities	Fauna	Operational, Construction	• Restrict project footprint. • Prevention of the disturbance of the ecosystem. • Control through the rehabilitation of disturbed areas.	• Compliance with the Mitigation measures provided in the BAR. • Compliance with the mitigations provided by the specialist	
Vegetation clearing, Topsoil removal and stockpiling,	Soil compaction and contamination	Soils	Construction, Operational, Decommissioning and Closure	• Control through the appropriate stripping and stockpiling measures. • Control through the implementation of a Stormwater Management Plan.	• Compliance with the Mitigation measures provided in the BAR.	
Vegetation clearing, Topsoil removal and stockpiling, excavations	Loss of land use and land capability	Land capability and transformation of land	Operational, Construction	• Implementation and management through a rehabilitation and closure plan.	• Compliance with the Mitigation measures provided in the BAR	
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	Pollution of surface water resources	Surface water resources	Construction, Operational; Decommissioning and Closure	• Control through the implementation of a stormwater management plan. • Implementation and management through a rehabilitation and closure plan.	Rehabilitation standards/end use objectives	

ACTIVITY (whether listed or not listed). **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.).**	**POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)**	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated **(e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)**	**MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. Modify through alternative method. Control through noise control Control through management and monitoring Remedy through rehabilitation.**	**STANDARD TO BE ACHIEVED (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.**	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-. Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
Vegetation Clearing, removal of topsoil and stockpiling,	Pollution of groundwater resources	Groundwater resources	Operational, Construction,	• Control through the implementation of a stormwater management plan. • Implementation and management through a rehabilitation and closure plan.	Rehabilitation standards/end use objectives	
Vegetation Clearing, Excavations, Construction of infrastructure	Increase in nuisance dust	Air Quality	Construction, Operational, Decommissioning and Closure	• Control through frequent dust suppression. • Control through dust monitoring and recording.	Dust suppression controls National Dust Control Regulations (GNR 827 of November 2013)	
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	Increase in ambient noise levels	Noise receptors	Decommissioning and Closure	• Noise Control through the maintenance of vehicles and equipment.	Noise standard requirements of the Occupational Health and Safety Act (No. 85 of 1993) SANS 10103	
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	Increase in traffic on the local road networks to due haulage;	Traffic	Construction, Operational, Decommissioning and Closure	• Control through the implementation of a traffic management plan. • Implementation of a traffic complaints procedure.	Traffic Management Plan	
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	Visual Intrusion	Visual and aesthetic	Construction, Operational, Decommissioning and Closure	• Control visual intrusion by screening where possible. Implementation and management through a rehabilitation and closure plan.	Contractor method statement to control and management visual intrusion	
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	Unearthing of underground heritage and archaeological artefacts	Heritage and cultural resources	Operational, Construction; Decommissioning and Closure	• Prevent through the reporting and evaluation of any archaeological heritage resource found on site.	Rehabilitation standards/end use objectives	
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	Unearthing of underground heritage and archaeological artefacts	Palaeontological Impacts	Operational, Construction; Decommissioning and Closure	• Prevent through the reporting and evaluation of any palaeontological resource found on site.	Rehabilitation standards/end use objectives	
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	Population influx due to job seekers to the area which could pose a number of risks to the local community. Proposed development would create a number of local employment and business opportunities during construction.	Socio-Economic	Construction, Operational, Decommissioning and Closure	• Control through the implementation of a traffic management plan. • Implementation of a traffic complaints procedure. • Control through the recruitment process is conducted through the community structures established for the contract.	Rehabilitation standards/end use objectives	
Vegetation clearing, Excavations, demolition and/or removal of temporary infrastructure	Increase in waste	Waste Generation	Construction; Operational, Decommissioning and Closure	• Control through implementation of a waste management plan.	Waste Management Plan	

f) Impact Management Actions

(A description of impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (c) and (d) will be achieved).

ACTIVITY whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.).	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. □ Modify through alternative method. □ Control through noise control □ Control through management and monitoring Remedy through rehabilitation.	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-. Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
All of the above requirements are addressed in **Section e.**				

i) Financial Provision

(1) Determination of the amount of Financial Provision.

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

The objectives for closure have been discussed in Section d (1). However, the most critical objective is to ensure that the development footprint be shaped and rehabilitated in order to allow for the establishment of natural vegetation, and to facilitate the end land use identified.

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

Public participation for the proposed development has been undertaken. All comment received to date have been provided in Appendix E4. This BAR does include the closure objectives which has been made available to the public for review and comment.

(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.

The entire area utilised for the pipeline and service/maintenance road is limited to 4.9 ha. The following activities will take
place during the decommissioning phase:

- The removal of temporary structures and facilities.
- Removal and appropriate disposal of waste materials.
- Removal of bunded areas.
- Re-grading and resurfacing of the site.
- Re-planting; and
- Post rehabilitation monitoring.

In terms of the aerial extent of the rehabilitation**, Appendix C,** shows the site layout and aerial extent of the pipeline and service/maintenance road depicting the anticipated mining permit area at the time of closure.

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

The decommissioning phase will entail the rehabilitation of development footprint. Upon cessation of the construction activities, the area will be fully rehabilitated. The rehabilitation of the disturbed areas will comply with the minimum closure objectives as prescribed by DMRE and the activities as provided in **Part B Section d (i),** hence the rehabilitation plan (Appendix H) is considered to be compatible with the closure objectives identified for the site.

Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.

The quantum and calculations of the financial provisions required to be submitted by Harmony in terms of Regulation 53 of the MPRDA Act 28 of 2002 will be included in the FBAR submitted to the DMRE. A total quantum will be provided for rehabilitation and remediation of the environmental impacts for the development of the pipes and associated damage as well as close-out .

(e) Confirm that the financial provision will be provided as determined.

Refer to **Section i 1e above.**

Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including

g) Monitoring of Impact Management Actions
h) Monitoring and reporting frequency
i) Responsible persons
j) Time period for implementing impact management actions
k) Mechanism for monitoring compliance

Table 33: Mechanisms for Monitoring Compliance

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Vegetation clearing, Topsoil removal and stockpiling. Vehicle movement and construction of Infrastructure	Alien Invasive Plants	An Alien Invasive Species Control programme must be developed as per the Alien Invasive Species Management Plan (Appendix H) and implemented for all phases of the project.	ECO, Contractor	Monthly during the rehabilitation phase. Once rehabilitation work has been completed, invasive species monitoring, and eradication must continue biannually (every six months) for a period of two years.
	Soil Erosion	Management and monitoring of soil stockpiles. Soil must be stored properly and revegetated to prevent erosion and to enable re-use during rehabilitation.	ECO, Contractor	Monthly during the rehabilitation phase, and where encountered, immediate rectification must take place. Once such monitoring must continue biannually (every six months) for a period of two years.
	Dust	Regular dust suppression measures.	ECO, Contractor	Daily and Monthly monitoring
	Noise	Compliance with local by-laws and regulations regarding the generation of noise and hours of operation. Noise levels shall be monitored to comply with SANS 10103:2008 and Mine Health and Safety Act	ECO, Contractor	Daily monitoring
	Waste	Implementation of a Waste Management Plan	ECO, Contractor	Daily Monitoring

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

According to Regulations promulgated in terms of section 107(1) of the MPRDA (GNR 527 of 23 April 2004), Monitoring and Performance Assessments of an environmental management programme or environmental management plan are required. Regulation 55 of GNR 527 indicates that a performance assessment must be undertaken every two years during the active operations until decommissioning of the pipeline.

The Environmental Control Officer will undertake audits in compliance with the EMPr and will compile audit reports which will be submitted to the Applicant and the DMRE, unless otherwise stated by the DMRE in the Environmental Authorisation.

m) 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 Environmental Control Officer (ECO) and the Environmental Site Representative (ESR) will be responsible for ensuring that all site employees are given an environmental awareness induction prior to the commencement of site activities. The initial training will be undertaken by the ECO.

The environmental awareness training will aim to:

- Promote general environmental awareness as well as awareness specific to the project.
- Inform personnel about the availability and importance of adherence to the EMPr, Environmental Authorization as well as any other permits or licenses issued for the project.

The environmental awareness training programme will include:

- Induction of all personnel in a language and method most suitable.
- Signing of an attendance register and declaration of ensuring environmental protection.

Topics that will be included in the induction include:

- What is the environment and why must it be protected?
- What are the environmental sensitivities of the area in which activities are being undertaken?
- How construction activities can adversely impact of the environment;
- What are the mitigation measures for adverse impacts?
- What is the social responsibility of all site employees during construction?
- How should environmental incidents be recorded?

All new employees will be inducted by the ESR prior to commencing with work on site. Proof of the induction will be kept. Refresher environmental awareness training will be conducted by the ESR as and when the need arises. An example of this is when there is repeated non-compliances. The ESR will ensure daily toolbox talks include alerting the workforce to particular environmental concerns associated with the tasks for that day or the area / habitat in which they are working, etc. Awareness posters and pamphlets must be provided to create environmental awareness throughout the site.

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

All potential risks will be managed and potential environmental impacts prevented or minimised through the implementation of mitigation measures and the EMP. The mitigation measures are provided in the EMPr in Appendix H. The appropriate implementation of the EMP would be monitored through regular environmental monitoring by the appointed Environmental Control Officer.

n) Specific information required by the Competent Authority

(Among others, confirm that the financial provision will be reviewed annually).

A pre-application meeting with the DMRE was held on the 7th of September 2022. The DMRE advised that the application must be submitted as an amendment to Mining Right 226 where the majority of impacts associated with the construction of the pipeline will be located. A motivation was to be include to allow for the connecting pipes located on MR225 to be included in one application.

2) UNDERTAKING

The EAP herewith confirms

a) the correctness of the information provided in the reports [X]

b) the inclusion of comments and inputs from stakeholders and I&APs [X]

c) the inclusion of inputs and recommendations from the specialist reports where relevant; and [X]

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. [X]

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Signature of the Environmental Assessment Practitioner:

GA Environment (Pty) Ltd

_____

Name of company:
14th November 2022

_____

Date:

-END-

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