



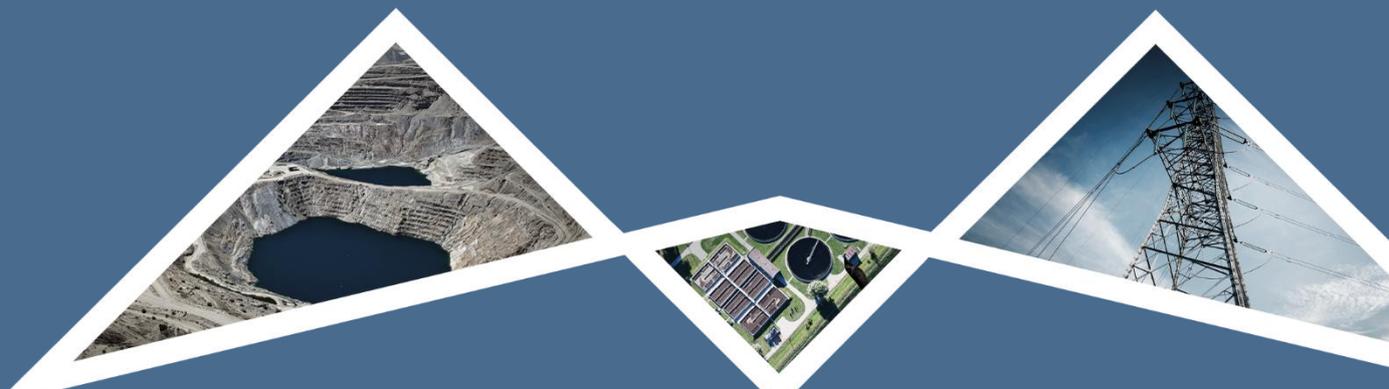
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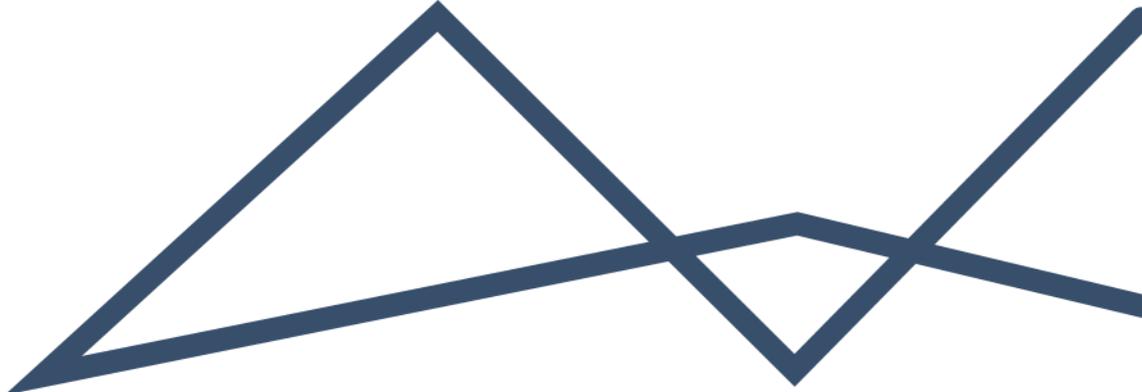
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BASIC ASSESSMENT REPORT

HARMONY ST HELENA 123 PIPELINE PROJECT

MAIN ASSOCIATED MINING RIGHT: ST HELENA (FS
30/5/1/2/2/85MR)





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ACRONYMS AND ABBREVIATIONS

AIP	Alien and Invasive Plant
amsl	above mean sea level
AQ	Air Quality
ASAPA	Association of Southern African Professional Archaeologists
BA	Basic Assessment
BAR	Basic Assessment Report
BGG	Burial Grounds and Graves
CBA	Critical Biodiversity Area
CI	Cumulative Impact
CMA	Catchment Management Agency
CMS	Catchment Management Strategy
CV	Curriculum Vitae
DFFE	Department of Forestry, Fisheries and the Environment
DMPR	Department of Mineral and Petroleum Resources
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECA	Environment Conservation Act
ECO	Environmental Control Officer



EIA	Environmental Impact Assessment
EIMS	Environmental Impact Management Services (Pty) Ltd
EMF	Environmental Management Framework
EMPr	Environmental Management Programme
FS	Final Significance
FS-SDF	Free State Spatial Development Framework
GN	Government Notice
HGM	Hydrogeomorphic unit
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IEM	Integrated Environmental Management
IRP	Integrated Resource Plan
KBA	Key Biodiversity Area
LED	Local Economic Development
LR	Loss of Resources
MHI	Major Hazard Installation
MPRDA	Mineral and Petroleum Resources Development Act
MR	Mining Right
NDP	National Development Plan
NEMA	National Environmental Management Act
NFEPA	National Freshwater Priority Area
NHRA	National Heritage Resources Act
NPAES	National Protected Areas Expansion Strategy
NT	Near Threatened
NWA	National Water Act
OHSA	Occupational Health and Safety Act
PCD	Pollution Control Dam
PF	Prioritisation Factor
PHRA	Provincial Heritage Resources Authority
PPP	Public Participation Process
RLE	Red List of Ecosystems
RWD	Return Water Dam
S&EIA	Scoping and Environmental Impact Assessment
SACAD	South African Conservation Areas Database
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System



SAPAD	South Africa Protected Areas Database
SCC	Species of Conservation Concern
SEI	Site Ecological Importance
SMME	Small, Medium and Micro Enterprises
SSVR	Site Sensitivity Verification Report
SWSA	Strategic Water Source Area
TSF	Tailings Storage Facility
VU	Vulnerable
WMA	Water Management Area
WULA	Water Use Licence Application
WWW	World Wide Web
ZoR	Zone of Regulation



EXECUTIVE SUMMARY

1.1 INTRODUCTION AND OVERVIEW

Harmony Mining Company Ltd, hereafter referred to as the Applicant, has appointed Environmental Impact Management Services (Pty) Ltd (EIMS) as the Environmental Assessment Practitioner (EAP) to assist with undertaking the required environmental authorisation processes (including the statutory public participation), and to compile and submit the required documentation in support of an application for:

- Environmental Authorisation (EA) in accordance with the National Environmental Management Act (NEMA- Act 107 of 1998)- Listed activities:
 - Listing Notice 1: Activities 10, 19 and 21D.
 - Listing Notice 3: Activity 14.
- Water Use Licence (WUL) in accordance with the National Water Act (NWA- Act 36 of 1998) - Listed Water Uses:
 - Section 21(c) (impeding or diverting the flow of water in a watercourse) and
 - Section 21(i) (altering the bed, banks, course or characteristics of a watercourse)

1.2 REGULATORY FRAMEWORK AND PROCESS

The main aim of the National Environmental Management Act, 1998 (Act 107 of 1998 – NEMA) is to provide for co-operative governance by establishing decision-making principles on matters affecting the environment. In terms of the NEMA EIA Regulations, the applicant is required to appoint an EAP to undertake the EIA process, as well as conduct the public participation process towards an application for EA.

On 21 April 2006, the Minister of Environmental Affairs and Tourism (now Department of Forestry, Fisheries and the Environment – DFFE) promulgated regulations in terms of Chapter 5 of the NEMA. These regulations, in terms of the NEMA, were amended a number of times between 2010 and 2022. The NEMA EIA Regulations, 2014, as amended, are applicable to this project.

Other legislation and standards or guidelines considered in this application includes:

1. Mineral and Petroleum Resources Development Act (Act No. 28 of 2002 – MPRDA)
2. National Environmental Management Biodiversity Act (Act No. 10 of 2004 – NEMBA)
3. National Water Act (Act No. 36 of 1998)
4. National Heritage Resources Act (Act No. 25 of 1999 – NHRA)
5. Occupational Health and Safety Act (Act No. 85 of 1993 - OHSA)
6. Provincial and Municipal Planning tools

1.3 PROJECT OVERVIEW

The Applicant is planning to construct a new return water pipeline between the St Helena 123 Tailings Storage Facility (TSF) Return Water Dam (RWD) and Dam 13, and in future will integrate with the low-pressure water system forming part of the Free State Reclamation Programme (specifically the proposed Nooitgedacht TSF project). The pipeline will have the following specifications:

- Length: approximately 11.4 km
- Diameter: 650 Nominal Bore (NB) with 4.5 mm wall thickness
- Flanged steel pipe manufactured to SANS 719 standards



- Installed above-ground on prefabricated concrete plinths
- Design flow rate: 1,583 m³/hr (439 l/s)

The pipeline will follow a similar corridor proposed for the approved FSN1 Pipeline Project, thereby minimising additional environmental disturbance. The pipeline will be installed above-ground on pre-cast concrete plinths. The project area is located on Farm portions, Klippan 14 (Portion 2), Stuirmanspan 92 (Remaining Extent and Portion 1), Marmegeli 20 (Remaining Extent), and St Helena 42 (Portions 1, 2, 3, 4, 5, and 6) within the Matjhabeng Local Municipality, in the Lejweleputswa District Municipality, in the Free State Province.

The activity falls within and supports water-management functions associated with the following affected Mining Right Areas:

1. St Helena (MR85) - FS 30/5/1/2/2/85MR
2. Harmony, Virginia, Merriespruit, Unisel, Brand, Saaiplaas & Masimong (MR82) - FS 30/5/1/2/2/82MR
3. Bambanani (MR83) - FS 30/5/1/2/2/83MR

1.4 RECEIVING ENVIRONMENT

The following is a summary of the receiving environment and baseline environmental attributes.

1.4.1 PHYSICAL ENVIRONMENT

The project area is situated within a gently undulating landscape characterised by elevations between approximately 1 330 and 1 370 m above sea level and slopes of less than 3%, creating a low-energy surface environment.

The broader setting comprises Vaal-Vet Sandy Grassland, a vegetation type typically dominated by *Themeda triandra*, with large portions of the insitu landscape already disturbed by historic and ongoing mining activities.

Soils in the area range from recharge-dominant to interflow-dominant groups, forming predictable hillslope patterns.

The hydrological environment consists primarily of non-perennial drainage features, pans, and depressions, with six mapped wetlands occurring within 500 m of the pipeline route, although none fall directly within the development footprint. Overall, the physical environment reflects a highly transformed mining landscape interspersed with remnant grassland and localised water-related features.

1.4.2 BIOLOGICAL ENVIRONMENT

The biological environment along the proposed pipeline route is characterised by highly disturbed terrestrial habitats, shaped largely by historic and ongoing mining activities. The area comprises a mosaic of Degraded Grassland, Degraded Secondary Grassland, Modified habitat, and artificial water-related features, with natural vegetation remaining only as fragmented patches of Vaal-Vet Sandy Grassland.

These habitats support mostly common and disturbance-tolerant flora and fauna, with no plant Species of Conservation Concern expected and only two fauna SCC flagged by the national Screening Tool, both assessed as having low likelihood of occurrence due to extensive habitat disturbance.

The broader area includes six regulated depression wetlands and a single low-sensitivity drainage feature, all of which lie outside the direct development footprint, and provide limited ecological functionality due to their degraded condition.

1.4.3 SOCIAL AND CULTURAL ENVIRONMENT

The project area is located within a highly transformed mining landscape south-west of Welkom, where land use is dominated by historical and active mining operations, associated infrastructure, and settlement patterns shaped by decades of gold production.



The surrounding communities of Welkom, Virginia, and Merriespruit form part of the broader Matjhabeng municipal area, characterised by a mixed urban-industrial setting with established road networks, public services, and mining-dependent economies.

Demographically, the region reflects the cultural diversity typical of the Free State, with communities shaped by long-standing social, economic, and labour ties to the mining sector. The cultural landscape includes a deep historical context, from early farming and Voortrekker settlement to South African War movements and the development of the Free State Goldfields, although no significant cultural heritage features occur within the project footprint due to the extensive disturbance of the area.

1.5 PUBLIC PARTICIPATION

The Public Participation Process (PPP) is designed to provide sufficient and accessible information to Interested and Affected Parties (I&APs) in an objective manner to assist them to:

- During the Environmental Authorisation:
- Verify that their issues have been recorded;
- Comment on the findings of the environmental assessments; and
- Provide relevant local information and knowledge to the environmental assessment.

The PPP is a requirement of several pieces of South African Legislation and aims to ensure that all relevant I&APs are consulted, involved and their opinions are taken into account and a record included in the reports submitted to Authorities. The process ensures that all stakeholders are provided this opportunity as part of a transparent process which allows for a robust and comprehensive environmental study. The PPP of this application commenced on the 15th January 2026.

Notification letters (in English, Afrikaans and Sesotho) were distributed to pre-identified I&APs through either faxes, SMSs, registered mail, and/or emails on the 5th February 2026.

Advertisements (in English and Afrikaans) describing the proposed project and Environmental Impact Assessment (EIA) process were placed in the Welkom Vista newspaper with circulation in the vicinity of the study area on 15th January 2026. Ten (10) A1 Correx site notices (in English, Afrikaans and Sesotho) were placed at 10 locations around the proposed project study area on 5th February 2026.

Comments on the proposed project were solicited from pre-identified and registered I&APs and key stakeholders. To date, the following comments have been received:

- I&AP registration.
- South African Civil Aviation Authority: Expressed that they had no further comment on the project.
- South African Heritage Resources Agency: Request for submission of SAHRIS Application
- Transnet: Request for locality information

1.6 IMPACT ASSESSMENT AND MITIGATION

Together with the input and observations of the EAP, several specialist studies have been commissioned to investigate key issues and impacts. Specialist studies conducted to inform this BA process include:

- Terrestrial Ecology;
- Wetland and Aquatic Ecology;
- Hydropedology
- Hydrology



- Heritage; and
- Palaeontology

A list of biophysical and social impacts have been identified and assessed during this BA process, as well as the pre-mitigation and post-mitigation environmental risk, and final significance when applying a priority factor is presented below. This list is representative of the preferred alternative identified in the alternative analysis of this report. A summary of identified impacts and significance of the proposed activities assessed in this BA process is present in the table below.



ID	Discipline	Impact	Phase	Pre-mitigation Significance	Post-mitigation Significance	Final Significance
AQ1	Climate and Air Quality	Minimal generation of dust and vehicle emissions from leveling of ground, and vehicle movement	Construction	Low -	Low -	Low -
AQ2	Climate and Air Quality	Minimal generation of dust and emissions from vehicle movement during inspection and maintenance activities	Operation	Low -	Low -	Low -
G1	Geology and Soils	Soil Compaction and Erosion	Construction	Medium to low -	Low -	Low -
G2	Geology and Soils	Negligible pollution of soils through minor spills from equipment/vehicles on site	Construction	Low -	Low -	Low -
G3	Geology and Soils	Soil Compaction and Erosion	Operation	Medium to low -	Low -	#N/A
G4	Geology and Soils	Negligible pollution of soils through minor spills from equipment/vehicles on site	Operation	Low -	Low -	Low -
G5	Geology and Soils	Soil Compaction and Erosion	Decommissioning	Medium to low -	Low -	Low -
W1	Surface water / wetlands	Indirect loss, disturbance and degradation of wetlands	Construction	Medium to low -	Low -	Low -
W2	Surface water / wetlands	Increased bare surfaces, runoff and potential for erosion	Construction	Medium to low -	Low -	Low -
W3	Surface water / wetlands	Degradation of wetland vegetation and the introduction and spread of alien and invasive vegetation	Construction	Medium to low -	Low -	Low -
W4	Surface water / wetlands	Contamination of wetlands with hydrocarbons due to machinery leaks and other waste	Construction	Medium to low -	Low -	Low -
W5	Surface water / wetlands	Alteration of hydrological regime at drainage feature crossing	Construction	Medium to low -	Low -	Low -
W6	Surface water / wetlands	Increased dirty/processed water inputs nearby wetlands due to leakage	Operation	Medium to low -	Low -	Medium to low -



ID	Discipline	Impact	Phase	Pre-mitigation Significance	Post-mitigation Significance	Final Significance
W7	Surface water / wetlands	Degradation of wetland vegetation and proliferation of alien and invasive species	Decommissioning	Medium to low -	Low -	Low -
W8	Surface water / wetlands	Disruption of wetland soil profile, hydrological regime and increased sediment loads	Decommissioning	Medium to low -	Low -	Low -
N1	Noise	Generation of noise through construction activities	Construction	Medium to low -	Low -	Low -
N2	Noise	Generation of noise through increased traffic and movement along access route	Construction	Medium to low -	Low -	Low -
N3	Noise	Generation of noise through maintenance, inspections, and calibrations	Operation	Medium to low -	Low -	Low -
N4	Noise	Generation of noise through increased traffic and movement along access route	Operation	Medium to low -	Low -	Low -
N5	Noise	Generation of noise during decommissioning/dismantling/removal of pipeline from site	Decommissioning	Medium to low -	Low -	Low -
TE1	Terrestrial Ecology	Destruction, further loss and fragmentation of the of habitats, ecosystems and vegetation community	Construction	Medium to high -	Medium to low -	Medium to low -
TE2	Terrestrial Ecology	Introduction of alien and invasive species, especially plants	Construction	Medium to high -	Medium to low -	Medium to low -
TE3	Terrestrial Ecology	Displacement of faunal community due to habitat loss, direct mortalities and disturbance (road collisions, noise, dust, vibration and poaching)	Construction	Medium to high -	Medium to low -	Medium to low -
TE4	Terrestrial Ecology	Continued fragmentation and degradation of habitats and ecosystems	Operation	Medium to high -	Medium to low -	Medium to low -
TE5	Terrestrial Ecology	Potential leaks, discharges, pollutants from pipeline and machinery/storage leaching into the surrounding environment.	Operation	High -	Medium to low -	Medium to low -



ID	Discipline	Impact	Phase	Pre-mitigation Significance	Post-mitigation Significance	Final Significance
TE6	Terrestrial Ecology	Ongoing displacement and direct mortalities of faunal community (including SCC) due to disturbance (road collisions, noise, light, dust, vibration)	Operation	Medium to high -	Medium to low -	Medium to low -
TE7	Terrestrial Ecology	Destruction of vegetation, encroachment and displacement of the natural vegetation community and direct mortality of fauna.	Decommissioning	Medium to high -	Medium to low -	Medium to low -
S1	Social	Further development of community through industry growth	Operation	Medium to high +	Medium to high +	Medium to high +
S2	Social	Potential future job creation	Operation	Low +	Low +	Low +
C1	Cultural Heritage	Damage/destruction to unknown archaeological and heritage material	Construction	Low -	Low +	Low +
C2	Cultural Heritage	Palaeontology: Loss of Fossil Heritage	Construction	Medium to high -	Low -	Low -
E1	Economic	Economic growth through the sustaining and support of Free State mining activities	Operation	Medium to high +	Medium to high +	Medium to high +



1.7 ENVIRONMENTAL IMPACT STATEMENT

The findings of the assessment and associated specialist studies conclude that there are no environmental fatal flaws that should prevent the proposed project from proceeding, provided that the recommended mitigation and management measures are implemented. Based on the nature and extent of the proposed project, the local level of disturbance predicted as a result of the proposed activities, the findings of the specialist studies, and the understanding of the significance level of potential environmental impacts, it is the opinion of the project team and the EAP that the significance levels of the majority of identified negative impacts can generally be reduced to an acceptable level by implementing the recommended mitigation measures and the project should be authorised.



2 INTRODUCTION

Harmony Mining Company Ltd, hereafter referred to as the Applicant, has appointed Environmental Impact Management Services (Pty) Ltd (EIMS) as the Environmental Assessment Practitioner (EAP) to assist with undertaking the required environmental authorisation processes (including the statutory public participation), and to compile and submit the required documentation in support of an application for:

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 - Section 21(c) (impeding or diverting the flow of water in a watercourse) and
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- Installed above-ground on prefabricated concrete plinths.
- Design flow rate: 1,583 m³/hr (439 l/s).

The pipeline will follow a similar corridor proposed for the approved FSN1 Pipeline Project, thereby minimising additional environmental disturbance. The pipeline will be installed above-ground on pre-cast concrete plinths. The project area is located on Farm portions, Klippan 14 (Portion 2), Stuirmanspan 92 (Remaining Extent and Portion 1), Marmegeli 20 (Remaining Extent), and St Helena 42 (Portions 1, 2, 3, 4, 5, and 6) within the Matjhabeng Local Municipality, in the Lejweleputswa District Municipality, in the Free State Province.

2.1 REPORT STRUCTURE

This report has been compiled in accordance with the NEMA EIA Regulations, 2014, as amended. A summary of the report structure, and the specific sections that correspond to the applicable regulations, is provided in Table 1 below.



Table 1: Report structure

Environmental Regulation	Description – NEMA Regulation 982 (2014) as amended	Section in Report
Appendix 1 - 3(1)(a)	Details of – <ul style="list-style-type: none"> i. The Environmental Assessment Practitioner (EAP) who prepared the report; and ii. The expertise of the EAP, including a curriculum vitae; 	1.1
Appendix 1 - 3(1)(b)	The location of the activity. Including – <ul style="list-style-type: none"> i. The 21-digit Surveyor General code of each cadastral land parcel; ii. Where available, the physical address and farm name; iii. Where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties; 	3
Appendix 1 - 3(1)(c)	A plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is – <ul style="list-style-type: none"> i. A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or ii. On a land where the property has not been defined, the coordinates within which the activity is to be undertaken; 	3
Appendix 1 - 3(1)(d)	A description of the scope of the proposed activity, including – <ul style="list-style-type: none"> i. All listed and specified activities triggered and being applied for; and ii. A description of the associated structures and infrastructure related to the development; 	4
Appendix 1 - 3(1)(e)	A description of the policy and legislative context within which the development is proposed including- <ul style="list-style-type: none"> (1) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and 	5



Environmental Regulation	Description – NEMA Regulation 982 (2014) as amended	Section in Report
	(ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments	
Appendix 1 - 3(1)(f)	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	6
Appendix 1 - 3(1)(g)	A motivation for the preferred site, activity and technology alternative	7, 4 and 10
Appendix 1 - 3(1)(h)	<p>A full description of the process followed to reach the proposed preferred alternative within the site, including: –</p> <ul style="list-style-type: none"> i. Details of the development footprint alternatives considered; ii. Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; iii. A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; iv. The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; v. The impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts – <ul style="list-style-type: none"> a. Can be reversed; b. May cause irreplaceable loss or resources; and c. Can be avoided, managed or mitigated; vi. The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives; vii. Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; viii. The possible mitigation measures that could be applied and level of residual risk; 	7, 4, 8 and 10



Environmental Regulation	Description – NEMA Regulation 982 (2014) as amended	Section in Report
	<ul style="list-style-type: none"> ix. The outcome of the site selection matrix; x. If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and; xi. A concluding statement indicating the preferred alternatives, including preferred location of the activity. 	
Appendix 1 - 3(1)(i)	<p>A full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including –</p> <ul style="list-style-type: none"> 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; 	7, 4, 8 and 10
Appendix 1 - 3(1)(j)	<p>An assessment of each identified potentially significant impact and risk, including –</p> <ul style="list-style-type: none"> i. Cumulative impacts; ii. The nature, significance and consequences of the impact and risk; iii. The extent and duration of the impact and risk; iv. The probability of the impact and risk occurring; v. The degree to which the impact and risk can be reversed; vi. The degree to which the impact and risk may cause irreplaceable loss of resources; and vii. The degree to which the impact and risk can be mitigated; 	7, 4, 8 and 10
Appendix 1 - 3(1)(k)	<p>Where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;</p>	10 and 1
Appendix 1 - 3(1)(l)	<p>An environmental impact statement which contains –</p> <ul style="list-style-type: none"> i. A summary of the key findings of the environmental impact assessment; 	11.3



Environmental Regulation	Description – NEMA Regulation 982 (2014) as amended	Section in Report
	<ul style="list-style-type: none"> ii. A map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and iii. A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives; 	
Appendix 1 - 3(1)(m)	Based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management outcomes for the development for inclusion in the EMPr;	11.4
Appendix 1 - 3(1)(n)	Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	11.4
Appendix 1 - 3(1)(o)	A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;	12
Appendix 1 - 3(1)(p)	A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	11.3
Appendix 1 - 3(1)(q)	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised;	N/A
Appendix 1 - 3(1)(l)	An undertaking under oath or affirmation by the EAP in relation to – <ul style="list-style-type: none"> iv. The correctness of the information provided in the reports; v. The inclusion of comments and inputs from stakeholders and interested and affected parties; vi. The inclusion of inputs and recommendations from the specialist reports where relevant; and vii. Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties; 	13
Appendix 1 - 3(1)(t)	Any specific information that may be required by the competent authority; and	None
Appendix 1 - 3(1)(u)	Any other matters required in terms of section 24(4)(a) and (b) of the Act.	None



2.2 DETAILS OF THE EAP

EIMS has been appointed by Harmony Gold Mining Company Limited as the independent Environmental Assessment Practitioner (EAP) to prepare and submit the EA application, Basic Assessment Report, and undertaking a Public Participation Process (PPP). The contact details of the EIMS consultant and EAP who compiled this Report are as follows:

- Name: Lucien James (Consultant and Candidate EAP) and John von Mayer (Registered EAP)
- Tel No: + 27 11 789 7170
- Fax No: +27 86 571 9047
- E-mail address: sthelen@eims.co.za

In terms of Regulation 13 of the EIA Regulations, 2014, as amended, an independent EAP, must be appointed by the applicant to manage the application. EIMS is compliant with the definition of an EAP as defined in Regulations 1 and 13 of the EIA Regulations, as well as Section 1 of the NEMA. This includes, inter alia, the requirement that EIMS is:

- Objective and independent;
- Has expertise in conducting EIA's;
- Comply with the NEMA, the environmental regulations and all other applicable legislation;
- Considers all relevant factors relating to the application; and
- Provides full disclosure to the applicant and the relevant environmental authority.

EIMS is a private and independent environmental management-consulting firm that was founded in 1993. EIMS has in excess of 30 years' experience in conducting EIA's. Please refer to the EIMS website (www.eims.co.za) for further details of expertise and experience.

John von Mayer is a principal consultant at EIMS and has been involved in numerous large projects the past 17 years. He has experience in Project Management, small to large scale Environmental Impact Assessments, Environmental Auditing, Water Use Licensing, and Public Participation. He is a Registered Professional Natural Scientist (400336/11) with the South African Council Natural and Scientific Professions (SACNASP) as well as a registered Environmental Assessment Practitioners Association of south Africa (EAPASA) Environmental Practitioner (2019/1247).

Dr Lucien James is an Environmental Consultant and Archaeologist with experience in different fields across the Arts, Social Science, Natural Science, and academia in general. He has been employed by EIMS as an environmental consultant since March 2023 working on several projects under various roles. He is registered with EAPASA as a Candidate EAP (2023/6772). Lucien has obtained a BSc (Hons) in Geography, Archaeology and Environmental Studies (Archaeology-focused) and is accredited as a Professional Archaeologist with the Association of South African Professional Archaeologists (ASAPA). He holds a MSc in Geography having done research on phytoremediation and the mining industry. In 2024, he completed his Ph.D. through research with a focus on collaborative River Basin Management in South Africa. He has worked as a Teaching Assistant (TA) and researcher since 2018 and engages in academic work through publications and conferences. He has taught 1st year, 2nd year, 3rd year and Honour's Archaeology and Geography courses. His research has been funded by the National Research Foundation (NRF) and the Water Research Commission (WRC). He is also actively publishing new papers in international academic journals. He has presented his research at a national level through various conferences in South Africa and has participated in other conferences and workshops on Climate Change and Climate Change Adaptation. The Curriculum Vitae of the EAP and Candidate EAP responsible for the compilation of this Report are included in APPENDIX A.



3 DESCRIPTION OF THE PROJECT AREA

Table 2 indicates the details of the project area for the proposed project including details on the project location as well as the distance from the proposed project area to the nearest towns.

Table 2: Locality details

Project Area	The proposed pipeline will traverse Farms Klippan 14 Portion 2, Remaining Extent and Portion 1 of Stuirmanspan 92, Remaining Extent of Marmageli 20, Portions 1, 2, 3, 4, 5 and 6 of St Helena 42.
Application Area (ha)	The application area includes a return water pipeline of 11.4 kms (~1,14ha)
District Municipality	Lejweleputswa District Municipality
Local Municipalities	Matjhabeng Local Municipality

The locality of the proposed project is shown in **Figure 1**.

The activity falls within and supports water-management functions associated with the following affected Mining Right Areas:

1. St Helena (MR85) - FS 30/5/1/2/2/85MR
2. Harmony, Virginia, Merriespruit, Unisel, Brand, Saaiplaas & Masimong (MR82) - FS 30/5/1/2/2/82MR
3. Bambanani (MR83) - FS 30/5/1/2/2/83MR

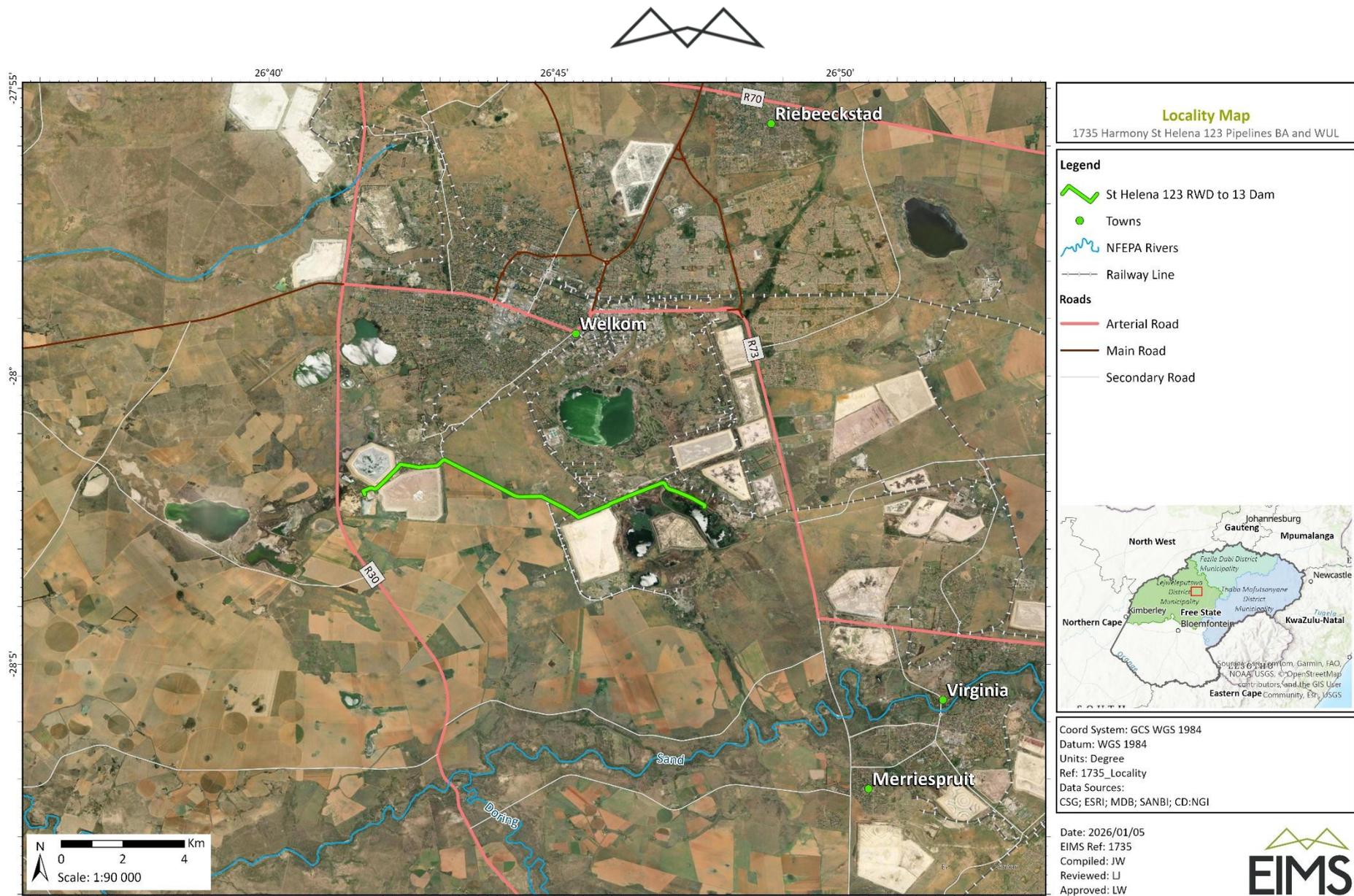


Figure 1: Locality map



4 DESCRIPTION AND SCOPE OF THE PROPOSED ACTIVITY

4.1 PROJECT DESCRIPTION

The project involves the construction and operation of a new return water pipeline linking the St Helena 123 Tailings Storage Facility (TSF) Return Water Dam to Dam 13. The proposed pipeline will be approximately 11.4 km in length and constructed as a 650 NB flanged steel pipeline, manufactured to SANS 719 standards, and installed above-ground on prefabricated concrete plinths. The system is designed to convey return water at a flow rate of 1,583 m³/hr and will follow an existing approved pipeline corridor wherever possible to minimise additional environmental disturbance.

The pipeline forms part of broader infrastructure required to support Harmony Gold Mining Company Ltd's operations and future integration into the Free State Reclamation Programme, including the proposed Nootgedacht TSF.

The activity falls within and supports water-management functions associated with the following affected Mining Right Areas:

1. St Helena (MR85) - FS 30/5/1/2/2/85MR
2. Harmony, Virginia, Merriespruit, Unisel, Brand, Saaiplaas & Masimong (MR82) - FS 30/5/1/2/2/82MR
3. Bambanani (MR83) - FS 30/5/1/2/2/83MR

4.1.1 PROJECT OVERVIEW

This section provides an overview of the project's components, and other details around associated activities and infrastructure, as well as human resources and labour.

4.1.2 PROJECT TIMELINE

The implementation of the proposed St Helena 123 Pipeline Project will follow a phased approach typical of pipeline construction processes undertaken by Harmony's Free State operations. This usually involves a (1) Planning and design phase, (2) Construction phase, (3) Commissioning and Operational phase, and (4) Decommissioning phase.

4.1.2.1 PLANNING AND DESIGN PHASE

The planning and design phase, anticipated to span approximately 12 to 18 months, will involve finalising the pipeline layout, securing the necessary permits and licenses including EA, and completing detailed engineering designs of the pipeline, plinths, and crossings and culverts. This phase will also include stakeholder engagement and, where necessary, landowner liaison to safeguard relations and minimise delays.

4.1.2.2 CONSTRUCTION PHASE

The construction phase is expected to take 6 to 12 months. The construction of the proposed pipeline follows a structured, phased process designed to minimise ground disturbance and ensure structural stability. Construction begins with transporting precast concrete plinths to the site. These plinths serve as the support foundations for the above-ground pipeline. Before installation, the precise locations for each plinth are surveyed and marked. Only the immediate footprint required for each plinth is cleared, and the ground surface is levelled to create a stable base. This targeted approach helps limit unnecessary vegetation removal and soil disturbance.

Once the plinth positions are prepared, the pipeline corridor is inspected to ensure it aligns correctly with the design profile. The use of precast supports allows the contractor to maintain a consistent elevation and alignment across the length of the pipeline, reducing the need for extensive excavation. Individual pipeline segments are delivered to site in manageable lengths. Each section is fitted with flanged ends, allowing the pipeline to be assembled piece-by-piece. During installation, segments are lifted into position onto the plinths, where the flanges are aligned and bolted together. Bolts are tightened in sequence using calibrated torque



equipment to ensure correct pressure and sealing integrity. This controlled assembly process ensures that the pipeline is structurally robust while reducing the likelihood of leaks or joint failures.

After the length of pipeline is assembled, the construction team performs alignment checks to verify that the pipeline follows the intended gradient and direction. Any necessary micro-adjustments are made on the plinths to ensure even load distribution and long-term stability. Additional inspections confirm that all flange connections meet engineering specifications prior to commissioning.

4.1.2.3 COMMISSIONING AND OPERATION PHASE

Once construction is complete, the pipeline undergoes a formal commissioning process to verify that it is safe, functional, and ready for operation. Commissioning typically includes a series of integrity and performance checks. The pipeline is first inspected along its full length to confirm that all flange connections, supports, and fittings have been correctly installed. This is followed by a pressure-testing phase (often using clean water) to ensure that the pipeline can withstand its designed operating pressure without leaks or structural weaknesses.

Instrumentation, valves, and any monitoring or control systems are then tested to confirm that they respond correctly under normal operating conditions. Once all tests meet the required engineering and safety standards, the pipeline is gradually introduced into service. Flow is increased in a controlled manner while operators monitor pressures, flows, and structural behaviour. After stable performance is confirmed, the pipeline enters full operational status.

4.1.2.4 DECOMMISSIONING PHASE

The decommissioning of the pipeline takes place once the infrastructure is no longer required or has reached the end of its operational life. Decommissioning is carried out in a controlled, phased manner to ensure environmental protection and site safety. The process begins with isolating the pipeline from all active systems and safely draining any remaining water or residues. The pipeline is then flushed to remove residual material and ensure that no contaminants remain.

Once cleaned, the pipeline is dismantled in sections by unbolting and removing the flanged connections. The steel components and fittings are transported off-site for reuse, recycling, or disposal at licensed facilities, depending on their condition. Concrete plinths may either be removed or left in place depending on landowner requirements, environmental considerations, and discussions with the competent authority.

After removal of infrastructure, the disturbed areas are rehabilitated. This typically includes backfilling and stabilising any compacted or disturbed surfaces, reinstating original drainage patterns, controlling erosion, and allowing natural vegetation to recover. Final rehabilitation is monitored to ensure the site is left in a stable, safe, and environmentally acceptable condition.

4.1.3 PROJECT COMPONENTS

The pipeline will have the following specifications:

- Length: approximately 11.4 km.
- Diameter: 650 NB with 4.5 mm wall thickness.
- Flanged steel pipe manufactured to SANS 719 standards.
- Installed above-ground on prefabricated concrete plinths.
- Design flow rate: 1,583 m³/hr (439 l/s).

The pipeline will be installed above-ground on pre-cast concrete plinths. The pipeline will follow a similar corridor proposed for the approved FSN1 Pipeline Project, thereby minimising additional environmental disturbance. Two additional tee-off points will also be installed as part of the pipeline, connecting the St Helena 4 RWD (through a pumpstation to be constructed) and Dam 12B pumpstation to the line.



4.1.4 ASSOCIATED ACTIVITIES AND INFRASTRUCTURE

This section highlights the associated activities and infrastructure which will be necessary during the construction and operation phases of the project.

4.1.4.1 ADMINISTRATION

The administration of the pipeline during both the construction and operational phases will be overseen by Harmony's Free State Regional Management Team. This team is responsible for overall project coordination, contractor management, compliance oversight, and ensuring that all construction and operational activities adhere to Harmony's internal engineering standards, safety protocols, and environmental management requirements.

During the construction phase, the regional management team will manage communication between engineering designers, construction contractors, landowners, and environmental personnel. Their responsibilities include monitoring construction progress, ensuring adherence to approved designs, verifying the correct installation of plinths and pipeline sections, and ensuring that environmental and safety measures such as restricted-footprint clearing, and proper waste handling are implemented on site.

During the operational phase, the applicant's Free State Regional Management Team will continue to administer the pipeline by overseeing routine inspections, maintenance activities, and system performance monitoring. This includes managing flow control infrastructure, responding to operational issues, coordinating repairs where necessary, and ensuring full compliance with the EA, WUL conditions, and Harmony's operational standards. They will also facilitate reporting, record-keeping, and communication with regulatory authorities where required.

4.1.4.2 POWER AND ELECTRICITY

During the construction phase, power supply will primarily rely on portable and temporary solutions to meet the energy demands of on-site activities. For instance, Diesel-powered or petrol-powered generators may be the main source of electricity for equipment and tools ensuring flexibility and mobility across the project footprint.

4.1.4.3 ROADS, TRAFFIC AND TRANSPORT

The proposed pipeline route follows existing Harmony Operations roads for the majority of its length, including both gravel and tarred sections. As a result, no new access roads will be required, and construction traffic will be confined to established routes. Along the alignment, the pipeline will intersect several internal roads. Instead of trenching beneath these roads, the design approach is to maintain the pipeline's designed elevation and construct engineered ramps over the pipeline at each crossing point. This method minimises ground disturbance, avoids extensive excavation within road servitudes, maintains safe and continuous vehicular movement, and reduces long-term maintenance requirements for both the pipeline and the existing road network.

4.1.4.4 WASTE MANAGEMENT

No dedicated laydown or storage areas are anticipated for the proposed pipeline construction, and as such no significant waste streams associated with bulk materials, site camps, or construction yards are expected. Minimal waste generation may occur from the use of hazardous materials, including small quantities of lubricants, sealants, and similar consumables, as well as packaging waste from equipment and pipeline components. All waste generated on site will be managed in accordance with Harmony's existing operational waste-handling procedures. This typically includes the removal of all waste from the construction footprint and transportation to Harmony Free State Operations' central waste management facilities for appropriate storage, recycling, or disposal, depending on the waste type. No waste will be buried, burned, or disposed of along the pipeline corridor, ensuring compliance with NEMWA and responsible environmental practice.



4.1.4.5 **WATER**

The proposed pipeline will be used exclusively for the transfer of return water associated with Harmony's Free State operations. Specifically, the system will convey return water from the St Helena 123 Return Water Dam and the St Helena 4 Return Water Dam to Dam 13, forming part of the broader water-management network that supports Harmony's Free State mining operations and integration into the reclamation programme. No slurry or process materials will be transported through this pipeline.

Along its alignment, the pipeline intersects the 500m Zone of Regulation (ZoR) of six wetlands or depressions. These intersections constitute water uses in terms of Section 21(c) (impeding or diverting flow in a watercourse) and Section 21(i) (altering the bed, banks, course, or characteristics of a watercourse) of the National Water Act 36 of 1998. Accordingly, these activities will be included and assessed within the Water Use Licence Application (WULA) for the project, ensuring full compliance with statutory water-resource protection requirements.

4.1.4.6 **SEWAGE AND WASTEWATER**

The proposed pipeline is not expected to generate meaningful quantities of wastewater during its construction or operational phases. No laydown areas, construction camps, or temporary worker facilities are planned for the project, and therefore no sewage infrastructure is required specifically for the pipeline. Clean water will be used during the pipeline testing and commissioning process; however, this volume is expected to be minimal and will not result in significant wastewater generation. Sanitation needs for construction personnel will be met through the use of existing Harmony operational ablution facilities, located in close proximity to the pipeline corridor. This approach avoids the need for temporary sanitation units and ensures that wastewater continues to be managed through Harmony's established systems in line with site-wide environmental management practices.

4.1.4.7 **STORMWATER MANAGEMENT**

The proposed pipeline will be installed above-ground on prefabricated concrete plinths, a design feature that inherently minimises disturbance to natural drainage lines and significantly reduces the likelihood of altering stormwater flow patterns. The hydrological assessment confirms that the plinths represent only a negligible increase in hardstanding area, meaning changes to catchment runoff behaviour are expected to be minimal and potentially immeasurable.

To manage these risks and ensure regulatory compliance, Stormwater will be managed as stipulated in the EMPr. The hydrology report notes that a pipeline-specific stormwater management plan is not required for the pipeline itself, given that it is sealed and designed not to spill more than once in 50 years.

4.1.4.8 **SECURITY**

The proposed pipeline route is located entirely within Harmony Gold Mining Company Limited's operational area, where access is controlled in accordance with the company's established security protocols. Harmony maintains a comprehensive security framework across its Free State operations, including controlled entry points, routine patrols, and regular monitoring of operational areas. As such, the project benefits directly from the existing security infrastructure and governance systems already in place.

4.1.4.9 **NATURAL RESOURCE USE AND REQUIREMENTS**

The proposed pipeline will have a limited interaction with natural resources, given its linear footprint, above-ground design, and location crossing majority Harmony-owned mining properties. The primary natural resources that will be affected or utilised during the construction and operational phases are land and water, with no significant use of other natural resources anticipated.

The pipeline will be used exclusively for the transfer of return water within Harmony's existing operational water management system. No freshwater abstraction, process water demand, or additional consumptive use of water is required for the construction or operation of the pipeline.



4.1.5 CLOSURE AND REHABILITATION

A DMR-compliant closure costing for the proposed pipeline has been completed by MineLock Environmental Engineers (March 2026) and is submitted as part of the financial provisioning requirements for this application. The report is attached as APPENDIX H of this report.

The DMR Guideline presents generally accepted closure methods, based on experience in the field, which have been used as the basis for determining the Master Rates for the various closure components in the “rules-based” approach. Where relevant, specific reference is made to the site conditions and requirements applicable to the closure of the pipeline project. In addition, the relevant mine structures and components requiring closure are listed.

The common method of valuation to determine the Master Rate for processing plants is that:

- All infrastructure and concrete buildings should be broken down to natural ground level and buried adjacent to the plant site,
- Foundations, structures and conveyors should be broken down to natural ground level,
- The areas are to be covered with 1,0m subsoil, topsoiled with 300mm of topsoil and vegetation established, or as noted in the relevant EMP,
- The monitoring and maintenance of these areas has been costed under the appropriate areas,
- The concrete hardstand is the area between the plant buildings,
- Top soiling and vegetation for the areas are included under general surface rehabilitation, and
- No credits are allowed for scrap steel and equipment that can be re-used or sold.

The quantum for financial provisions for scheduled closure was estimated using the rule-based approach defined in the DMR Guideline. Refer to APPENDIX H for summarised breakdown of the closure cost assessment.

4.1.6 HUMAN RESOURCES AND LABOUR

The proposed pipeline project is not expected to create any significant new labour demand beyond what is already available within Harmony’s existing operational structure. Pipeline installation will be undertaken over a relatively short construction timeframe and will largely be executed using Harmony’s internal engineering, maintenance, and operational teams, supported where necessary by small, specialised contractors for tasks such as lifting, welding, or transport.

Harmony’s Free State operations already maintain a stable workforce with the skills and experience required for projects of this nature, including fitters, boilermakers, welders, rigging personnel, safety officers, and general assistants. As such, no additional recruitment, training programmes, or external labour sourcing is anticipated. Existing staff will be reassigned as needed, ensuring continuity of employment and alignment with Harmony’s internal labour planning processes.



5 POLICY AND LEGISLATIVE CONTEXT

This section provides an overview of the governing legislation identified which relates to the proposed project.

5.1 NATIONAL LEGISLATION

5.1.1 CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA

The constitution of any country is the supreme law of that country. The Bill of Rights in chapter 2 section 24 of the Constitution of South Africa Act (Act No. 108 of 1996) makes provisions for environmental issues and declares that: *“Everyone has the right -*

- a) to an environment that is not harmful to their health or well-being; and*
- b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:
 - i. prevent pollution and ecological degradation;*
 - ii. promote conservation; and*
 - iii. secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development”.**

The EIA and associated impact mitigation actions are conducted to fulfil the requirement of the Bill of Rights.

5.1.2 MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT (MPRDA)

The aim of the MPRDA is to *“make provision for equitable access to and sustainable development of the nation’s mineral and petroleum resources”*. The MPRDA outlines the procedural requirements that need to be met to acquire mining rights in South Africa. The MPRDA also requires adherence with related legislation, chief amongst them is the National Environmental Management Act (Act No. 107 of 1998, NEMA) and the National Water Act (Act No. 36 of 1998, NWA).

The project supports and is part of the operations which take place in a

5.1.3 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NEMA)

The main aim of the National Environmental Management Act, 1998 (Act 107 of 1998 – NEMA) is to provide for co-operative governance by establishing decision-making principles on matters affecting the environment. In terms of the NEMA EIA Regulations, the applicant is required to appoint an EAP to undertake the EIA process, as well as conduct the public participation process towards an application for EA. In South Africa, EIA’s became a legal requirement in 1997 with the promulgation of regulations under the Environment Conservation Act (ECA). Subsequently, NEMA was passed in 1998. Section 24(2) of NEMA empowers the Minister and any MEC, with the concurrence of the Minister, to identify activities which must be considered, investigated, assessed and reported on to the competent authority responsible for granting the relevant EA. On 21 April 2006, the Minister of Environmental Affairs and Tourism (now Department of Forestry, Fisheries and the Environment – DFFE) promulgated regulations in terms of Chapter 5 of the NEMA. These regulations, in terms of the NEMA, were amended a number of times between 2010 and 2022. The NEMA EIA Regulations, 2014, as amended, are applicable to this project. Exploration and Production activities officially became governable under the NEMA EIA Regulations in December 2014 with the competent authority identified as the DMPR.

The objective of the EIA Regulations is to establish the procedures that must be followed in the consideration, investigation, assessment and reporting of the listed activities that are triggered by the proposed project. The purpose of these procedures is to provide the competent authority with adequate information to make informed decisions which ensure that activities which may impact negatively on the environment to an unacceptable degree are not authorised, and that activities which are authorised are undertaken in such a manner that the environmental impacts are managed to acceptable levels.

NEMA sets out the general objectives of IEM in South Africa, including to (section 23(2)), of which the following two are of relevance for this report:



- Identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities. This is to be done with a view to minimising negative impacts, maximising benefits and promoting compliance with the principles of environmental management set out in section 2 (of NEMA).
- Ensure that the effects of activities on the environment receive adequate consideration before actions are taken in connection with them.

5.1.3.1 LISTED ACTIVITIES

In accordance with the provisions of Sections 24(5) and Section 44 of the NEMA the Minister has published Regulations (GN R. 982) pertaining to the required process for conducting EIA's in order to apply for, and be considered for, the issuing of an EA. These EIA Regulations provide a detailed description of the process to be followed when applying for EA for any listed activity.

In terms of these regulations a Basic Assessment process is required for the proposed project. The Table 3 below identifies the listed activities the proposed project triggers and consequently requires authorisation prior to commencement.

Table 3: NEMA listed activities to be authorised

Activity	Activity Description	Applicability
GN R 983, Activity 10	The development and related operation of infrastructure exceeding 1 000 metres in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes- (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more; excluding where- (a) such infrastructure is for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes inside a road reserve or railway line reserve;	The project will involve the construction of a pipeline which is 11,4 km in length, with a diameter of 650NB.
GN R 983, Activity 19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;	The proposed pipeline will traverse the 500m Zones of Regulation of several identified depressions. As the pipeline will cross these areas, levelling of the ground for the placement of plinths will take place in the regulated areas. This activity, therefore, also triggers Section 21 of the National Water Act.
GN R 983, Activity 21D	Any activity including the operation of that activity which requires an amendment or variation to a right or permit in terms of 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.	The amending of the existing approved EMPr of the Mining Right(s) for the addition of the EMPr of the proposed infrastructure as an addendum.



Activity	Activity Description	Applicability
GN R 985, Activity 14	The development of- (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs- (a) within a watercourse;	As highlighted, the pipeline exceeds a footprint of 10 square metres, and will traverse the 500m zones of regulation of several depressions.

The DFFE have published a number of guidelines and protocols which have been considered in the compilation of this report and include but not limited to:

- Public Participation Guideline in terms of NEMA EIA Regulations (2017).
- Need and desirability Guideline in terms of NEMA (2012).
- National guideline on minimum information requirements for preparing Environmental Impact Assessments for mining act activities that require environmental authorisation (2018).
- 2004 Information Series covering various aspects of the EIA process.
- Procedures for assessment and minimum criteria for specialist studies.

5.1.3.2 SCREENING TOOL

A Screening Tool Report was generated from the DFFE Screening tool as per the requirements of Regulation 16 (1)(b)(v) of the EIA Regulations 2014, as amended, and was included in the Application for EA. The screening Tool provided a list of specialist studies for consideration and inclusion in the process. The Screening Tool identified environmental sensitivities are presented in Table 4.

Table 4: Screening Tool environmental sensitivities.

Theme	Sensitivity			
	Very High	High	Medium	Low
Agriculture Theme		X		
Animal species Theme			X	
Aquatic Biodiversity Theme				X
Archaeological and Cultural Heritage				X
Civil Aviation Theme		X		
Defence Theme				X
Palaeontology Theme			X	
Plant Species Theme				X
Terrestrial Biodiversity Theme	X			

In this regard, as Site Sensitivity Verification Report (SSVR) has been compiled to consider the recommendations of the DFFE Screening Tool Report and to provide a rationale for the selection of specialist studies included in the assessment report. Please refer to Table 5 for a summary of the verification process. Please refer to APPENDIX B for the SSVR.



Table 5: SSVR findings and motivation.

Screening identified specialist	Tool	Level of sensitivity	Suggested Sensitivity	Required level of assessment	Motivation
Agriculture Impact Assessment		High	Low	None	Agricultural land will be minimally, if not affected at all by the project activities. While rehabilitation activities have involved agriculture, majority of the land to be disturbed will include areas part of mining operations.
Archaeological and Cultural Heritage Impact Assessment		Low	Low	Desktop Study	A Desktop Heritage Impact Assessment is recommended given that the area has been previously studied and findings of these studies are available. Furthermore, the archaeological context of the site has been extensively disturbed with remnants of early mining activities presenting as the main heritage sensitivities where applicable.
Palaeontology Impact Assessment		Medium	Medium	Desktop Study	While the sensitivity of the area has been considered minimum, the project will not disturb the underlying geology of the site. However, a desktop assessment is recommended to consider any potential impacts.
Terrestrial Biodiversity Impact Assessment		Very High	Low	Compliance Statement	The screening tool suggests the sensitivity of the site to be Very High. This is mainly as the site intersects with CBA 1 and ESA 2, as sensitive biodiversity areas. However, upon site sensitivity verification, it was ascertained that the site is highly disturbed. As such, a compliance statement will be conducted.
Aquatic Biodiversity Impact Assessment		Low	Low	Full Study	The site does intersect with 500m wetland regulated areas. While these wetland areas are highly disturbed, a full study was conducted to identify and delineate any additional water resources affected by the project.
Geotechnical Assessment		N/A	N/A	Other	This assessment will be undertaken by the applicant as part of the



Screening identified specialist	Tool	Level of sensitivity	Suggested Sensitivity	Required level of assessment	Motivation
					engineering and planning of the project.
Plant Species Assessment	Species	Low	Low	Compliance Statement	The vegetation of the area is highly disturbed by the mining activities of the area. The sensitivity highlighted by the screening tool was verified. As such, plant species will be commented on as part of the terrestrial ecology compliance statement.
Animal Species Assessment	Species	Medium	Low	Compliance Statement	The fauna of the area is highly disturbed by the mining activities of the area. The sensitivity highlighted by the screening tool was verified. As such, animal species will be commented on as part of the terrestrial ecology compliance statement.
Seismicity Assessment		N/A	N/A	None	As the project will not have any seismic impact, no assessment will be undertaken.
Socio-economic Assessment		N/A	N/A	None	As majority of the project falls within mining areas and is not expected to create a significant amount of new job opportunities, it is anticipated that the project will have a minimal, if any, socio-economic impact. As such, no assessment will be undertaken. However, the public will be engaged through the Basic Assessment process through which any social and economic impacts will be identified and addressed.
Hydrology Assessment		N/A	N/A	Full Study	The pipeline will be constructed on the surface which may affect runoff. As such, a hydrology assessment as well as a hydrogeology compliance statement have been recommended.

5.1.4 NATIONAL ENVIRONMENTAL MANAGEMENT BIODIVERSITY ACT (NEMBA)

The National Environmental Management Biodiversity Act (Act No. 10 of 2004 – NEMBA) provides for the management and conservation of South Africa’s biodiversity within the framework of the NEMA as well as the protection of species and ecosystems that warrant national protection. Within the framework of this act, various



regulations are promulgated which provide specific requirements and management measures relating to protecting threatened ecosystems, threatened or protected species as well as the control of alien and invasive species. A summary of these regulations is presented below.

The National List of Ecosystems that are Threatened and Need of Protection (GN 1002 of 2011) are promulgated under the NEMBA and these Regulations provide for listing of threatened or protected ecosystems in one of the following categories:

- Critically Endangered (CR) ecosystems, being ecosystems that have undergone severe degradation of ecological structure, function or composition as a result of human intervention and are subject to an extremely high risk of irreversible transformation;
- Endangered (EN) ecosystems, being ecosystems that have undergone degradation of ecological structure, function or composition as a result of human intervention, although they are not critically endangered ecosystems;
- Vulnerable (VU) ecosystems, being ecosystems that have a high risk of undergoing significant degradation of ecological structure, function or composition as a result of human intervention, although they are not critically endangered ecosystems or endangered ecosystems; and
- Protected ecosystems, being ecosystems that are of high conservation value or of high national or provincial importance, although they are not listed as critically endangered, endangered or vulnerable.

Further regulations published under the NEMBA are the threatened or protected Species Regulations (GN R 152 OF 2007) which aims to:

- (a) further regulate the permit system set out in Chapter 7 of the Biodiversity Act insofar as that system applies to restricted activities involving specimens of listed threatened or protected species;
- (b) provide for the registration of captive breeding operations, commercial exhibition facilities, game farms, nurseries, scientific institutions, sanctuaries and rehabilitation facilities and wildlife traders;
- (c) provide for the regulation of the carrying out of a specific restricted activity, namely hunting;
- (d) provide for the prohibition of specific restricted activities involving specific listed threatened or protected species;
- (e) provide for the protection of wild populations of listed threatened species; and
- (f) provide for the composition and operating procedure of the Scientific Authority.

The Alien and Invasive Species Lists are promulgated under the NEMBA with the aim of protecting the quality and quantity of arable land in South Africa. Loss of arable land should be avoided and declared Weeds and Invaders in South Africa are categorised according to one of the following categories, and require control or removal:

- Category 1a Listed Invasive Species: Category 1a Listed Invasive Species are those species listed as such by notice in terms of section 70(1)(a) of the Act as species which must be combated or eradicated;
- Category 1b Listed Invasive Species: Category 1b Listed Invasive Species are those species listed as such by notice in terms of section 70(1)(a) of the Act as species which must be controlled;
- Category 2 Listed Invasive Species: Category 2 Listed Invasive Species are those species listed by notice in terms of section 70(1)(a) of the Act as species which require a permit to carry out a restricted activity within an area specified in the Notice or an area specified in the permit, as the case may be; and
- Category 3 Listed Invasive Species: Category 3 Listed Invasive Species are species that are listed by notice in terms of section 70(1)(a) of the Act, as species which are subject to exemptions in terms of section 71(3) and prohibitions in terms of section 71A of Act, as specified in the Notice.



In giving effect to the above, the Alien and Invasive Species Regulations (GNR 1020 of 2020) provide for amongst others, the prevention of the spread or allowing the spread of, any specimen of a listed invasive species.

The project footprint intersects with a Critical Biodiversity Area (CBA) and an Ecological Support Area (ESA). CBAs and ESAs are identified in Biodiversity Sector Plans, Bioregional Plans, and provincial conservation assessments. These plans are recognised under NEMBA as official biodiversity planning tools.

Under the National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA), development activities that occur within areas formally identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) carry specific implications related to biodiversity protection, land-use planning, and environmental authorisation.

While NEMBA itself does not prohibit development in CBAs or ESAs, it establishes the legal framework for the protection of species and ecosystems, and therefore requires that any environmental assessment must demonstrate that biodiversity impacts are avoided, minimised, or remedied in line with biodiversity-inclusive planning tools.

5.1.5 THE NATIONAL WATER ACT (NWA)

The purpose of the NWA is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways which take into account amongst other factors:

- a) meeting the basic human needs of present and future generations;
- b) promoting equitable access to water;
- c) redressing the results of past racial and gender discrimination;
- d) promoting the efficient, sustainable and beneficial use of water in the public interest;
- e) facilitating social and economic development;
- f) providing for growing demand for water use;
- g) protecting aquatic and associated ecosystems and their biological diversity;
- h) reducing and preventing pollution and degradation of water resources;
- i) meeting international obligations;
- j) promoting dam safety;
- k) managing floods and droughts,

and for achieving this purpose, to establish suitable institutions and to ensure that they have appropriate community, racial and gender representation.

The NWA makes provision for two types of applications for water use licences, namely individual applications and compulsory applications. The NWA also provides that the responsible authority may require an assessment by the applicant of the likely effect of the proposed licence on the resource quality, and that such assessment be subject to the NEMA EIA Regulations. A person may use water if the use is –

- Permissible as a continuation of an existing lawful water use (ELWU);
- Permissible in terms of a general authorisation (GA);
- Permissible under Schedule 1; or
- Authorised by a licence.

The above water use processes are described in Figure 2.

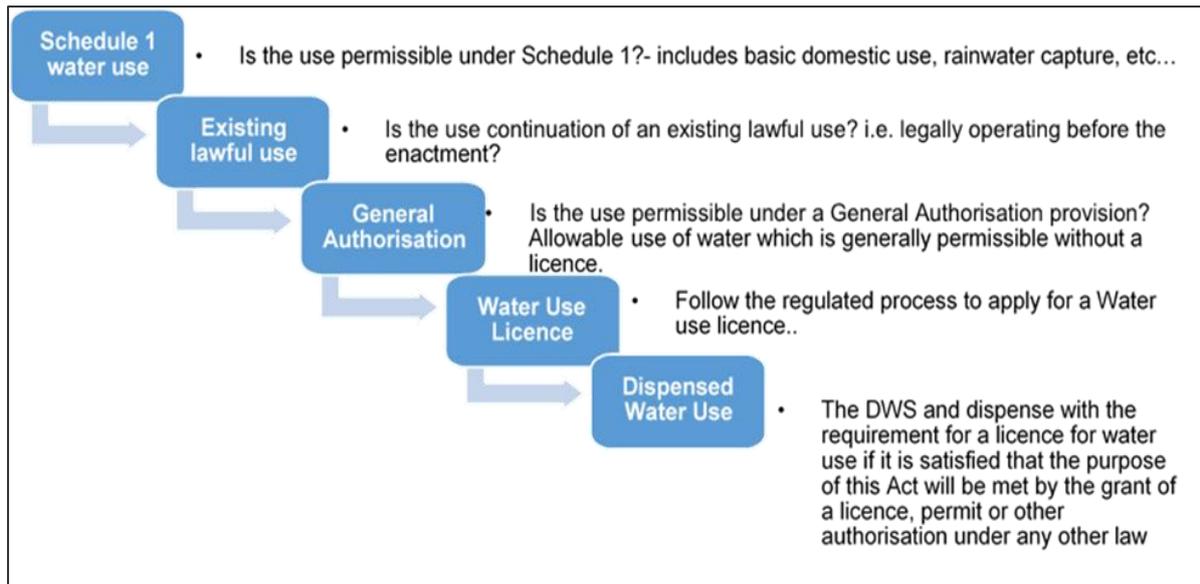


Figure 2: Authorisation processes for new water uses.

The NWA defines 11 water uses in Section 21 of the Act. A water use may only be undertaken if authorised by the DWS. The water uses for which an authorisation or licence can be issued include:

- a) Taking water from a water resource;
- b) Storing water;
- c) Impeding or diverting the flow of water in a watercourse;
- d) Engaging in a stream flow reduction activity contemplated in section 36;
- e) Engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);
- f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduits;
- g) Disposing of waste in a manner which may detrimentally impact on a water resource;
- h) Disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;
- i) Altering the bed, banks, course or characteristics of a watercourse;
- j) Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and
- k) Using water for recreational purposes.

A watercourse is defined in terms of the Act as follows:

- 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;

The regulated area of a watercourse for section 21(c) or (i) of the Act water uses, is similarly defined in terms of the Act as follows:



- a) The outer edge of the 1 in 100-year flood line and/or delineated riparian habitat, whichever is the greatest distance, measured from the middle of the watercourse of a river, spring, natural channel, lake or dam;
- b) In the absence of a determined 1 in 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); or
- c) A 500 m radius from the delineated boundary (extent) of any wetland or pan.

As part of this EA process, the relevant water uses will be identified and applied for. The water uses applicable to this project are presented in Table 6 below and shall be discussed and agreed upon with the DWS during the WULA process.

Table 6: Likely NWA Section 21 water uses triggered by this project.

Section water use	21 Description	Applicability
c & i	Impeding or diverting the flow of water in a watercourse and/or altering the bed, banks, course or characteristics of a watercourse.	The pipeline crosses through the zones of regulation of 6 depressions which are not interconnected. As such, Section 21 (c) and (i) are applicable.

The required water use licencing application will run concurrently with this EIA process and in consultation with the DWS, additional water uses may be identified.

South Africa is divided into nineteen Water Management Areas (WMAs). The delegation of water resource management from central government to catchment level is achieved by establishing Catchment Management Agencies (CMAs) at WMA level. Each CMA progressively develops a Catchment Management Strategy (CMS) for the protection, use, development, conservation, management and control of water resources within its WMA. This is to ensure that on a regional scale, water is protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner for the benefit of all persons. The main instrument that guides and governs the activities of a WMA is the CMS which, while conforming to relevant legislation and national strategies, provides detailed arrangements for the protection, use, development, conservation, management and control of the region's water resources.

The pipeline is located in the Vaal-Orange Water Management Area (WMA), and in the C42J and C43B quaternary catchments. The WMA is managed by the Vaal-Orange Catchment Management Agency (VOCMA). VOCMA is actively developing a CMS for the WMA which will aid in the management of water resources.

5.1.6 NATIONAL HERITAGE RESOURCES ACT (NHRA)

The National Heritage Resources Act (Act 25 of 1999 – NHRA) stipulates that cultural heritage resources may not be disturbed without authorisation from the relevant heritage authority. Section 34(1) of the NHRA states that, *“no person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority...”* The NHRA is utilised as the basis for the identification, evaluation and management of heritage resources and in the case of Cultural Resource Management (CRM) those resources specifically impacted on by development as stipulated in Section 38 of NHRA, and those developments administered through the NEMA, MPRDA and the Development Facilitation Act (FDA) legislation. In the latter cases the feedback from the relevant heritage resources authority is required by the State and Provincial Departments managing these Acts before any authorisations are granted for a development. The last few years have seen a significant change towards the inclusion of heritage assessments as a major component of Environmental Impact Processes required by the NEMA and MPRDA.

The NEMA 23(2)(b) gives effect to the NHRA and states that an integrated environmental management plan should, *“...identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage”*. A study of subsections (23)(2)(d), (29)(1)(d), (32)(2)(d) and (34)(b) and their



requirements reveals the compulsory inclusion of the identification of cultural resources, the evaluation of the impacts of the proposed activity on these resources, the identification of alternatives and the management procedures for such cultural resources for each of the documents noted in the Environmental Regulations. A further important aspect to be taken into account of in the EIA Regulations under the NEMA relates to the Specialist Report requirements (Appendix 6 of EIA Regulations 2014, as amended) which apply to Heritage Impact Assessments.

The MPRDA also gives effect to the NHRA as this Act defines ‘environment’ as it is in the NEMA and, therefore, acknowledges cultural resources as part of the environment. Section 39(3)(b) of this Act specifically refers to the evaluation, assessment and identification of impacts on all heritage resources as identified in Section 3(2) of the NHRA that are to be impacted on by activities governed by the MPRDA. Section 40 of the MPRDA requires the consultation with any State Department administering any law that has relevance on such an application through Section 39 of the MPRDA. This implies the evaluation of Heritage Assessment Reports in Environmental Management Plans or Programmes by the relevant heritage authorities.

In accordance with the legislative requirements and EIA rating criteria, the regulations of the South African Heritage Resources Agency (SAHRA) and Association of Southern African Professional Archaeologists (ASAPA) have also been incorporated to ensure that a comprehensive and legally compatible Heritage Report is compiled.

A Desktop Heritage Impact Assessment was undertaken as part of the EA application for the FSN 1 Pipeline project which runs along a large section (about 8 km) of the project area. According to the DFFE Screening Tool and data from the SAHRA register of heritage features, the areas is of Low heritage sensitivity. A Desktop Heritage Impact Assessment was undertaken to verify the sensitivity of the area and identify any additional heritage features along the remaining ~3 km section.

5.1.7 OCCUPATIONAL HEALTH AND SAFETY ACT

The Occupational Health and Safety Act (Act 85 of 1993 - OHS Act) provides for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work; to establish an advisory council for occupational health and safety; and to provide for matters connected therewith. Worker safety will form part of the contractor’s safety requirements and be guided by the OHS Act. This would entail a full health and safety file including but not limited to pre-mobilization medical assessments, work environment and task specific risk assessments and method statements etc. The project will be required to comply with the OHS Act and or Mine Health and Safety Act (dependent on the specific aspect of the production operations). Therefore safety of all personnel will be guided by overarching South African legislation.

The Major Hazard Installation Regulations (GNR 692 of 30 July 2001) are promulgated under the OHS Act and apply to employers, self-employed persons and users, who have on their premises, either permanently or temporarily, a major hazard installation or a quantity of a substance which may pose a risk that could affect the health and safety of employees and the public.

A “major hazard installation” means an installation-

- a) where more than the prescribed quantity of any substance is or may be kept, whether permanently or temporarily; or
- b) where any substance is produced, processed, used, handled or stored in such a form and quantity that it has the potential to cause a major incident.

This project does not include a MHI, and therefore does not trigger the Major Hazard Installation Regulations.

5.2 NATIONAL POLICY AND PLANNING CONTEXT

The proposed St Helena 123 Pipeline Project aligns with several key national policy frameworks that guide South Africa’s long-term development, infrastructure planning, environmental management, and resource



governance. These frameworks provide the strategic context within which the project must be assessed and authorised.

5.2.1 NATIONAL DEVELOPMENT PLAN (NDP) 2030

The National Development Plan (NDP) serves as South Africa's overarching long-term development strategy. It promotes inclusive economic growth, improved infrastructure networks, environmental sustainability, and stronger institutional capacity. The NDP emphasises the need for well-maintained and strategically planned economic infrastructure, including water-management systems, in order to support national development outcomes such as job creation, spatial transformation, and resilience to climate risks.

The NDP specifically highlights the importance of strengthening water-sector investment, improving infrastructure management, and modernising priority economic infrastructure systems such as energy, transport, and water services. Further, the NDP positions infrastructure expansion and maintenance as critical to achieving national goals of inclusive economic growth, an efficient state, and sustainable resource use.

5.3 PROVINCIAL POLICY AND PLANNING CONTEXT

The proposed St Helena 123 Pipeline Project falls within the Free State Province, and its planning context is informed by a range of provincial development and environmental management frameworks. These frameworks provide strategic direction for land-use management, infrastructure development, environmental protection, and socio-economic growth within the province.

5.3.1 FREE STATE PROVINCIAL GROWTH AND DEVELOPMENT STRATEGY (PGDS)

The Free State PGDS sets out the long-term development vision for the province, focusing on:

- sustainable economic growth,
- investment in strategic infrastructure,
- responsible natural-resource management, and
- strengthening environmental governance.

The PGDS places specific emphasis on improving bulk water infrastructure, ensuring resilience in water-scarce environments, and supporting mining communities through upgraded and well-maintained infrastructure. The proposed pipeline aligns with these priorities by enhancing water-transfer infrastructure associated with Harmony's operations and supporting broader provincial goals around resource efficiency and environmental sustainability.

5.3.2 FREE STATE SPATIAL DEVELOPMENT FRAMEWORK

The FS-SDF provides spatial guidance for development across the province, identifying priority development corridors, environmentally sensitive areas, and zones requiring careful management. Key directives relevant to this project include the need to (a) support the building of infrastructure that optimises the use of already-transformed or mining-disturbed land, (b) limit new disturbance in sensitive biodiversity areas unless mitigation is achievable, (c) promote linear infrastructure within established operational corridors, and (d) ensure that development in rural and mining landscapes contributes to long-term environmental and socio-economic resilience.

The pipeline's alignment largely follows existing operational corridors and occurs within an already disturbed mining landscape, which is consistent with the SDF's spatial planning principles.

5.3.3 FREE STATE ENVIRONMENTAL MANAGEMENT FRAMEWORKS (EMF)

Several EMFs are associated with the Free State Province. These planning documents guide development in the province towards being environmentally responsible and sustainable. As part of the EMFs, areas of the province are classified according to their environmental sensitivity. The documents further guide development to take place in areas where environmental impacts can be managed more effectively.



Involving the construction of an above-ground pipeline with a limited footprint, and also being in an already-disturbed area, the project is consistent with EMF objectives of promoting infrastructure in areas of lower environmental value while ensuring full mitigation in areas of higher sensitivity.

5.4 MUNICIPAL POLICY AND PLANNING CONTEXT

The project aligns with municipal policy and planning documents, particularly the IDPs of the Local, and District Municipalities.

5.4.1 MATJHABENG LOCAL MUNICIPALITY IDP

The Matjhabeng Local Municipality's IDP sets out the municipality's medium to long-term development priorities, including infrastructure upgrades, service-delivery improvement, land-use planning, and sustainable economic growth. The IDP is reviewed annually to align projects with evolving needs and to guide capital investment within the municipality.

Key strategic objectives within recent IDPs include infrastructure maintenance, local economic development, and alignment with spatial planning tools such as the Municipal Spatial Development Framework (SDF). These objectives are directly relevant to the proposed St Helena 123 Pipeline Project, as the project supports improved water management infrastructure, aligns with existing operational corridors, and limits new environmental disturbance—consistent with the municipality's drive to optimise existing infrastructure and promote sustainable land use

5.4.2 LEJWELEPUTSWA DISTRICT MUNICIPALITY IDP

The Lejweleputswa District Municipality's IDP provides a district-level framework for coordinated development, focusing on infrastructure investment, regional economic development, environmental management, and improving access to basic services. The IDP emphasises the need for upgrading water, energy, and transport systems to stimulate economic activity and support mining-affected communities.

These district-level priorities align closely with the proposed pipeline project, which enhances the reliability of water-transfer infrastructure that supports mining operations and contributes to regional economic resilience. The project's location within existing disturbed mining areas further aligns with the district's spatial development rationale, which encourages development in areas already transformed by mining rather than undisturbed landscapes

6 NEED AND DESIRABILITY OF THE PROPOSED ACTIVITY

The needs and desirability analysis component of the "Guideline on need and desirability in terms of the EIA Regulations (Notice 819 of 2014)" includes, but is not limited to, describing the linkages and dependencies between human well-being, livelihoods and ecosystem services applicable to the area in question, and how the proposed development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.). **Table 7** presents the needs and desirability analysis undertaken.



Table 7: Needs and desirability analysis for the proposed project

Ref No.	Question	Response
1	Securing ecological sustainable development and use of natural resources	
1.1	How were the ecological integrity considerations taken into account in terms of: Threatened Ecosystems, Sensitive and vulnerable ecosystems, Critical Biodiversity Areas, Ecological Support Systems, Conservation Targets, Ecological drivers of the ecosystem, Environmental Management Framework, Spatial Development Framework (SDF) and global and international responsibilities.	<p>The placement and design of the proposed St Helena 123 Pipeline Project have been informed by the ecological characteristics and sensitivities of the receiving environment. Although certain themes in the national Screening Tool flag Very High sensitivities, particularly for Terrestrial Biodiversity, the Site Sensitivity Verification Report (SSVR) confirmed that the project area is highly disturbed due to historic and ongoing mining activities. As a result, the ecological sensitivities identified by the Screening Tool were verified to be significantly lower on-site.</p> <p>The alignment of the pipeline has therefore been directed through already-transformed mining landscapes, previously disturbed habitat, and along an established pipeline corridor. This approach reduces potential impacts on Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), despite the fact that these features intersect the broader project footprint. The SSVR specifically notes that although the Screening Tool mapped the route as intersecting CBA 1 and ESA 2, field verification confirmed that these areas no longer retain high ecological integrity due to substantial anthropogenic disturbance.</p> <p>Where unavoidable, such as the six regulated wetland areas within 500 m of the alignment, these features have been fully assessed through specialist aquatic studies and will be addressed through the Water Use Licence Application (WULA). The above-ground design using prefabricated concrete plinths minimises soil disturbance, maintains surface hydrology, and reduces ecosystem fragmentation</p>
1.2	How will this project disturb or enhance ecosystems and / or result in the loss or protection of biological diversity? What measures were explored to avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy the impacts? What measures were explored to enhance positive impacts?	Refer to the baseline ecological information in Section 9, and the impact assessment and mitigation measures in Section 10 of this Report. Efforts have been made to avoid any identified impacts/ disturbance to sensitive environmental constraints.
1.3	How will this development pollute and / or degrade the biophysical environment? What measures were explored to either avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy the impacts? What measures were explored to enhance positive impacts?	The proposed St Helena 123 Pipeline Project has the potential to generate limited biophysical impacts, primarily during the construction phase. Temporary dust generation, vehicle emissions, and disturbance of surface soils are expected where plinth foundations are prepared and pipeline sections are installed.



Ref No.	Question	Response
		<p>Soil disturbance is minimal due to the above-ground design. Only the immediate footprint of prefabricated concrete plinths is cleared and levelled, substantially reducing the risk of erosion, sedimentation, or long-term soil degradation. The project's design avoids trenching, thereby reducing the potential for large-scale disturbance or sediment mobilisation that could affect surrounding ecosystems</p> <p>Potential impacts on surface water and wetlands are limited to six regulated wetland areas where the pipeline corridor intersects the 500 m zone of regulation. These risks are being addressed through specialist aquatic studies and incorporation of mitigation requirements into the Water Use Licence Application (WULA).</p> <p>To avoid or minimise impacts, construction activities will be constrained to already-disturbed operational mining areas, thereby preventing new disturbance to intact habitats.</p>
1.4	<p>What waste will be generated by this development? What measures were explored to avoid waste, and where waste could not be avoided altogether, what measures were explored to minimise, reuse and / or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?</p>	<p>The project is not expected to generate significant waste streams, as no dedicated laydown areas, construction camps, or large-scale material storage zones are planned. Any waste generated during construction will primarily consist of small quantities of hazardous materials such as lubricants, sealants, packaging, and consumables associated with pipeline assembly.</p>
1.5	<p>How will this project disturb or enhance landscapes and / or sites that constitute the nation's cultural heritage? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy the impacts? What measures were explored to enhance positive impacts?</p>	<p>The project is located entirely within a highly disturbed mining landscape, where historical and ongoing mining activities have already transformed the natural visual and cultural character of the area. The archaeological and heritage context has been extensively altered, with remnants of early mining activities representing the primary heritage sensitivities still present in the landscape. As noted in the Site Sensitivity Verification work, the area is classified as having Low heritage sensitivity, and the archaeological context is considered already disturbed.</p>
1.6	<p>How will this project use and / or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy the impacts? What measures were explored to enhance positive impacts?</p>	<p>The project makes limited use of non-renewable natural resources, owing to its above-ground design and the fact that construction is confined to an already-disturbed mining landscape. The primary non-renewable materials required include steel pipeline components and prefabricated concrete plinths.</p> <p>Because the pipeline is installed above-ground, the project avoids extensive excavation, which prevents unnecessary disturbance of soil and underlying geological resources. The pipeline corridor also follows an existing, previously</p>



Ref No.	Question	Response
		<p>assessed alignment, meaning no new extraction of raw materials or large-scale land transformation is needed to accommodate the route.</p> <p>The project's operational activities will not require any new abstraction of water or additional consumptive use of non-renewable resources. The system will convey return water already generated within Harmony's Free State operations, with no freshwater abstraction or new water demand arising from the project. This prevents long-term pressure on regional water resources, which are among the most sensitive non-renewable natural assets in the area.</p>
1.7	<p>How will this project use and / or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and / or impacts on the ecosystem jeopardise the integrity of the resource and / or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds? What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts?</p>	<p>The project has a limited interaction with renewable natural resources, given its small, linear footprint, above-ground design, and location almost entirely within disturbed mining landscapes. The primary renewable resources potentially affected are land and water, although the project has been designed specifically to minimise additional pressure on both.</p>
1.7.1	<p>Does the proposed project exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialised growth)?</p>	<p>The project has a limited interaction with renewable natural resources, given its small, linear footprint, above-ground design, and location almost entirely within disturbed mining landscapes. The primary renewable resources potentially affected are land and water, although the project has been designed specifically to minimise additional pressure on both.</p>
1.7.2	<p>Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used?</p>	<p>The project constitutes an appropriate and justifiable use of natural resources because it makes use of existing disturbed mining land, follows a previously assessed pipeline corridor, and requires minimal new resource inputs. The land that will be used for the pipeline no longer provides high ecological integrity due to decades of mining activity, as confirmed through the Site Sensitivity Verification Report, which found that screening tool "Very High" sensitivities are not reflective of actual on-site conditions. This demonstrates that the project does not divert high-value or intact land away from ecological or social functions.</p> <p>The project also supports intragenerational equity, as it strengthens the reliability and efficiency of the water-management system that underpins Harmony's operations which is an important local employer and economic driver for surrounding communities. By ensuring more stable water transfer within the</p>



Ref No.	Question	Response
		mining complex, the project contributes to sustaining local economic activity without creating new environmental burdens.
1.7.3	Do the proposed location, type and scale of development promote a reduced dependency on resources?	Yes, the location, type and scale of the project promote reduced dependency on resources. Firstly, the project enables the re-use of water resources for current mining operations and activities. This means that no additional water will be abstracted or needed for operations which will be supported by the water being transported by the pipeline.
1.8	How were a risk-averse and cautious approach applied in terms of ecological impacts:	
1.8.1	What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	See Section 12 for an overview of the assumptions and limitations associated with this project and the studies undertaken.
1.8.2	What is the level of risk associated with the limits of current knowledge?	The level of risk associated with the limits of current knowledge is captured in Section 12. Mitigation measures have been incorporated to reduce the level of risk attributed with limits of current knowledge (refer to Section 10 for the impacts and mitigation measures).
1.8.3	Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	A risk-averse and cautious approach was applied throughout the project design and assessment process to address uncertainties and minimise ecological risks. These are captured in the various specialist reports and built into the mitigation measures proposed to address identified impacts.
1.9	How will the ecological impacts resulting from this development impact on people's environmental right in terms following?	
1.9.1	Negative impacts: e.g. access to resources, opportunity costs, loss of amenity (e.g. open space), air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	See Section 10 which details all anticipated negative impacts associated with the proposed project.
1.9.2	Positive impacts: e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures were taken to enhance positive impacts?	See Section 10 which details all anticipated positive impacts associated with the proposed project.



Ref No.	Question	Response
1.10	Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.)?	Human well-being and livelihoods in the project area are closely tied to the stability and continuity of Harmony's mining operations, which serve as a significant economic driver and employer in the region. The proposed pipeline forms part of the internal water-management network supporting multiple interconnected mining right areas. Maintaining efficient water transfer supports the operational reliability of these mining areas, thereby sustaining employment and economic activity that communities depend on.
1.11	Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives / targets / considerations of the area?	The project is expected to have limited negative impacts on ecological integrity due to the highly disturbed nature of the receiving environment. Although the project interacts with ecological features of low current integrity, the design and route selection ensure that impacts are kept to a minimum. By confining development to previously transformed land, maintaining hydrological connectivity, and applying specialist-recommended mitigation, the project supports ecological integrity objectives by avoiding new disturbances, minimising residual impacts, and ensuring ecological processes are not further compromised in an already highly altered landscape.
1.12	Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the "best practicable environmental option" in terms of ecological considerations?	Where applicable, project alternatives are contemplated in Section 7 of this report.
1.13	Describe the positive and negative cumulative ecological / biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and existing and other planned developments in the area?	See Section 10 which details all anticipated negative cumulative ecological/biophysical impacts associated with the proposed project.
2	Promoting justifiable economic and social development	
2.1	What is the socio-economic context of the area, based on, amongst other considerations, the following:	
2.1.1	The IDP (and its sector plans' vision, objectives, strategies, indicators and targets) and any other strategic plans, frameworks or policies applicable to the area	The Matjhabeng Local Municipality Integrated Development Plan (IDP) sets out the municipality's overarching development vision, objectives, and priorities, including infrastructure upgrades, spatial restructuring, local economic development, and the optimisation of existing infrastructure systems.



Ref No.	Question	Response
		<p>At district level, the Lejweleputswa District Municipality’s IDP reinforces similar strategic objectives, highlighting the need for coordinated infrastructure development, improved basic services, and support for mining-affected communities. The district IDP emphasises upgrading water, energy, and transport systems as key enablers of regional economic stability.</p>
<p>2.1.2</p>	<p>Spatial priorities and desired spatial patterns (e.g. need for integrated of segregated communities, need to upgrade informal settlements, need for densification, etc.),</p>	<p>The project aligns closely with the spatial priorities of various associated IDPs and SDFs. The pipeline is intentionally located within an already-disturbed mining landscape and follows a previously assessed linear infrastructure corridor. This approach avoids unnecessary expansion of infrastructure into greenfield areas and supports the municipality’s goal of spatial consolidation, ensuring that development occurs where services, access routes, and operational systems are already in place.</p>
<p>2.1.3</p>	<p>Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.), and</p>	<p>The spatial character of the project area is defined predominantly by long-standing mining activities and associated infrastructure. The land traversed by the proposed St Helena 123 Pipeline consists of multiple properties within Harmony Gold’s operational footprint. These areas are already highly transformed, with extensive historical disturbance from mining, stockpiling, haul roads, and water-management infrastructure.</p> <p>Because the pipeline follows an existing disturbed linear infrastructure corridor, its placement aligns with these planned spatial patterns. It does not introduce new development into undeveloped areas, nor does it alter cultural landscapes or require land-use changes outside existing mining zones.</p>
<p>2.1.4</p>	<p>Municipal Economic Development Strategy (“LED Strategy”).</p>	<p>The Matjhabeng Local Municipality’s Local Economic Development (LED) Strategy focuses on strengthening the region’s mining-based economy, promoting inclusive economic growth, improving infrastructure, and supporting job creation within established economic sectors. At a district scale, the Lejweleputswa District Municipality’s IDP presents similar LED priorities, specifically underscoring the importance of upgrading water, energy, and transport infrastructure to bolster economic activity within mining-affected communities. These district-level objectives align closely with the need for reliable water-transfer infrastructure, such as the proposed St Helena 123 Pipeline.</p> <p>The proposed pipeline directly supports these LED priorities by improving the efficiency and reliability of the water-management system that underpins Harmony’s Free State mining operations. This, in turn, contributes to sustaining</p>



Ref No.	Question	Response
		<p>local employment, stabilising the regional economy, and reinforcing the municipality's strategic economic development agenda. By enhancing critical infrastructure within an existing mining landscape, the project aligns with and advances the core goals of both local and district LED frameworks.</p>
<p>2.2</p>	<p>Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area?</p>	<p>See Section 10 which considers the different impacts of the project. While mainly indirect, the project will have an impact on the further development of Harmony's free State operations, which in turn will have socio-economic impacts across the region.</p>
<p>2.2.1</p>	<p>Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?</p>	<p>Yes, the project aligns with the LED strategies of the local municipalities and local socio-economic initiatives. Refer to 2.1.4.</p>
<p>2.3</p>	<p>How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?</p>	<p>This project supports the physical, developmental, and social needs of local communities by reinforcing the stability of Harmony's mining operations, which are a major source of employment and economic activity in the region. By improving internal water-transfer efficiency between multiple mining right areas, the project helps sustain livelihoods dependent on continued mining operations.</p>
<p>2.4</p>	<p>Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long-term? Will the impact be socially and economically sustainable in the short- and long-term?</p>	<p>Project supports equitable intra- and intergenerational impact distribution by reinforcing an existing water-management network without creating new demands on natural resources or introducing environmental burdens that could disadvantage current or future communities. Because the pipeline transfers return water already generated within Harmony's operations, rather than abstracting new freshwater, it avoids increasing pressure on limited water resources and therefore protects long-term environmental availability.</p> <p>Its location within an already-disturbed mining landscape ensures that impacts are confined to transformed areas rather than shifting environmental or social costs onto surrounding communities. By improving operational reliability across multiple mining right areas, the project contributes to economic stability and sustains the livelihoods of those dependent on mining-related employment. With minimal new disturbance, no additional labour influx, and no expansion into greenfield areas, the development remains socially and economically sustainable over both the short and long term while supporting ongoing regional economic resilience.</p>



Ref No.	Question	Response
2.5	In terms of location, describe how the placement of the proposed development will:	
2.5.1	Result in the creation of residential and employment opportunities in close proximity to or integrated with each other.	The development will not directly create integrated residential and employment opportunities. However, the project does support the broader development of Welkom and the Free State in general and will ensure continued employment for many personal employed at Harmony's Free State operations.
2.5.2	Reduce the need for transport of people and goods.	The project will not have a significant impact on the movement of people and goods. However, this project will optimise the transportation of water generated through mining activities.
2.5.3	Result in access to public transport or enable non-motorised and pedestrian transport (e.g. will the development result in densification and the achievement of thresholds in terms of public transport),	The project will have little impact, if any, on public transport or enable non-motorised and pedestrian transport.
2.5.4	Compliment other uses in the area,	The project compliments and supports current mining activities in the region. The pipeline will contribute to the continued operation and optimisation of these activities.
2.5.5	Be in line with the planning for the area.	Refer to 2 of this table which provides more information on how the project aligns with relevant development plans.
2.5.6	For urban related development, make use of underutilised land available with the urban edge.	The project makes use of already-disturbed land as well as existing optimal routes for the proposed activity.
2.5.7	Optimise the use of existing resources and infrastructure,	While the pipeline follows existing and already-disturbed pipeline routes, existing connection points, culverts and crossings are among some of the infrastructure which will be utilised.
2.5.8	Opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement),	The proposed pipeline alignment avoids unnecessary bulk infrastructure expansion into non-priority or undeveloped areas. Instead, it is intentionally positioned within an already-disturbed mining landscape and follows an existing authorised or previously assessed pipeline corridor. This reduces the opportunity cost that would arise if new infrastructure were placed in areas not aligned with municipal spatial priorities or settlement-reconstruction objectives.



Ref No.	Question	Response
2.5.9	Discourage “urban sprawl” and contribute to compaction / densification.	The project will not encourage urban sprawl as it is located in already-developed areas.
2.5.10	Contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs,	The project contributes to correcting historically distorted spatial patterns by ensuring that new infrastructure investment is directed into areas that are already developed, serviced, and historically shaped by mining activity rather than expanding into new or peripheral zones. The alignment of the pipeline remains entirely within Harmony Gold’s existing Free State mining rights, which form part of a long-established mining landscape.
2.5.11	Encourage environmentally sustainable land development practices and processes	<p>The proposed pipeline encourages environmentally sustainable land development practices and processes in several key ways. First, the project is intentionally aligned within an already-disturbed mining landscape and follows a previously assessed pipeline corridor. This approach significantly limits new habitat disturbance, prevents unnecessary transformation of intact environments, and supports sustainable land-use efficiency by consolidating infrastructure within existing operational footprints rather than extending development into greenfield areas.</p> <p>Second, the above-ground pipeline design minimises excavation and soil disturbance, reducing impacts on local ecological processes, hydrology, and biodiversity. The use of prefabricated concrete plinths further reduces the footprint and avoids continuous trenching, allowing natural drainage patterns and ecological functioning to continue largely undisturbed.</p> <p>Third, the route intersects wetland regulated areas only where unavoidable, and these intersections are being fully assessed through the Water Use Licence Application (WULA) and specialist aquatic studies. This ensures that wetland sensitivities, hydrogeological processes, and ecosystem services are appropriately considered and mitigated, supporting responsible environmental stewardship.</p>
2.5.12	Take into account special locational factors that might favour the specific location (e.g. the location of a strategic mineral resource, access to the port, access to rail, etc.),	The project is situated entirely within Harmony Gold’s existing Free State mining operations, allowing it to integrate directly with the established water-management system that links the St Helena 123 Return Water Dam, St Helena 4 Return Water Dam, and Dam 13. This internal operational alignment ensures efficient water transfer across multiple interconnected mining areas, including St Helena (MR85), Harmony, Virginia, Merriespruit, Unisel, Brand, Saaiplaas, Masimong (MR82), and Bambanani (MR83).



Ref No.	Question	Response
2.5.13	The investment in the settlement or area in question will generate the highest socio-economic returns (i.e. an area with high economic potential).	The project will enhance mining operations and infrastructure of the region. This will ultimately lead to economic upliftment of the region, as well as the Free State Province.
2.5.14	Impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area, and	As the project is located in a disturbed mining area, anticipated impacts on sense of history, sense of place, and heritage of the area is considered low.
2.5.15	In terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?	The projects forms part of a larger project. In itself, the project is not a catalyst to create a more integrated settlement, however, as part of the larger Nooitgedacht project, this project contributes to the development of Welkom and streamlining of mining activities in the region.
2.6	How was a risk-averse and cautious approach applied in terms of socio-economic impacts:	
2.6.1	What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	Refer to Section 12 for the Assumptions and Limitations related to this project. Some to note here includes the potential for the project to intersect with below-ground heritage features, as an example.
2.6.2	What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability and sustainability) associated with the limits of current knowledge?	Refer to Section 10 which highlights the impacts of the project. The project is will form part of Harmony's current mining operations hence will have little impact on communities
2.6.3	Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	Majority of the project footprint follows an already-authorized pipeline route of which impacts have been previously assessed. Altogether, the project is located in an already-disturbed area associated with mining activities.
2.7	How will the socio-economic impacts resulting from this development impact on people's environmental right in terms following:	
2.7.1	Negative impacts: e.g. health (e.g. HIV-Aids), safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	Refer to the identified impacts, their assessment and recommended mitigation measures in Section 10 of this report.
2.7.2	Positive impacts. What measures were taken to enhance positive impacts?	



Ref No.	Question	Response
2.8	Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socioeconomic impacts will result in ecological impacts (e.g. over utilisation of natural resources, etc.)?	
2.9	What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations?	
2.10	What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)? Considering the need for social equity and justice, do the alternatives identified, allow the "best practicable environmental option" to be selected, or is there a need for other alternatives to be considered?	
2.11	What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?	The potential impacts have been identified assessed as part of this Basic Assessment Report and mitigation measures have been recommended to prevent negative impacts in this regard. Refer to the identified impacts, their assessment and recommended mitigation measures in Section 10 of this report.
2.12	What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?	Refer to the identified impacts, their assessment and recommended mitigation measures in Section 10 of this report.
2.13	What measures were taken to:	
2.13.1	Ensure the participation of all interested and affected parties.	Refer to Section 8 for details regarding the public participation process undertaken for this project. The public participation process will continue as planned for the duration of the Basic Assessment review period. Notification of Interested & Affected Parties have included:
2.13.2	Provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation,	
2.13.3	Ensure participation by vulnerable and disadvantaged persons,	



Ref No.	Question	Response
2.13.4	Promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means,	<ul style="list-style-type: none"> • Notification Letters via Emails, Faxes and/or Registered Mail where details were available. • SMS notifications. • Publication of Newspaper Advertisements.
2.13.5	Ensure openness and transparency, and access to information in terms of the process,	
2.13.6	Ensure that the interests, needs and values of all interested and affected parties were taken into account, and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge,	
2.13.7	Ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein will be promoted?	
2.14	Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g. a mixture of low-, middle-, and high-income housing opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)?	
2.15	What measures have been taken to ensure that current and / or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?	Workers will be educated on a regular basis as to the environmental and safety risks that may occur within their work environment. Furthermore, adequate measures will be undertaken to ensure that the appropriate personal protective equipment is issued to workers based on the areas that they work and the requirements of their job. Their right to refuse work (if considered dangerous) will be included in the education programme.
2.16	Describe how the development will impact on job creation in terms of, amongst other aspects:	
2.16.1	The number of temporary versus permanent jobs that will be created.	It is anticipated that the use of local and the existing Harmony labour force will be utilised as far as possible. No new jobs are expected to be created.
2.16.2	Whether the labour available in the area will be able to take up the job opportunities (i.e. do the required skills match the skills available in the area).	Unskilled labour is expected to be obtained from surrounding towns and areas. Where a mismatch in skill required is encountered, the contractor will source the



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		required skilled labourers from towns and areas further from the site where applicable.
2.16.3	The distance from where labourers will have to travel.	The closest town to the site is Welkom, approximately 5 kms away. This is expected to be the closest point from which labourers will travel. The project is located very close to Welkom, and it is not expected that labourers will have to travel far distances.
2.16.4	The location of jobs opportunities versus the location of impacts.	The project is not expected to create any new job opportunities.
2.16.5	The opportunity costs in terms of job creation.	The opportunity costs in terms of job creation are considered low.
2.17	What measures were taken to ensure:	
2.17.1	That there were intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment.	The Basic Assessment process requires governmental departments to communicate regarding any application. In addition, all relevant Departments and key stakeholders have been notified about the project by the EAP and registered as Interested and Affected Parties. They will continue to be notified and engaged with regarding the project throughout the Basic Assessment process. Should any conflicts of interest between organs of state be identified, these will be resolved through the appropriate channels.
2.17.2	That actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures.	
2.18	What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage?	Environmental attributes that may be impacted by this project have been identified and where relevant, specialist input has been solicited to ensure that a rigorous impact assessment process is undertaken. Where positive impacts on the interests of the public have been identified (e.g. impact on existing land use, etc.), mitigation measures are put forward to enhance positive impacts and/or reduce negative impacts. Refer to the identified impacts, their assessment and recommended mitigation measures in Section 10 of this report.
2.19	Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?	Refer to the identified impacts, their assessment and recommended mitigation measures in Section 10 of this report.
2.20	What measures were taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage	The project is not expected to generate significant pollution or environmental degradation requiring substantial remediation costs. However, measures have been implemented to ensure accountability for any potential impacts



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	or adverse health effects will be paid for by those responsible for harming the environment?	
2.21	Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations?	Refer to Section 7 for details of the alternatives considered.
2.22	Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area?	Refer to the identified impacts, their assessment and recommended mitigation measures in Section 10 of this report.



7 PROJECT ALTERNATIVES

The identification of alternatives is a key aspect of the success of the impact assessment process. All reasonable and feasible alternatives must be identified and screened to determine the most suitable alternatives to consider and assess. There are, however, some significant constraints that have to be taken into account when identifying alternatives for a project of this scope. Such constraints include social, financial and environmental issues, which will be discussed as part of the evaluation of the alternatives for this project. Alternatives can typically be identified according to:

- Location alternatives (including design and layout);
- Scheduling alternatives;
- Process alternatives;
- Technology alternatives; and
- Activity alternatives (including the No-Go option).

For any alternative to be considered feasible, such an alternative must meet the need and purpose of the development proposal without presenting significantly high associated impacts. Section 6 provides an overview of the project need and desirability.

In this section the various alternatives considered are described and their advantages and disadvantages are presented where applicable. Furthermore, the feasibility of the considered alternatives, from both a technical as well as environmental perspective, is determined and the result thereof are the alternatives that will be investigated further in the EIA phase, towards the selection of preferred alternatives. Essentially, alternatives represent different means of meeting the general purpose and need of the proposed project through the identification of the most appropriate and feasible method of development, all of which are discussed below.

Alternatives can further be distinguished into discrete or incremental alternatives. Discrete alternatives are overall development options, which are typically identified during the pre-feasibility, feasibility and or scoping phases of the EIA process. Incremental alternatives typically arise during the EIA process and are usually suggested as a means of addressing identified impacts. These alternatives are closely linked to the identification of mitigation and management measures and are not specifically identified as distinct alternatives. This section provides information on the Project's location, process, technology and activity alternatives considered and assessed.

7.1 LOCATION ALTERNATIVES

Location alternatives can apply to the entire Project (e.g. the strategic decision to locate the proposed development at a specific geographical location), as well as more specific footprints of individual components of the project.

7.1.1 DEVELOPMENT LOCATION ALTERNATIVES

The location selected considered existing pipeline routes and recently authorised and assessed routes. The current route was perceived as the alignment which would have the least unforeseen or new impacts on the biophysical environment and follows existing pipeline routes. The project footprint also avoids sites which are not as extensively disturbed. No route or location alternatives have therefore been considered in this Basic Assessment Report.

The feasibility of route alternatives is significantly constrained by the presence of existing Harmony operational infrastructure, previously authorised pipeline corridors, and extensive historical disturbance across the project area. Any deviation from the existing disturbed alignment would introduce new environmental impacts, particularly to grassland habitat, wetland buffer areas, and landowner properties not currently affected by mining infrastructure. For these reasons, route alternatives were screened out as environmentally inferior.



7.1.2 DESIGN OR LAYOUT ALTERNATIVES

The design of the pipeline considers connecting pipelines (existing connection points at Dam 123 and St Helena 4). It makes use of existing infrastructure where possible including existing pipeline culverts, sections of existing pipeline to which the pipeline will be connected to (example at Dam 4 and St Helena 4), as well as existing access roads. To minimise excavation and the unnecessary disturbance of the area, the pipeline will be placed above ground on concrete plinths. This was selected as an alternative over having the pipeline placed underground.

A high-level assessment of above-ground versus underground pipeline installation options has been included below. The comparison demonstrates that the above-ground configuration remains the environmentally preferred alternative, with a substantially smaller disturbance footprint, lower hydrological impact, and reduced construction complexity within an already-transformed mining landscape.

The design alternatives considered focused primarily on the method of pipeline installation. While the alignment itself is constrained, the configuration of the pipeline that is, above-ground versus underground, was identified as the most meaningful point of comparison from an environmental and engineering perspective.

Alternative	Advantages	Disadvantages
Above-Ground Pipeline (Preferred Option)	<ul style="list-style-type: none"> • Minimal excavation and soil disturbance. • Lower construction cost and shorter installation timeframe. • Easier access for inspections, maintenance, leak detection, and repairs. • Reduced risk of disturbing underlying geology and heritage/palaeontological features. • Suitable for highly disturbed mining landscapes and existing operational corridors. 	<ul style="list-style-type: none"> • Visible in the landscape (aesthetic impact). • Requires engineered ramps at road crossings. • Localised vegetation clearing needed at plinth positions.
Underground Pipeline	<ul style="list-style-type: none"> • Reduced visual impact. • No need for over-road ramps; less interference with surface activities. 	<ul style="list-style-type: none"> • Significant excavation results in higher disturbance to soils, wetlands, and hydrological processes. • Higher construction cost, longer duration, and more specialised equipment. • Increased risk of exposing or damaging heritage/palaeontological resources. • Harder to inspect, detect leaks, and maintain while potentially increasing long-term environmental risk. • Greater spoil generation and rehabilitation requirements.

The evaluation of the above-ground and underground pipeline installation options indicates that the above-ground configuration represents the best practicable environmental option for the proposed development. This preference is driven primarily by the project's location within an already highly disturbed



mining landscape, where limiting additional ground disturbance is a key environmental consideration. An above-ground pipeline significantly reduces excavation requirements, thereby minimising impacts on soils, hydrogeological processes, and any remaining ecological features within the project area. In contrast, underground installation would require extensive trenching, spoil generation, and rehabilitation, introducing greater environmental risk without providing additional functional benefits.

From a technical and operational perspective, the above-ground alternative also offers improved accessibility for inspections, maintenance, and rapid leak detection, which is essential for managing return-water infrastructure safely and efficiently. These advantages contribute to reduced long-term environmental risk, particularly in relation to undetected leaks or structural failures. While the above-ground option introduces a minor visual impact and requires engineered ramps at road crossings, these effects are limited, readily manageable, and acceptable within the already transformed mining setting.

Given the balance of environmental, operational, safety, and cost considerations, the above-ground pipeline is therefore considered the most environmentally and technically suitable option for this project, and is carried forward as the preferred alternative in this Basic Assessment Report.

7.2 SCHEDULING ALTERNATIVES

Scheduling alternatives are sometimes known as sequencing or phasing alternatives. In this case an activity may comprise a number of components, which can be scheduled in a different order or at different times and as such produce different impacts.

Scheduling of the project will align to the recommendations of the specialists who were engaged as part of this Basic Assessment process. For instance, the phased clearing of vegetation. Given that the project will mainly disturb already-developed areas no scheduling alternatives were considered applicable to the project.

7.3 PROCESS ALTERNATIVES

Process alternatives imply the investigation of alternative processes or methods to achieve the same goal for the proposed Project. This includes using environmentally friendly designs or materials and re-using scarce resources like water and non-renewable energy sources. Process alternatives will be defined and implemented as incremental alternatives during the assessment and incorporated into the EMPr.

As previously stated, the above-ground design of the pipeline was a key alternative embedded into the design of the project. This design has implications on how the project is implemented in construction phase, and later managed in operation phase.

In this case, the process followed for pipeline installation is largely dictated by operational standards and engineering safety protocols. However, incremental process alternatives have been incorporated, including restricted-footprint clearing, minimised ground levelling at plinth locations, and the use of prefabricated supports to avoid continuous excavation. These refinements function as embedded mitigation and reduce the environmental footprint relative to traditional construction processes.

7.4 TECHNOLOGY ALTERNATIVES

The selection of the technology alternatives or techniques to be adopted for the construction and operation of the Project are described in this section.

Several technological alternatives were contemplated and embedded into the design of the pipeline. Firstly, to address the overall durability of the pipe itself, steel was chosen as a primary material of which the pipeline will be constructed. Secondly, being constructed of flanged pipe segments allows for the construction of the pipeline in segments or sections. This option also allows for more efficient maintenance throughout operation.

Although steel flanged pipes were selected by the Applicant as the standard material consistent with Harmony's existing Free State networks, a high-level review of alternative pipeline materials was undertaken. Options such as HDPE, GRP, or welded steel were not pursued further due to incompatibility with existing connection points, lower structural rigidity for above-ground spans, or increased maintenance limitations. Given operational safety



requirements, pressure tolerances, and long-term integration with the reclamation programme, flanged steel segments remain the most appropriate and technically viable technology for this project.

7.5 ACTIVITY ALTERNATIVES

Activity alternatives refer to project alternatives which requires a change in the nature of the proposed activity.

As this project involves the construction of a single pipeline, activity alternatives would not be applicable if the overall aim of the project is still to be achieved. No activity alternatives have therefore been assessed in this report.

As the project purpose is to transfer return water between fixed infrastructure (RWDs and Dam 13), no alternative activities could achieve the required outcome without introducing significantly greater environmental impacts or engineering risk. As such, activity alternatives were not considered reasonable for assessment.

7.6 NO GO ALTERNATIVE

The “No Go” or “No Action” alternative refers to the alternative of not embarking on the proposed project at all. It assumes that the activity does not go ahead, implying a continuation of the current situation or the status quo. It is important to note that the No Go alternative is the baseline against which all other alternatives and the development proposal are assessed. When considering the No Go alternative, the impacts (both positive and negative) associated with any other specific alternative, or the current project proposal would not occur and in effect the impacts of the No Go alternative are therefore inadvertently assessed by assessing the other alternatives. In addition to the direct implications of retaining the status quo, there are certain other indirect impacts, which may occur should the No Go alternative be followed. The ‘no-go’ alternative provides the means to compare the impacts of project alternatives with the scenario of a project not going ahead. In evaluating the ‘no-go’ alternative it is important to take into account the implications of foregoing the benefits of the proposed project.

As a ‘no-go’ alternative, should the pipeline not be constructed, consequences will be experienced across Harmony’s Free State operations, as mining activities intend to expand. A key repercussion of the ‘no-go’ alternative will be implications on water management, as St Helena 123 and 4 RWDs will not have the capacity for additional water being generated from their associated TSFs. While alternatives to this challenge could be found (e.g., a different pipeline route), these may not be the most effective option in addressing the challenge. A ‘no-go’ alternative to this will result in delays in the expansion of Harmony’s operations, and further impact on the socio-economic development of the area.

While the No-Go option would avoid construction-related impacts, it would prevent the necessary upgrading of Harmony’s internal water-management system, resulting in long-term operational constraints, potential exceedance of existing dam capacities, and reduced efficiency of reclamation activities across multiple mining rights. The No-Go alternative would therefore not meet the project’s purpose or the broader infrastructure requirements of the Free State operations.



8 STAKEHOLDER ENGAGEMENT

The Public Participation Process (PPP) is a requirement of several pieces of South African Legislation and aims to ensure that all relevant I&APs are consulted, involved and their opinions are taken into account and a record included in the reports submitted to Authorities. The process ensures that all stakeholders are provided this opportunity as part of a transparent process which allows for a robust and comprehensive environmental study. The PPP for the necessary authorisation required for the project needs to be managed sensitively and according to best practises in order to ensure and promote:

- Compliance with international best practice options;
- Compliance with national legislation;
- Establishment and management of relationships with key stakeholder groups; and
- Encouragement of involvement and participation in the environmental study and authorisation/approval process.

As such, the purpose of the PPP and stakeholder engagement process is to:

- Introduce the proposed project and process for the authorisation project;
- Explain the environmental authorisation;
- Determine and record issues, concerns, suggestions, and objections to the project;
- Provide opportunity for input and gathering of local knowledge;
- Establish and formalise lines of communication between the I&APs and the project team;
- Identify all significant issues for the project; and
- Identify possible mitigation measures or environmental management plans to minimise and/or prevent negative environmental impacts and maximise and/or promote positive environmental impacts associated with the project.

This Public Participation Report (PPR) lists all verbal and written issues raised by I&APs during the call to register period from the 15th of January 2026 to date. A breakdown of the PPP is given within the remaining sections of this PPR.

8.1 IDENTIFICATION OF INTERESTED AND AFFECTED PARTIES (I&APS)

An initial I&AP database has been compiled from historic projects in the area, and Windeed searches were conducted to obtain the contact details of the surrounding landowners. The I&APs referred to in the PPR include:

- Pre-identified and registered landowners and surrounding landowners;
- Pre-identified and registered key stakeholders;
- Regulatory authorities;
- Specialist interest groups; and
- All I&APs who responded to the initial notifications and requested to be registered.

Efforts to pre-identify key I&APs involved various avenues such as consultation with the proponent and known landowners within the study area, review of related previously conducted studies, and identification of key interest groups and authorities within the vicinity of the study area and municipality. Refer to APPENDIX D for the Key Stakeholder/I&AP Database.



8.1.1 LIST OF ORGANS OF STATE IDENTIFIED AND NOTIFIED

The following key I&APs, but not limited to, were notified of the proposed project and invited to participate in the public participation process:

- Matjhabeng Local Municipality
- Eskom Soc Ltd
- Free State Department of Agriculture and Rural Development
- Free State Department of Community Safety, Roads and Transport
- Free State Department of Cooperative Governance and Traditional Affairs
- Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs
- Free State Department of Mineral Resources and Energy
- Free State Department of Public Works and Infrastructure
- Free State Department of Water and Sanitation
- Free State Development Corporation
- Free State Heritage Resources Authority
- Lejweleputswa Development Agency
- Lejweleputswa District Municipality
- National Department of Agriculture Land Reform and Rural Development
- National Department of Cooperative Governance and Traditional Affairs
- National Department Of Forestry, Fisheries and Environment
- National Department Of Land Reform And Rural Development
- National Department of Transport
- National Department of Water and Sanitation
- National Energy Regulator of South Africa (NERSA)
- National House of Traditional Leaders
- South African Civil Aviation Authority
- South African Heritage Resources Agency
- South African National Biodiversity Institute
- South African National Roads Agency (SANRAL)
- Transnet Freight Rail
- Transnet Properties
- Vaal Central Water

8.1.2 LIST OF OTHER KEY I&APS IDENTIFIED AND NOTIFIED

- Pre-identified and registered landowners and surrounding landowners.
- Marli Self Catering Guest house (Flamingo Pan Welkom)
- BirdLife South Africa
- Centre for Environmental Rights
- Conservation South Africa
- Council for Geoscience
- EarthLife Africa
- Endangered Wildlife Trust
- Federation for a Sustainable Environment
- Free State Agriculture
- GroundWork South Africa
- Mining Affected Communities United in Action (MACUA)
- National Botanical Society
- Natural Justice
- South Durban Community Environmental Alliance
- The Green Connection



- Wetlands and Environmental Society
South Africa

8.2 INITIAL NOTIFICATION OF KEY I&APS

An initial call to register notification was sent out 5th of February 2026. Notification during this initial consultation was given in the manner described below.

8.2.1 FAXES, REGISTERED MAIL AND EMAILS

Notification letters (in English, Afrikaans, and Sesotho) were distributed to pre-identified I&APS through either faxes, SMSs, registered mail, and/or emails on the 5th of February.

The notification documents included the following information:

- Authorisations required;
- Sufficient detail of the proposed development to enable I&APS to assess/surmise what impact the development will have on them or the use of their land;
- The purpose of the proposed project;
- Details of the application processes associated with proposed activities;
- Details of the affected properties;
- Details of the South African environmental legislation that must be adhered to;
- Contact details of the EAP.

8.2.2 NEWSPAPER AND GAZETTE ADVERTISEMENTS

Advertisements (in English and Afrikaans) describing the proposed project and Environmental Impact Assessment (EIA) process were placed in the Welkom Vista with circulation in the vicinity of the study area on the 15th of January 2026. The newspaper adverts included the following information:

- Project name;
- Applicant name;
- Project location;
- Nature of the activity;
- Legislative requirements; and
- Relevant EIMS contact person for the project.

8.2.3 SITE NOTICE PLACEMENT

Ten (10) A1 Correx site notices (in English, Afrikaans, and Sesotho) were placed at 10 locations around the proposed project study area on the 5th of February 2026. The on-site notices included the following information:

- Project name;
- Applicant name;
- Project location;
- Map of proposed project area;
- Project description;
- Legislative requirements; and
- Relevant EIMS contact person for the project.



8.3 RECORD OF ISSUES RAISED

Comments on the proposed project were solicited from pre-identified and registered I&APs and key stakeholders. To date, the following comments have been received:

- I&AP registration.
- South African Civil Aviation Authority: Expressed that they had no further comment on the project.
- South African Heritage Resources Agency: Request for submission of SAHRIS Application
- Transnet: Request for locality information

All comments and/or queries received to date are included in this report and presented in APPENDIX D. This section will be updated for submission to the competent authority, the Department of Mineral and Petroleum Resources (DMPR), following the 30-day public review period of the BA Report.



9 ENVIRONMENTAL ATTRIBUTES AND BASELINE ENVIRONMENT

This section of the BA Report provides a description of the environment that may be affected by the proposed project. Aspects of the biophysical, social and economic environment that could be directly or indirectly affected by, or could affect, the proposed development have been described. This information has been sourced from existing information available for the area and where relevant specialist assessments.

9.1 PHYSICAL ENVIRONMENT

The following section provides an overview of the physical environmental attributes of the project area. This includes descriptions of climatic conditions, geology, surface water, and topography.

9.1.1 CLIMATE AND WEATHER

9.1.1.1 CURRENT AND HISTORIC CLIMATE

This region is characterised by a warm-temperate summer rainfall climate with the average annual precipitation being approximately 508 mm. High summer temperatures are common for this region with severe frost occurring throughout the winter (on average 37 days per year) (Mucina and Rutherford, 2006) (Figure 3).

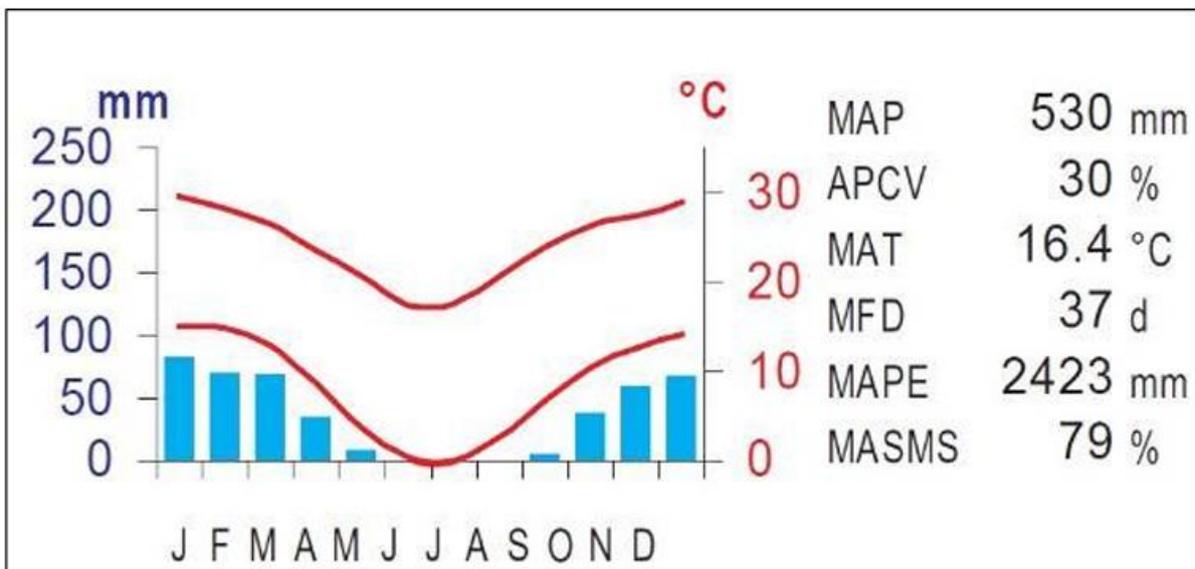


Figure 3: Climatic conditions associated with the site in the Free State province.

9.1.2 GEOLOGY AND SOILS

The proposed project area is underlain by Quaternary aeolian sand, Quaternary calcrete, the Adelaide Subgroup (Beaufort Group, Karoo Supergroup) and the Permian Volksrus Formation (Ecca Group, Karoo Supergroup). The updated geology compiled by the Council of Geosciences indicates that the proposed pipeline project area is underlain by alluvium, colluvium, elluvium and gravel, the Balfour Formation of the Adelaide Subgroup (Beaufort Group) and the Volksrust Formation of the Ecca Group. Refer to Figure 4 for geology map of the site.



In considering the Soil Conservation Service for South Africa (SCS-SA) dataset of the site, soils are classified as being in hydrological soil group B/C (moderately low to moderately high runoff potential) on the western side of the pipeline and group C (moderately high runoff potential) to the east. The soils within the project area comprise a mosaic of recharge-dominant, interflow-dominant and responsive wet hydropedological soil groups, including Mispah (shallow recharge), Clovelly (deep recharge), Swartland (slow recharge), Bloemdal (deep interflow), and Katspruit (responsive wet) forms. These soil groups form predictable hillslope patterns, with vertical infiltration dominating upper and midslope positions and lateral flow and saturation occurring primarily at valley bottoms.

Hydropedological modelling confirms that wetlands adjacent to the pipeline receive the majority of their moisture input from catchments north and north-east of the site, rather than from within the footprint. The proposed above-ground pipeline will not significantly alter recharge, lateral flow, or saturation dynamics, with the worst-case potential moisture loss to wetlands estimated at less than 1% of the total catchment water regime. Responsive wet soils (Katspruit) associated with natural wetlands will be avoided.

9.1.3 SURFACE WATER AND DRAINAGE

The project is situated within the Vaal–Orange Water Management Area, and at a finer scale, within quaternary catchments C42J and C43B. These catchments consist primarily of non-perennial drainage systems, artificial water bodies, pans, and shallow depressions. The hydrological setting is captured in Hydrology Assessment Section 2.6, which confirms that no major 1:500 000 mapped rivers traverse the footprint, and the nearest significant watercourse is the Sand River, located to the south of the project area. The terrain is gently sloped (<3%), with elevations ranging from 1,330 to 1,370m amsl, creating a low-energy surface water environment with diffuse drainage and slow runoff potential.

The region experiences a temperate summer-rainfall climate, receiving approximately 508mm mean annual rainfall, predominantly in the summer months. Evaporation is significantly higher, averaging ~2,408 mm per year, far exceeding annual precipitation. This climatic relationship underpins the dominance of depression wetlands and shallow ephemeral drainage features in the project area. For instance, the area is characterised by episodic, storm-driven runoff events, limited perennial or sustained flows, as well as strong dependence on rainfall, shallow subsurface flows, and soil-driven hydropedological processes for moisture distribution.

The wetland assessment identified six (6) natural depression wetlands (HGM Type 1) of which 500m ZoRs intersect with the project area. Figure 5 is a map indicating the locations of these features and their associated ZoRs. The wetlands receive water primarily from precipitation, shallow interflow, diffuse overland flow, and limited local groundwater discharge. They are classified as Least Concern (ecosystem threat status) and Poorly Protected nationally. They deliver moderately low ecosystem services, particularly sediment trapping, phosphate/nitrate assimilation, and limited flood attenuation. No natural wetland systems fall within the proposed pipeline footprint; all wetlands and their buffers are avoided.

Drainage features include a single A-section drainage line which traverses the project area (see Figure 5). This feature is characterised by its flow, which takes place in direct response to rainfall events. It has limited ecological functionality and Low sensitivity due to disturbance, simplified morphology, and poor water quality. It is, however, locally important for routing stormwater and preventing uncontrolled surface concentration. Several dams, reservoirs, artificial wetlands, and excavated pans occur in the project area. Figure 6 provides an illustrated overview of all surface water features associated with the site.

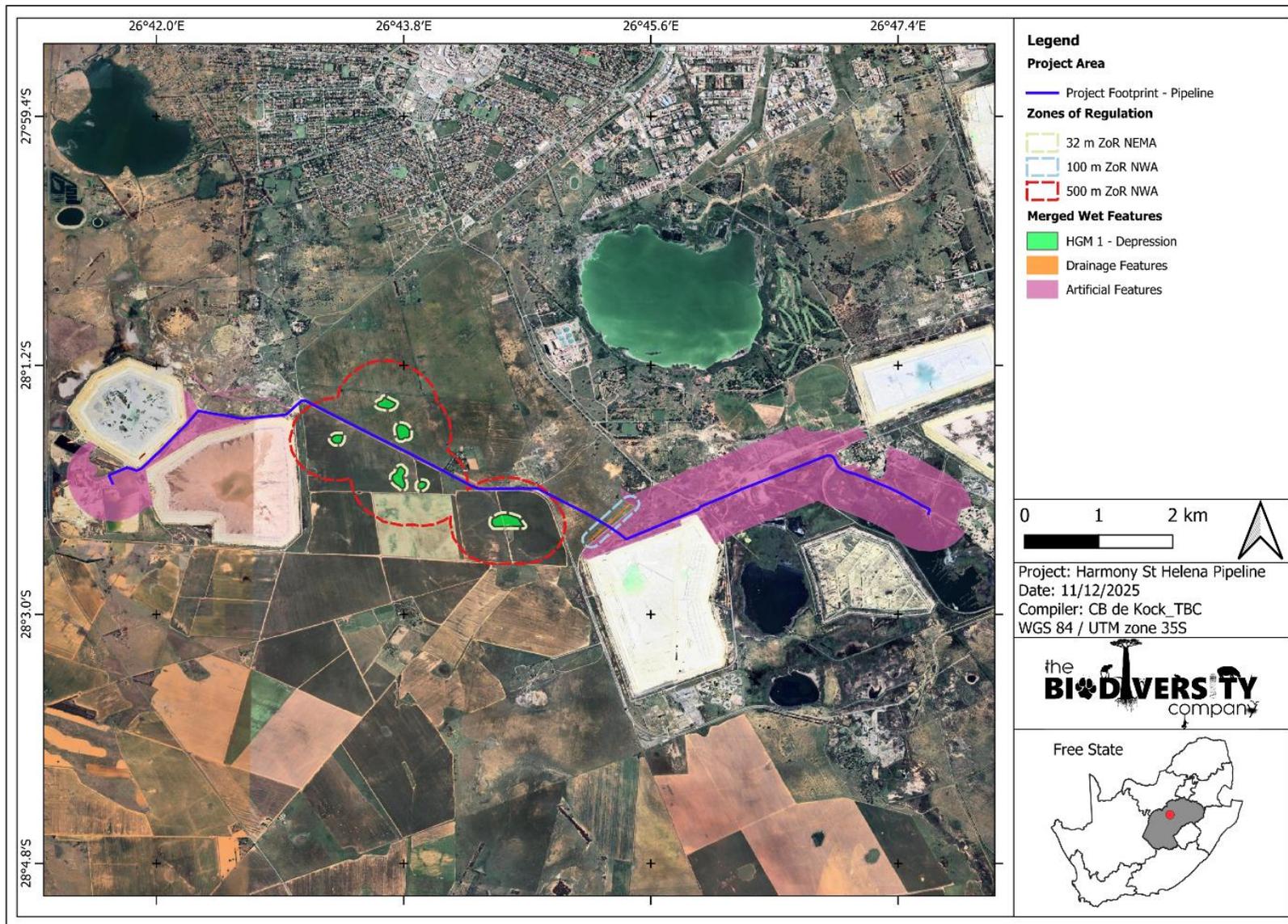


Figure 5: Zones of Regulation in relation to identified wetlands and drainage line.

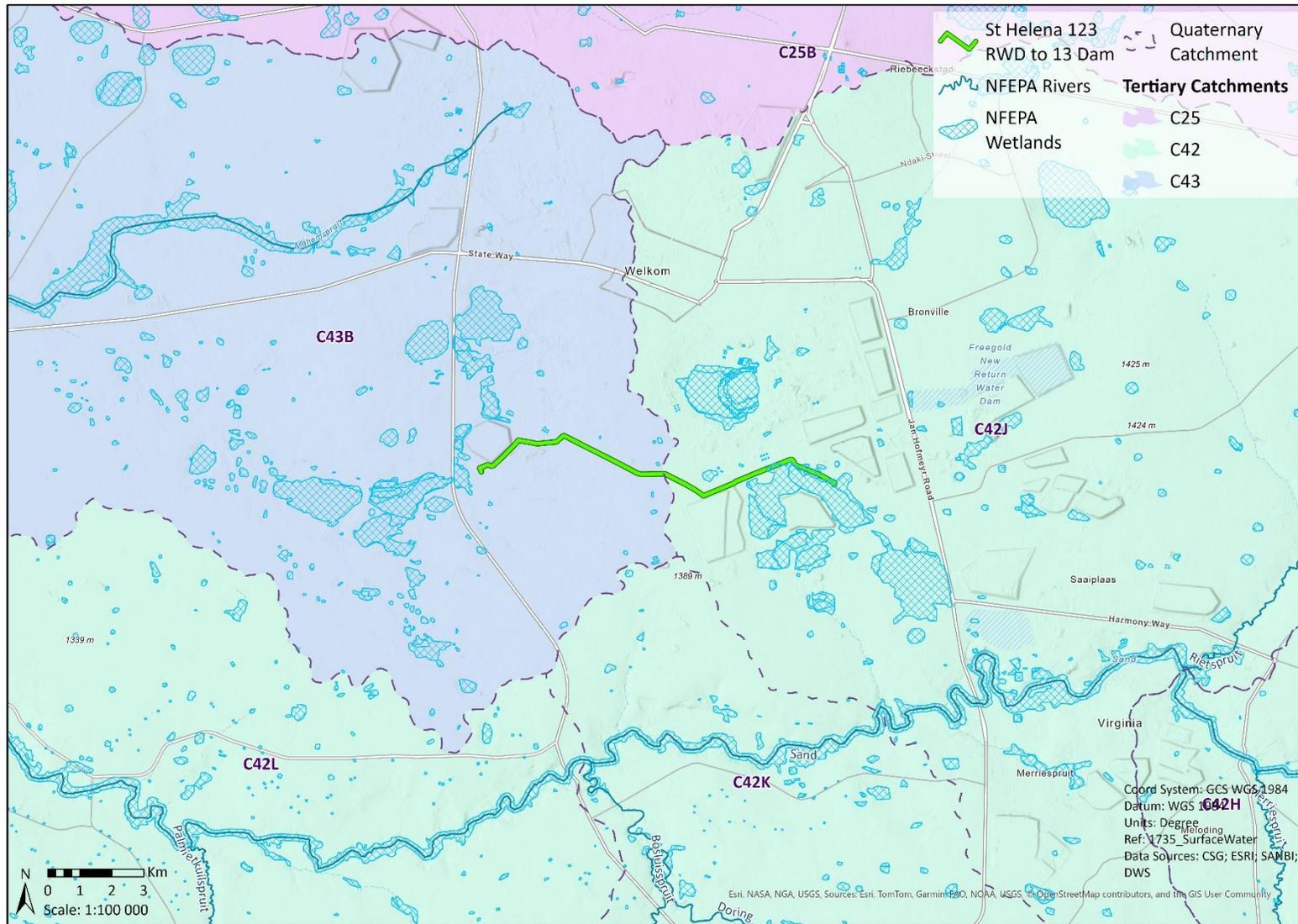


Figure 6: Surface water features associated with the site



Water quality of the project area is influenced predominantly by sediment inputs from cultivated lands, nutrient enrichment, runoff and seepage associated with surrounding mining activities, as well as episodic pulses from storm events.

9.1.4 TOPOGRAPHY

The topography of the project area is characterised by a gently undulating landscape, with elevations ranging from approximately 1330 to 1370m above mean sea level and slopes predominantly below 3%. The gentle relief also contributes to the weak hydrological connectivity observed across the site, where storm-driven overland flow rather than sustained drainage processes defines surface water movement. See Figure 7 for topographic map of the site.

9.2 BIOLOGICAL ENVIRONMENT

The terrestrial and aquatic environment has been assessed through a desktop assessment by The Biodiversity Company (TBC) and the associated specialist report is included in APPENDIX E. The baseline biological environments and specialist findings are presented in the following subsections.

9.2.1 OVERALL ECOLOGICAL BASELINE

Table 8 below has been produced as a result of the spatial data collected and analysed as provided by relevant sources. It presents a summative breakdown of the ecological boundaries considered and the associated relevance that each has to the region or project area.

Table 8: Summary of relevance of the proposed project to ecologically important landscape features

Desktop Considered	Information	Relevance	Reasoning
Ecosystem Threat Status - Red List of Ecosystems (RLE)		Relevant	Overlaps with a Least Concern (Western Free State Clay Grassland) and Endangered ecosystem (Vaal-Vet Sandy Grassland) ecosystem (RLE, 2022)
Ecosystem Level	Protection	Relevant	Overlaps with a Poorly Protected (PP) and Not Protected (NP) ecosystem (NBA, 2018)
Provincial Plan	Conservation	Relevant	Overlaps with Critical Biodiversity Area (CBA) 1, Ecological Support Areas (ESA2), Other Natural Areas and Degraded areas (DESTEA, 2024)
South Africa Protected Areas Database (SAPAD) and South Africa Conservation Areas Database (SACAD)		Relevant	Located approximately 7.5km from the Thabong Game Ranch ().
National Protected Areas Expansion Strategy (NPAES)		Irrelevant	No overlap with NPAES Priority Focus Areas (NPAES, 2018)
Key Biodiversity Areas (KBA)		Irrelevant	No KBAs located within the vicinity of the project area (KBA, 2024)



Desktop Considered	Information	Relevance	Reasoning
South African Inventory of Inland Aquatic Ecosystems (SAIIAE)		Irrelevant	Project area's 500m Regulated area overlaps with CR and LC wetlands and a CR River (Critically Endangered - CR) (NBA, 2018)
National Priority Area (NFEPA)	Freshwater	Relevant	Project area and its 500m Regulated area overlaps with non-priority FEPA wetlands
Strategic Water Area (SWSA)	Source	Irrelevant	Does not overlap with any SWSA (Le Maitre et al., 2018)

9.2.2 FLORA

The Screening Tool indicates that no flora SCC are expected to occur in the project area.

9.2.3 FAUNA

The Screening Tool indicates that two (2) fauna Species of Conservation Concern (SCC) are predicted to occur in the project area. See Table 9 for list of SCCs.

The Screening Tool report includes lists of bird, mammal, reptile, amphibian, butterfly and plant species of conservation concern known or expected to occur on the proposed development footprint. Some of these SCC are sensitive to illegal harvesting. Such species have had their names obscured and are listed as sensitive plant unique number/sensitive animal unique number. As per the best practice guideline that accompanies the protocol and screening tool, the name of the sensitive species may not appear in the BAR nor any of the specialist reports released into the public domain. It should be referred to as sensitive plant or sensitive animal and its threat status may be included, e.g. critically endangered sensitive plant or endangered sensitive animal.

Table 9: List of SCCs associated with the site

Species Name	Common Name	Screening Tool Sensitivity	Conservation Status		Likelihood of Occurrence	Reason
			Regional	Global		
Avifauna						
<i>Hydriectis maculicollis</i>	Spotted-necked Otter	Medium	VU	NT	Medium	Some suitable habitat is present on site but in a heavily degraded state.
Invertebrates						
Sensitive Species 15		Medium	VU	VU	Low	-

9.2.4 HABITATS

Four (4) main (terrestrial) habitat types were identified across the project area and include:

- Degraded Grassland;
- Degraded Secondary Grassland;
- Modified;
- Water Resources (artificial and drainage).

The habitat units for the project area can be seen delineated in Figure 8 and Figure 9, and descriptions of the habitat units can be found in Table 10.

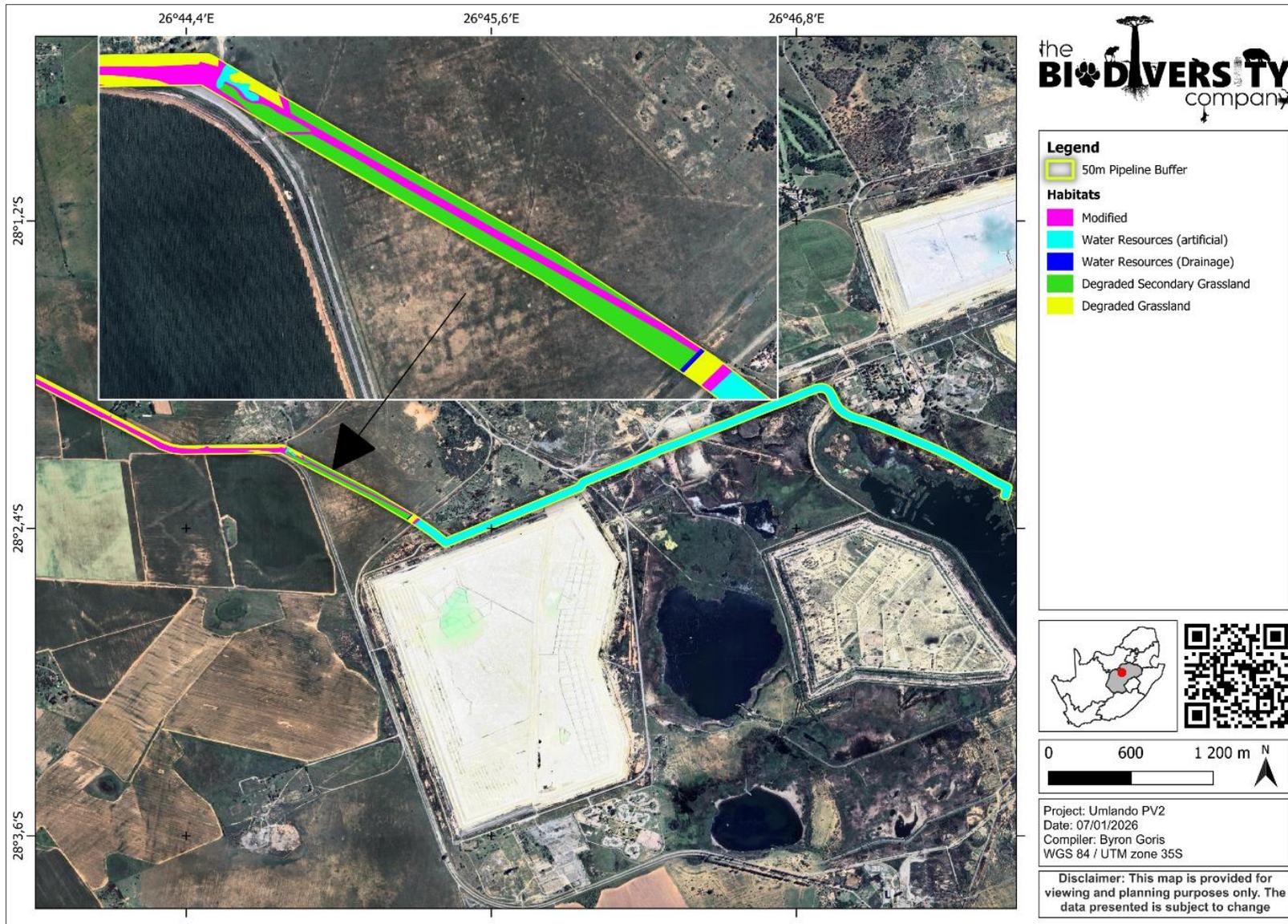


Figure 8: Habitats identified within the project area – Eastern Section

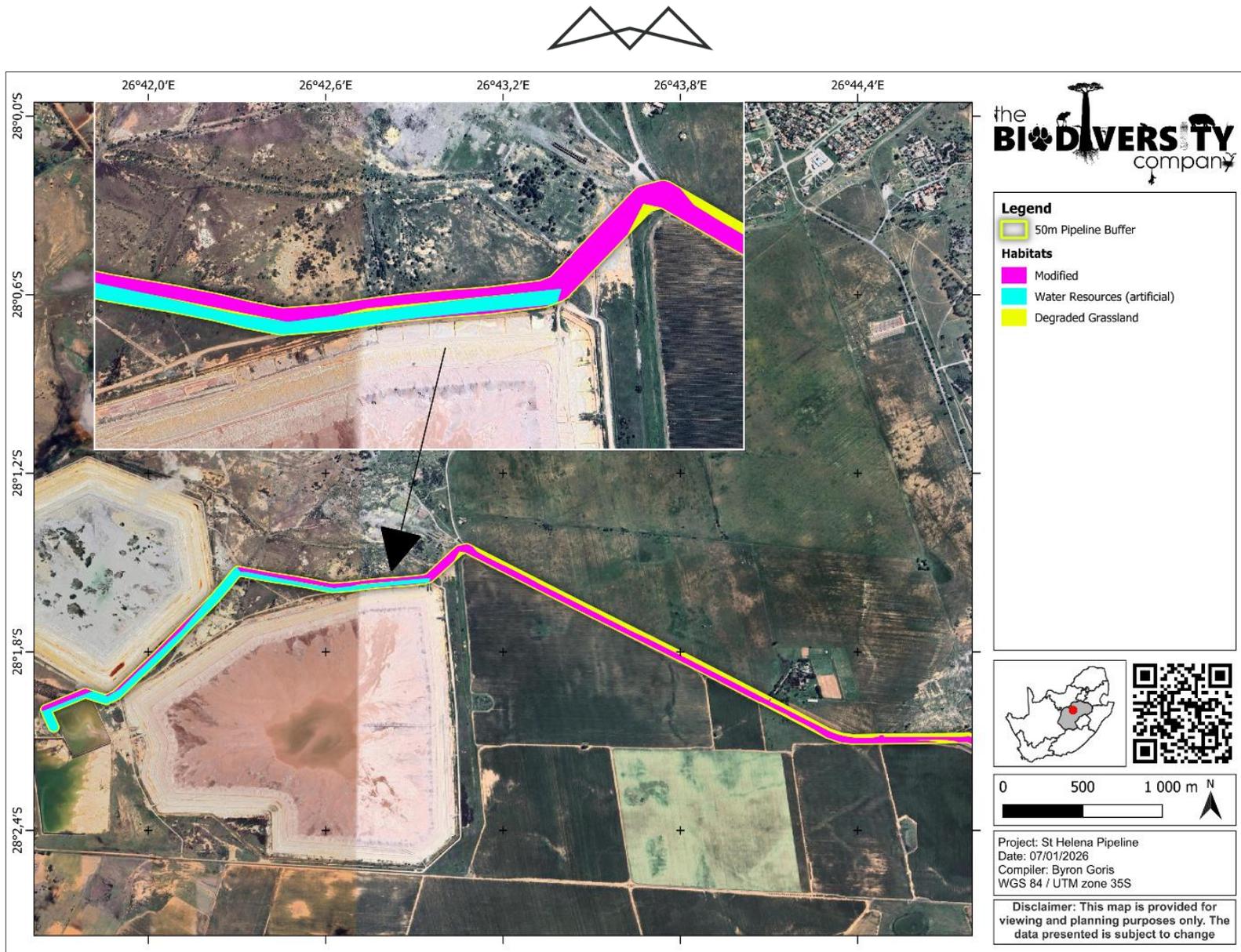


Figure 9: Habitats identified within the project area - Western Section



Table 10: Table providing descriptions of the habitat units delineated for the project area.

Habitat	Description and Condition
Degraded Grassland	<p>This habitat comprises fragmented grassland patches situated adjacent to agricultural fields and active mining infrastructure, including existing pipelines. The vegetation is a mix of indigenous grasses—such as <i>Themeda triandra</i>, <i>Helichrysum nudifolium</i>, and <i>Eragrostis lehmanniana</i>—interspersed with Alien and Invasive Plant (AIP) species like <i>Eucalyptus camaldulensis</i> and <i>Cirsium vulgare</i>. The habitat is subject to ongoing disturbance from adjacent land uses, resulting in edge effects, soil compaction, and reduced ecological integrity. While indigenous flora persists, the structure and function of the grassland are compromised. Faunal activity was limited to common species, with scrub hare (<i>Lepus saxatilis</i>) and slender mongoose (<i>Galerella sanguinea</i>) encountered during the site survey.</p> <p>No flora SCC were recorded or are expected, and the area provides limited habitat for common fauna. The overall SEI is low, reflecting the degraded condition and limited conservation value. No longer representative of in-tact Vaal Vet Sandy Grassland.</p>
Water Resources	<p>This habitat comprises artificial wetlands and drainage features that have developed primarily as a result of historic mining activities. The area is characterized by altered hydrology, with waterlogged soils and standing water in some depressions. Vegetation is dominated by a mix of indigenous riparian species, such as <i>Imperata cylindrica</i> (Cogon Grass) and <i>Phragmites australis</i> (Common Reed), interspersed with widespread AIP species, including <i>Populus alba</i> (White Poplar) and <i>Tamarix ramosissima</i> (Saltcedar). The ecological integrity of these wetlands is low due to extensive disturbance, proliferation of AIPs, and ongoing impacts from adjacent mining operations. Locals also use these wetland areas for grazing livestock, while indigenous fauna is limited beyond common avifauna and mammals.</p> <p>The artificial and degraded nature of these wetlands results in low site ecological importance (SEI), and the habitat provides limited ecosystem services beyond basic water conveyance and occasional refuge for common species. No species of conservation concern (SCC) observed or expected.</p>
Degraded Secondary Grassland	<p>This habitat consists of fragmented remnants of natural grassland that have been subject to historic clearing, cultivation, and ongoing disturbance from mining-related activities. The vegetation community is a mosaic of indigenous grasses, herbs, and forbs—such as <i>Themeda triandra</i> (Red Grass), <i>Helichrysum nudifolium</i>, <i>Gazania krebsiana</i>, <i>Heteropogon contortus</i>, and <i>Ruschia intricata</i> (Barbed Tentfig)—alongside a significant presence of AIP species, including <i>Bidens pilosa</i> (Black Jack). The structure and composition are indicative of secondary grassland, with evidence of past agricultural use visible in satellite imagery. Major impacts include habitat fragmentation, edge effects, and soil disturbance. Indigenous fauna may utilize the area for foraging or movement, and common fauna burrows (scrub hare (<i>Lepus saxatilis</i>) and slender mongoose (<i>Galerella sanguinea</i>)) and common avifauna were noted.</p> <p>No flora or fauna SCC were recorded or are expected, given the disturbed state. The habitat retains some ecological function and limited representation of Vaal Vet Sandy Grassland., and overall SEI is low.</p>



Habitat	Description and Condition
Modified	<p>This habitat encompasses all areas that have been heavily transformed by mining infrastructure and activities, including well-used roads, historic and active TSFs, excavated material, and cleared land. Indigenous vegetation is almost entirely absent, with the ground layer dominated by AIP species and bare substrate. The area is subject to ongoing disturbance, compaction, and contamination, with negligible potential for natural ecological processes or habitat provision.</p> <p>No flora or fauna SCC were observed or are expected under current conditions. The very low ecological value and lack of indigenous habitat result in a very low SEI. Observations in these areas were primarily made from accessible perimeters due to safety and access constraints.</p>

9.3 SOCIAL AND CULTURAL ENVIRONMENT

This section provides an overview of the social and cultural baseline environment which the proposed pipeline will interact with.

9.3.1 LAND-USE

The landscape traversed by the pipeline is dominated by the presence of mining land, and abandoned mining operations. The area is highly disturbed by past and present mining activities. The landscape is characterised by surrounding TSFs and RWDs, along with mine buildings, shafts, and offices. Figure 10 provides an overview of the land cover associated with the site and surroundings. Note the extensive mine-related land uses.

9.3.2 DEMOGRAPHICS

The Free State Province has a population of approximately 2.96 million people, making it one of South Africa’s smaller provinces by population despite its substantial land area of roughly 129 835 km². Afrikaans, Sesotho, and isiXhosa are widely spoken across the province, with Sesotho being the dominant home language, reflecting the province’s strong Basotho cultural influence (supported by Census 2022 population composition data)(StatsSA, 2022). Although the Free State contributes markedly to South Africa’s agricultural and mining output, its population density remains relatively low, around 21 persons/km², owing to the large expanses of rural and agricultural land across the province.

9.3.3 ECONOMY

Considering available data, the Free State’s economy is shaped by a diverse mix of sectors, with mining, manufacturing, agriculture, and finance forming the backbone of provincial economic output. Mining historically dominated the region; however, recent economic reviews indicate structural shifts driven by declining gold production and the rise of manufacturing and finance as significant contributors.

Agriculture remains a critical pillar of the Free State’s economy, particularly because the province is one of South Africa’s major food-producing regions. It contributes approximately 6% to the provincial GDP, supported by extensive maize production, livestock farming, and agro-processing industries. Manufacturing accounts for 11% of provincial GDP, driven primarily by food and beverage production and chemicals. The province’s contribution to national GDP, however, has remained relatively flat over the past decade, partially due to the prolonged decline of the mining sector.

Focusing on the Lejweleputswa District Municipality, within which Welkom and Matjhabeng Local Municipality fall, the economy is distinctly shaped by its deep mining history. Welkom, founded on large gold deposits, historically served as one of South Africa’s key mining hubs. The town’s economic structure still mirrors this history: mining remains a central economic activity, although its dominance has diminished over time due to aging infrastructure, mine closures, and declining ore grades.

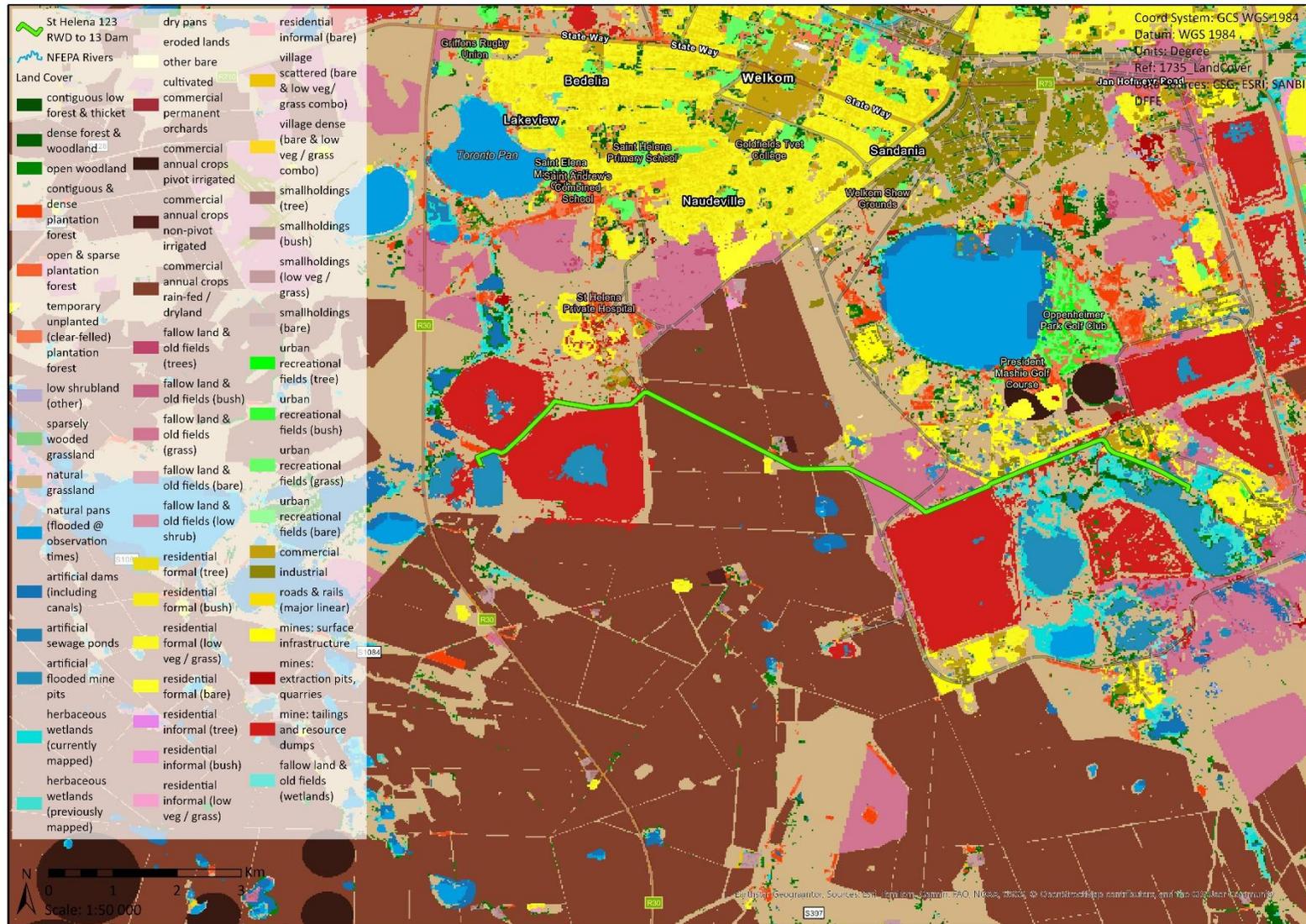


Figure 10: Land Cover associated with the site footprint and surroundings



Despite this decline, mining continues to play an important socio-economic role by providing employment opportunities and sustaining related service industries. The waves of mine downsizing explain the district's slow economic growth trajectory, with Lejweleputswa projected to record the lowest average annual economic growth rate in the province (-1.08%) between 2021 and 2026. The contraction is directly tied to the waning performance of the mining sector.

Beyond mining, Welkom's broader regional economy is supported by agriculture, particularly large-scale maize production and animal farming, which complement the district's traditional industrial base. Trade and service industries have also expanded in recent years as Matjhabeng positions itself as a regional service and retail hub.

Overall, the Free State's economic environment is defined by a shifting economic base: from mining-led growth historically toward a more balanced mix of agriculture, manufacturing, finance, and emerging renewable energy. Welkom remains emblematic of these transitions, with mining still central to its identity, agriculture providing stability, and renewed investment efforts signalling a shift toward a more diversified and sustainable local economy.

9.3.4 INFRASTRUCTURE AND PUBLIC SERVICES

The proposed pipeline route is situated within an already developed mining-dominated landscape south-west of Welkom, intersecting areas containing extensive mine infrastructure, return-water dams, access roads, and haul routes associated with Harmony operations. The alignment follows and crosses existing arterial, main, and secondary roads, benefiting from well-established internal road networks that provide reliable access for construction and maintenance activities. Within the broader urban footprint of Welkom, public services such as electricity supply, water-management systems, and operational mine services are already present, while settlements to the south (e.g., Virginia and Merriespruit) are supported by municipal road networks and service corridors. As a result, the project area is well integrated into an existing service environment, and no new bulk infrastructure is required to support the proposed pipeline.

9.3.5 CULTURAL HERITAGE

The Cultural heritage background of the project area, and the broader area can be associated with the Stone Age, Iron Age, and colonial periods. Further, the colonial and recent history of the area is steeped in history related to the mining industry.

9.3.5.1 STONE AGE

The broader region surrounding the project area reflects limited evidence of Stone Age occupation, with very little material known directly from within the pipeline footprint. Regional research indicates occurrences of Middle and Later Stone Age lithic materials, often associated with mammal fossil remains, located in erosion gullies along the Sand, Vet, and Doring Rivers between Virginia and Theunissen. No Earlier Stone Age or rock art sites are recorded within or immediately adjacent to the study area, and overall Stone Age presence is considered sparse and dispersed, with no known in-situ sites inside the development corridor.

9.3.5.2 IRON AGE

The project area lies west of the main distribution of documented Late Iron Age settlements, making the likelihood of Iron Age archaeological deposits in the footprint relatively low. However, the wider region contains two important cultural facies:

- **Thabeng Facies (Moloko Branch)**, associated with Sotho-Tswana groups such as the Tlhaping and Rolong, represented by Type Z settlements, that is, large stone-walled enclosures with distinctive bilobial dwellings, identified north-west of Ventersburg (site OXF1) and in the broader Highveld region.
- **Makgwareng Facies (Blackburn Branch)**, linked to Type V stone-walled settlements, which feature corbelled stone huts and cattle enclosures, with examples documented south-west of Winburg and around the wider region.

Although these cultural groups occupied the broader Highveld, no Iron Age settlements or structural remains occur within the pipeline area.



9.3.5.3 COLONIAL AND HISTORICAL BACKGROUND

The study area is embedded within a historically dynamic landscape shaped by Griqua movements, Voortrekker migration, early farming, and later South African War (1899-1902) military activity. The region saw troop movements and engagements during the Battle of Zand River (7-10 May 1900), including crossings near present-day Virginia and along routes surrounding the study area, though no confirmed battlefield features were identified within the pipeline corridor itself.

The early 20th century ushered in intensive gold and diamond prospecting, culminating in the discovery of payable gold at farms such as Uitsig and St Helena (1939-1941), which triggered the Free State Goldfields boom and the establishment of Welkom (1947) as a planned mining town. This mining-driven phase significantly shaped settlement patterns, but no surviving heritage structures linked to early mining or colonial activity were recorded within the project footprint.



10 ENVIRONMENTAL IMPACT ASSESSMENT

10.1 IMPACTS IDENTIFIED

This Section presents the impacts that have been identified and assessed for the BA. Potential environmental impacts were identified by the EAP, the appointed specialists (where applicable), as well as the preliminary input from the public. The impacts are included in Table 12.

When considering cumulative impacts, it is important to bear in mind the scale at which different impacts occur. The identification of impacts is an objective iterative process of considering the project components and activities and how these may interact with the different environmental components. An activity/ environmental component matrix is presented in Table 11 below. The matrix represents which environmental components are likely to be impacted upon by the project activities. Table 12 provides a list of the identified impacts associated with each environmental component.



Table 11: Impact identification matrix.

Phase	Activity	Environmental Component							
		Climate and Air Quality (AQ)	Geology and soils (G)	Surface water / wetlands (W)	Noise (N)	Terrestrial Ecology (TE)	Social (S)	Cultural Heritage (C)	Economic (E)
Construction (incl pre-construction and post construction rehab)	Surveying and pegging exact plinth positions	-	-			-			
	Delivery of construction equipment, pipeline segments, and plinths	-	-		-	-			
	Clearance of vegetation (specifically at plinth positions)	-				-		-	
	Levelling of ground for placement of plinths	-	-	-		-		-	
	Placement of plinths		-	-	-	-			
	Lifting and aligning of pipeline segments on plinths (may involve the use of rigging equipment/vehicles)		-		-				
	Constructing engineered ramps over the pipeline at road crossings (instead of trenching).		-		-				
	Additional traffic and movement along pipeline route during construction activities	-			-	-			
	Temporary stormwater and erosion controls		-	-		-			
Normal Operations	Inspection and pressure testing of pipeline		-		-	-			
	Calibration and testing of valves and control systems (potentially at pumpstations)				-				
	Continuous conveyance of return water from RWDs to Dam 13			+			+		+
	Monitoring flow, pressure, leaks, and structural integrity		-		-	-			
	Periodic inspection of plinths, flange bolts, joints, pipeline in general				-	-			
	Maintenance activities (replacement of gaskets, bolt retightening, limited vegetation clearance when and where necessary)		-			-			
	Light vehicles and maintenance teams using existing Harmony roads	-			-				
	Optimisation and subsequent growth of Harmony Free State Operations						+		+
Decommissioning, Rehabilitation and Closure	Drainage of remaining water and flushing of pipeline			-					
	Dismantling and removal of pipeline and associated components		-		-	-			
	Encouraging of natural re-vegetation			+		+			



Table 12: Impacts Identified and Assessed during the BA.

#	Impact	Activity/ Aspect	Phase
AQ1	Minimal generation of dust from levelling of ground, and vehicle movement	Clearance of vegetation Levelling of ground Construction of pipeline and road crossings	Construction
AQ2	Minimal generation of dust from vehicle movement during inspection and maintenance activities	Light vehicles and maintenance teams using existing Harmony roads	Operation
G1	Soil Compaction and Erosion	Surveying and Pegging Clearance of vegetation Levelling of ground Construction of pipeline and road crossings	Construction
G2	Negligible pollution of soils through minor spills from equipment/vehicles on site	Construction of pipeline and road crossings	Construction
G3	Soil Compaction and Erosion	Monitoring and maintenance activities	Operation
G4	Negligible pollution of soils through minor spills from equipment/vehicles on site	Monitoring and maintenance activities	Operation
G5	Soil Compaction and Erosion	Dismantling of infrastructure	Decommissioning
W1	Indirect loss, disturbance and degradation of wetlands	Clearance of vegetation Levelling of ground Construction of pipeline in wetland area	Construction
W2	Increased bare surfaces, runoff and potential for erosion	Clearance of vegetation Levelling of ground	Construction



#	Impact	Activity/ Aspect	Phase
W3	Degradation of wetland vegetation and the introduction and spread of alien and invasive vegetation	Construction of pipeline in wetland area	Construction
W4	Contamination of wetlands with hydrocarbons due to machinery leaks and other waste	Construction of pipeline in wetland area	Construction
W5	Alteration of hydrological regime at drainage feature crossing	Construction of pipeline in wetland area	Construction
W6	Increased dirty/processed water inputs nearby wetlands due to leakage	Monitoring and maintenance activities	Operation
W7	Degradation of wetland vegetation and proliferation of alien and invasive species	Dismantling of infrastructure	Decommissioning
W8	Disruption of wetland soil profile, hydrological regime and increased sediment loads	Dismantling of infrastructure	Decommissioning
N1	Generation of noise through construction activities	Delivery of construction equipment Construction of pipeline and road crossings	Construction
N2	Generation of noise through increased traffic and movement along access route	Delivery of construction equipment Construction of pipeline and road crossings	Construction
N3	Generation of noise through maintenance, inspections, and calibrations	Monitoring and maintenance activities	Operation
N4	Generation of noise through increased traffic and movement along access route	Light vehicles and maintenance teams using existing Harmony roads	Operation
N5	Generation of noise during decommissioning/dismantling/removal of pipeline from site	Dismantling and removal of pipeline and associated components	Decommissioning
TE1	Destruction, further loss and fragmentation of the of habitats, ecosystems and vegetation community	Clearance of vegetation	Construction



#	Impact	Activity/ Aspect	Phase
		Levelling of ground Construction of pipeline in wetland area	
TE2	Introduction of alien and invasive species, especially plants	Clearance of vegetation Levelling of ground Construction of pipeline in wetland area	Construction
TE3	Displacement of faunal community due to habitat loss, direct mortalities and disturbance (road collisions, noise, dust, vibration and poaching)	Clearance of vegetation Levelling of ground Construction of pipeline in wetland area	Construction
TE4	Continued fragmentation and degradation of habitats and ecosystems	Monitoring and maintenance activities Light vehicles and maintenance teams using existing Harmony roads	Operation
TE5	Potential leaks, discharges, pollutants from pipeline and machinery/storage leaching into the surrounding environment.	Monitoring and maintenance activities Light vehicles and maintenance teams using existing Harmony roads	Operation
TE6	Ongoing displacement and direct mortalities of faunal community (including SCC) due to disturbance (road collisions, noise, light, dust, vibration)	Monitoring and maintenance activities	Operation
TE7	Destruction of vegetation, encroachment and displacement of the natural vegetation community and direct mortality of fauna.	Dismantling and removal of pipeline and associated components	Decommissioning
S1	Further development of community through industry growth	Continuous conveyance of return water from RWDs to Dam 13	Operation



#	Impact	Activity/ Aspect	Phase
		Optimisation and subsequent growth of Harmony Free State Operations	
S2	Potential future job creation	Optimisation and subsequent growth of Harmony Free State Operations	Operation
C1	Damage/destruction to unknown archaeological and heritage material	Clearance of vegetation (specifically at plinth positions) Levelling of ground for placement of plinths	Construction
C2	Palaeontology: Loss of Fossil Heritage	Clearance of vegetation (specifically at plinth positions) Levelling of ground for placement of plinths Construction of pipeline and road crossings	Construction
E1	Economic growth through the sustaining and support of Free State mining activities	Continuous conveyance of return water from RWDs to Dam 13 Optimisation and subsequent growth of Harmony Free State Operations	Operation

10.2 IMPACT ASSESSMENT METHODOLOGY

The broad approach to the significance rating methodology is to determine the significance (S) of an environmental risk or impact by considering the consequence (C) of each impact (comprising Nature, Extent, Duration, Magnitude, and Reversibility) and relating this to the probability/ likelihood (P) of the impact occurring. The S is determined for the pre- and post-mitigation scenario. In addition, other factors, including cumulative impacts and potential for irreplaceable loss of resources, are used to determine a prioritisation factor (PF) which is applied to the S to determine the overall final significance rating (FS).

10.2.1 DETERMINATION OF SIGNIFICANCE

The final significance (FS) of an impact or risk is determined by applying a prioritisation factor (PF) to the post-mitigation environmental significance. The significance is dependent on the consequence (C) of the particular



impact and the probability (P) of the impact occurring. Consequence is determined through the consideration of the Nature (N), Extent (E), Duration (D), Magnitude (M), and Reversibility (R) applicable to the specific impact.

For the purpose of this methodology the consequence of the impact is represented by:

$$C = \frac{(E + D + M + R) * N}{4}$$

Each individual aspect in the determination of the consequence is represented by a rating scale as defined in Table 13 below.

Table 13: Criteria for Determining Impact Consequence

Aspect	Score	Definition
Nature	- 1	Likely to result in a negative/ detrimental impact
	+1	Likely to result in a positive/ beneficial impact
Extent	1	Activity (i.e. Highly localised, limited to the area applicable to the specific activity)
	2	Site (i.e. within the development property or site boundary, or the area within a few hundred meters of the site)
	3	Local (i.e. beyond the site boundary within the Local administrative boundary (e.g. Local Municipality) or within consistent local geographical features, or the area within 5 km of the site)
	4	Regional (i.e. Far beyond the site boundary, beyond the Local administrative boundaries within the Regional administrative boundaries (e.g. District Municipality), or extends into different distinct geographical features, or extends between 5 and 50 km from the site).
	5	Provincial / National / International (i.e. extends into numerous distinct geographical features, or extends beyond 50 km from the site).
Duration	1	Immediate (<1 year, quickly reversible)
	2	Short term (1-5 years, less than project lifespan)
	3	Medium term (6-15 years)
	4	Long term (15-65 years, the impact will cease after the operational life span of the project)
	5	Permanent (>65 years, no mitigation measure of natural process will reduce the impact after construction/ operation/ decommissioning).
Magnitude/ Intensity	1	Minor (where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected)
	2	Low (where the impact affects the environment in such a way that natural, cultural and social functions and processes are slightly affected, or affected environmental components are already degraded)
	3	Moderate (where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; moderate improvement)



Aspect	Score	Definition
		for +ve impacts; or where change affects area of potential conservation or other value, or use of resources).
	4	High (where natural, cultural or social functions or processes are altered to the extent that it will temporarily cease; high improvement for +ve impacts; or where change affects high conservation value areas or species of conservation concern)
	5	Very high / don't know (where natural, cultural or social functions or processes are altered to the extent that it will permanently cease, substantial improvement for +ve impacts; or disturbance to pristine areas of critical conservation value or critically endangered species)
Reversibility	1	Impact is reversible without any time and cost.
	2	Impact is reversible without incurring significant time and cost.
	3	Impact is reversible only by incurring significant time and cost.
	4	Impact is reversible only by incurring very high time and cost.
	5	Irreversible Impact.

Once the C has been determined, the significance is determined in accordance with the standard risk assessment relationship by multiplying the C and the P. Probability is rated/ scored as per Table 14.

It is noted that both environmental risks as well as environmental impacts should be identified and assessed. Environmental Risk can be regarded as the potential for something harmful to happen to the environment, and in many instances is not regarded as something that is expected to occur during normal operations or events (e.g. unplanned fuel or oil spills at a construction site). Probability and likelihood are key determinants or variables of environmental risk. Environmental Impact can be regarded as the actual effect or change that happens to the environment because of an activity and is typically an effect that is expected from normal operations or events (e.g. vegetation clearance from site development results in loss of species of concern). Typically, the probability of an unmitigated environmental impact is regarded as highly likely or certain (management and mitigation measures would ideally aim to reduce this likelihood where possible). In summary, environmental risk is about what could happen, while environmental impact is about what does happen.

Table 14: Probability/ Likelihood Scoring

Probability	1	Improbable (Rare, the event may occur only in exceptional circumstances, the possibility of the impact materialising is very low as a result of design, historic experience, or implementation of adequate corrective actions; <5% chance).
	2	Low probability (Unlikely, impact could occur but not realistically expected; >5% and <20% chance).
	3	Medium probability (Possible, the impact may occur; >20% and <50% chance).
	4	High probability (Likely, it is most probable that the impact will occur - > 50 and <90% chance).
	5	Definite (Almost certain, the impact is expected to, or will, occur, >90% chance).

The result is a qualitative representation of relative significance associated with the impact. Significance is therefore calculated as follows:

$$S = C \times P$$

Table 15: Determination of Significance



Consequence	5- Very High ^a	5	10	15	20	25
	4- High	4	8	12	16	20
	3- Medium	3	6	9	12	15
	2- Low	2	4	6	8	10
	1- Very low	1	2	3	4	5
		1- Improbable	2- Low	3- Medium/ Possible	4- High/ Probable	5- Highly likely/ Definite
Probability						

The outcome of the significance assessment will result in a range of scores, ranging from 1 through to 25. These significance scores are then grouped into respective classes as described in Table 16.

Table 16: Significance Scores

S Score	Description
≤4.25	Low (i.e. where this impact is unlikely to be a significant environmental risk/ reward).
>4.25, ≤8.5	Low-Medium (i.e. where the impact could have a significant environmental risk/ reward).
>8.5, ≤13.75	High-Medium (i.e. where the impact could have a significant environmental risk/ reward).
>13.75	High (i.e. where the impact will have a significant environmental risk/ reward).

The impact significance will be determined for each impact without relevant management and mitigation measures (pre-mitigation significance), as well as post implementation of relevant management and mitigation measures (post-mitigation significance). This allows for a prediction in the degree to which the impact can be managed/mitigated.

10.2.2 IMPACT PRIORITIZATION

Further to the assessment criteria presented in the section above, it is necessary to consider each potentially significant impact in terms of:

1. Cumulative impacts; and
2. The degree to which the impact may cause irreplaceable loss of resources.

To ensure that these factors are considered, an impact prioritisation factor (PF) will be applied to each impacts' post-mitigation significance (post-mitigation). This prioritisation factor does not aim to detract from the significance ratings but rather to focus the attention of the decision-making authority on the higher priority/significance issues and impacts. The PF will be applied to the post-mitigation significance based on the assumption that relevant suggested management/mitigation impacts are implemented.

Table 17: Criteria for Determining Prioritisation

^a In the event that an impact or risk has very high or catastrophic consequences, but the likelihood/ probability is low, then the resultant significance would be Low-medium. This does in certain instances detract from the relative important of this impact or risk and must consequently be flagged for further specific consideration, management, mitigation, or contingency planning.



Cumulative Impact (CI)	Low (1)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.
	Medium (2)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact will result in spatial and temporal cumulative change.
	High (3)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is highly probable/ definite that the impact will result in spatial and temporal cumulative change.
Irreplaceable Loss of Resources (LR)	Low (1)	Where the impact is unlikely to result in irreplaceable loss of resources.
	Medium (2)	Where the impact may result in the irreplaceable loss (cannot be replaced or substituted) of resources but the value (services and/or functions) of these resources is limited.
	High (3)	Where the impact may result in the irreplaceable loss of resources of high value (services and/or functions).

The value for the final impact priority is represented as a single consolidated priority, determined as the sum of each individual criteria represented in Table 17. The impact priority is therefore determined as follows:

$$\text{Priority} = CI + LR$$

The result is a priority score which ranges from 2 to 6 and a consequent PF ranging from 1 to 1.5 (Refer to Table 18).

Table 18: Determination of Prioritisation Factor

Priority	Prioritisation Factor
2	1
3	1.125
4	1.25
5	1.375
6	1.5

In order to determine the final impact significance (FS), the PF is multiplied by the post-mitigation significance scoring. The ultimate aim of the PF is an attempt to increase the post mitigation environmental risk rating by a factor of 0.5, if all the priority attributes are high (i.e. if an impact comes out with a high medium environmental risk after the conventional impact rating, but there is significant cumulative impact potential and significant potential for irreplaceable loss of resources, then the net result would be to upscale the impact to a higher significance).



Table 19: Final Environmental Significance Rating

Significance Rating	Description
<-25	Very High (Impacts in this class are extremely significant and pose a very high environmental risk. In certain instances these may represent a fatal flaw. They are likely to have a major influence on the decision and may be difficult or impossible to mitigate. Offset's may be necessary.
<-13.75 to -25	High negative (These impacts are significant and must be carefully considered in the decision-making process. They have a high environmental risk or impact and require extensive mitigation measures).
-8.5 to -13.75	Medium-High negative (i.e. Impacts in this class are more substantial and could have a significant environmental risk. They may influence the decision to develop in the area and require more robust mitigation measures).
<-4.25 to <-8.5	Medium- Low negative (i.e. These impacts are slightly more significant than low impacts but still do not pose a major environmental risk. They might require some mitigation measures but are generally manageable).
-1 to -4.25	Low negative (i.e. Impacts in this class are minor and unlikely to have a significant environmental risk. They do not influence the decision to develop in the area and are typically easily mitigated).
0	No impact
1 to 4.25	Low positive
>4.25 to <8.5	Medium-Low positive
8.5 to 13.75	Medium-High positive
>13.75	High positive

The significance ratings and additional considerations applied to each impact will be used to provide a quantitative comparative assessment of the alternatives being considered. In addition, professional expertise and opinion of the specialists and the environmental consultants will be applied to provide a qualitative comparison of the alternatives under consideration. This process will identify the best alternative for the proposed project.

10.3 DESCRIPTION AND ASSESSMENT OF IMPACTS

This section describes each identified environmental impact in the context of the activity and associated aspect and provides reasons why specific ranking/ rating of the component attributes of the impact assessment are given.

10.3.1 CLIMATE AND AIR QUALITY (AQ)

The main impact the proposed project will have on air quality will be dust generation and the minimal emissions from vehicles on site during construction and operation (AQ1 and AQ2). These impacts were rated to be Low negative, both pre- and post-mitigation. Nevertheless, mitigations have been proposed to minimise the impacts.



10.3.1.1 MINIMAL GENERATION OF DUST AND VEHICLE EMISSIONS FROM LEVELLING OF GROUND, AND VEHICLE MOVEMENT (AQ1) - CONSTRUCTION

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Minimal generation of dust and vehicle emissions from levelling of ground, and vehicle movement (AQ1)	Construction	Low -	Low -	Low -
Potential cumulative/confounding effects	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.			
Alternatives	The construction of the pipeline above-ground as opposed to underground is considered here as the best possible alternative. Hence, no other alternatives have been considered better in reducing the identified impacts.			
Mitigation Measures				
<ul style="list-style-type: none"> • Reduce the dust generated by operational vehicles and earth moving machinery under enforced speed limits reducing the probability and magnitude of dust generation. • Restrict vegetation removal to earmarked and pegged plinth locations to a limit of 2 meters from the pegged location 				

10.3.1.2 MINIMAL GENERATION OF DUST AND EMISSIONS FROM VEHICLE MOVEMENT DURING INSPECTION AND MAINTENANCE ACTIVITIES (AQ2) - OPERATION

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Minimal generation of dust and emissions from vehicle movement during inspection and maintenance activities (AQ2)	Operation	Low -	Low -	Low -
Potential cumulative/confounding effects	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.			
Alternatives	The construction of the pipeline above-ground as opposed to underground is considered here as the best possible alternative. Hence, no other alternatives have been considered better in reducing the identified impacts.			



Mitigation Measures
<ul style="list-style-type: none"> Reduce the dust generated by operational vehicles and earth moving machinery under enforced speed limits reducing the probability and magnitude of dust generation.

10.3.2 GEOLOGY AND SOILS (G)

Two key impacts on geology and soils were identified. These impacts are expected to be associated with the different phases of development of the project yet have a similar level of impact. These impacts are namely, the impact of construction, operational, and decommissioning activities on soil compaction and erosion (G1, G2, G3), as well as the negligible pollution of soils through minor spills from equipment/vehicles on site expected during construction and operation mainly (G2 and G4). These impacts are rated as no more than Medium to low negative pre-mitigation, and Low negative post-mitigation.

10.3.2.1 SOIL COMPACTION AND EROSION (G1, G3, G5) – CONSTRUCTION, OPERATION, AND DECOMMISSIONING

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Soil Compaction and Erosion (G1)	Construction	Medium to low -	Low -	Low -
Soil Compaction and Erosion (G3)	Operation	Medium to low -	Low -	Low -
Soil Compaction and Erosion (G5)	Decommissioning	Medium to low -	Low -	Low -
Potential cumulative/ confounding effects	The cumulative impacts of the preferred method of mitigation are rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.			
Alternatives	The construction of the pipeline above-ground as opposed to underground is considered here as the best possible alternative. Hence, no other alternatives have been considered better in reducing the identified impacts.			
Mitigation Measures				
<ul style="list-style-type: none"> Dust suppressions methods (where reasonably applicable, for instance where visible dust is noticeable or depending on wind conditions) should be implemented to reduce wind erosion. This may include the application of water to active work areas (plinth positions and short cleared sections) using a water bowser or portable tank sprayer. Install erosion and sediment control measures where deemed imperative. This may include the installation of silt fences and temporary berms. Decompact soils which are observed to have been affected by heavy machinery – the discretion of the EO and ECO is to guide the implementation of this mitigation where and when deemed necessary. 				



10.3.2.2 NEGLIGIBLE POLLUTION OF SOILS THROUGH MINOR SPILLS FROM EQUIPMENT/VEHICLES ON SITE (G2 AND G4) – CONSTRUCTION AND OPERATION

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Negligible pollution of soils through minor spills from equipment/vehicles on site (G2)	Construction	Low -	Low -	Low -
Negligible pollution of soils through minor spills from equipment/vehicles on site (G4)	Operation	Low -	Low -	Low -
Potential cumulative/confounding effects	The cumulative impacts of the preferred method of mitigation are rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.			
Alternatives	The construction of the pipeline above-ground as opposed to underground is considered here as the best possible alternative. Hence, no other alternatives have been considered better in reducing the identified impacts.			
Mitigation Measures				
<ul style="list-style-type: none"> • Harmony’s standard hydrocarbon spill management plan is to be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. • Inspect vehicles and machinery on a daily basis for fuel and oil leakages and repair such, although no servicing of equipment on site. • Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. This is considering that most vehicles will not be stationary during construction as no lay-down areas will form part of construction activities. 				

10.3.3 SURFACE WATER/ WETLANDS (W)

A wetlands and aquatics assessment was conducted as part of this Basic Assessment. The following was highlighted in the report attached in APPENDIX E:

“The development of the proposed return water pipeline will result in localised modification of watercourse habitats, particularly where construction activities occur in proximity to the mapped depression wetland (HGM 1) and at the single crossing of the low sensitivity drainage feature. Vegetation clearance, soil stripping for plinth placement, and the use of access track may concentrate runoff, creating erosion hotspots and promoting the delivery of sediment and contaminants to receiving watercourses. Although the pipeline has been aligned to avoid direct intrusion into the depression wetland and its 15 m buffer, infrastructure located upslope or on suitable slopes could create preferential flow paths, thereby increasing surface runoff volumes and velocities and, if poorly managed, contributing to localised channel instability and degradation of wetland habitat and ecosystem services.”



Impacts on surface water and wetlands have been divided into 8 distinct impacts related to the different phases of development. These impacts include:

- Indirect loss, disturbance and degradation of wetlands (W1) - Construction
- Increased bare surfaces, runoff and potential for erosion (W2) - Construction
- Degradation of wetland vegetation and the introduction and spread of alien and invasive vegetation (W3) - Construction
- Contamination of wetlands with hydrocarbons due to machinery leaks and other waste (W4) - Construction
- Alteration of hydrological regime at drainage feature crossing (W5) - Construction
- Increased dirty/processed water inputs nearby wetlands due to leakage (W6) - Operation
- Degradation of wetland vegetation and proliferation of alien and invasive species (W7) - Decommissioning
- Disruption of wetland soil profile, hydrological regime and increased sediment loads (W8) – Decommissioning

As highlighted in the quotation from the specialist report, several of the impacts described above are interrelated. The project is linked to several impacts associated with the wetland areas it traverses and the ecosystems thereof (W1, W3, W4, W6, W7, and W8). The project is also linked to changes in natural surface water flows and hydrological regimes (W2 and W5). These impacts are all rated as Medium to low negative pre-mitigation, and Low negative post-mitigation.

10.3.3.1 INDIRECT LOSS, DISTURBANCE AND DEGRADATION OF WETLANDS (W1) - CONSTRUCTION

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Indirect loss, disturbance and degradation of wetlands (W1)	Construction	Medium to low -	Low -	Low -
Potential cumulative/confounding effects	Although the pipeline has been aligned to avoid direct intrusion into the depression wetland and its 15 m buffer, infrastructure located upslope or on suitable slopes could create preferential flow paths, thereby increasing surface runoff volumes and velocities and, if poorly managed, contributing to localised channel instability and degradation of wetland habitat and ecosystem services.			
Alternatives	As an embedded alternative (or alternative pre-contemplated which has subsequently affected the design of the pipeline), the pipeline avoids the identified wetland areas, but traverses the 500m (depression wetlands) and 100m (drainage line) ZoR.			
Mitigation Measures				
<ul style="list-style-type: none"> • Minimise the construction footprint and restrict vegetation clearing to the demarcated pipeline servitude and work areas. • Rehabilitate any unavoidable disturbance within the drainage feature or wetland buffer by reshaping to a stable profile and re-vegetating with appropriate species. • Limit vehicle and machinery movement near the wetland and drainage feature to existing tracks and clearly designated routes. 				



- Limit all other activities within or adjacent to the drainage feature and wetland buffers to those explicitly authorised.
- At the drainage line crossing, install the pipeline above ground so that it spans the active channel, with supports located outside the active bed wherever feasible.

10.3.3.2 INCREASED BARE SURFACES, RUNOFF AND POTENTIAL FOR EROSION (W2) - CONSTRUCTION

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Increased bare surfaces, runoff and potential for erosion (W2)	Construction	Medium to low -	Low -	Low -
Potential cumulative/confounding effects	Although the pipeline has been aligned to avoid direct intrusion into the depression wetland and its 15 m buffer, infrastructure located upslope or on suitable slopes could create preferential flow paths, thereby increasing surface runoff volumes and velocities and, if poorly managed, contributing to localised channel instability and degradation of wetland habitat and ecosystem services.			
Alternatives	As an embedded alternative (or alternative pre-contemplated which has subsequently affected the design of the pipeline), the pipeline avoids the identified wetland areas, but traverses the 500m (depression wetlands) and 100m (drainage line) ZoR.			
Mitigation Measures				
<ul style="list-style-type: none"> • Maintain and, where necessary, improve existing access roads and tracks to prevent rutting, erosion and uncontrolled runoff. • Where excavation is required near the drainage feature, strip and stockpile topsoil and subsoil separately on a flat area outside the channel, protected from rain and runoff; reinstate soils in the original order once works are complete. • Implement and maintain construction phase stormwater controls (e.g. diversion berms, contour banks, silt fences) to route clean water around disturbed areas and prevent concentrated flows towards the drainage feature and wetlands. 				

10.3.3.3 DEGRADATION OF WETLAND VEGETATION AND THE INTRODUCTION AND SPREAD OF ALIEN AND INVASIVE VEGETATION (W3) - CONSTRUCTION

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Degradation of wetland vegetation and the introduction and spread of alien and invasive vegetation (W3)	Construction	Medium to low -	Low -	Low -
Potential cumulative/confounding effects	Although the pipeline has been aligned to avoid direct intrusion into the depression wetland and its 15 m buffer, infrastructure located upslope or on suitable slopes could create preferential flow paths, thereby increasing surface runoff volumes and velocities and, if poorly managed, contributing to localised channel instability and degradation of wetland habitat and ecosystem services.			



Alternatives	As an embedded alternative (or alternative pre-contemplated which has subsequently affected the design of the pipeline), the pipeline avoids the identified wetland areas, but traverses the 500m (depression wetlands) and 100m (drainage line) ZoR.
Mitigation Measures	
<ul style="list-style-type: none"> • Monitor disturbed areas along the pipeline servitude, drainage feature and wetland buffers for alien and invasive plant establishment and remove such plants using mechanical methods. • Minimise the construction footprint and restrict vegetation clearing to the designated work areas. • Rehabilitate disturbed areas near the drainage feature and wetland buffers by replacing stored topsoil, reshaping to natural contours and re-vegetating with appropriate indigenous species or suitable pasture mix, as agreed with the landowner. 	

10.3.3.4 CONTAMINATION OF WETLANDS WITH HYDROCARBONS DUE TO MACHINERY LEAKS AND OTHER WASTE (W4) - CONSTRUCTION

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Contamination of wetlands with hydrocarbons due to machinery leaks and other waste (W4)	Construction	Medium to low -	Low -	Low -
Potential cumulative/ confounding effects	Although the pipeline has been aligned to avoid direct intrusion into the depression wetland and its 15 m buffer, infrastructure located upslope or on suitable slopes could create preferential flow paths, thereby increasing surface runoff volumes and velocities and, if poorly managed, contributing to localised channel instability and degradation of wetland habitat and ecosystem services.			
Alternatives	As an embedded alternative (or alternative pre-contemplated which has subsequently affected the design of the pipeline), the pipeline avoids the identified wetland areas, but traverses the 500m (depression wetlands) and 100m (drainage line) ZoR.			
Mitigation Measures				
<ul style="list-style-type: none"> • Prohibit fuel handling, vehicle maintenance, chemical mixing and concrete batching within the drainage feature or wetland buffers; undertake these activities only in designated, bunded areas away from freshwater features. • Store fuels, oils, chemicals and other hazardous substances in properly bunded and covered areas; regularly inspect and maintain bunds, drip trays and storage facilities. • Ensure all solid and hazardous waste is stored in designated, impermeable areas and removed regularly to licensed disposal facilities; no dumping or burning of waste on site. • Prevent any waste or litter from accumulating near the wetland or drainage feature and clean up wind-blown litter promptly. • Ensure that dirty water from construction areas is collected and directed to appropriate containment (e.g. existing pollution control dams) rather than discharged to the drainage feature or wetlands. 				



- Develop and implement an emergency response procedure for spills and leaks, including immediate containment, clean up and reporting.

10.3.3.5 ALTERATION OF HYDROLOGICAL REGIME AT DRAINAGE FEATURE CROSSING (W5) - CONSTRUCTION

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Alteration of hydrological regime at drainage feature crossing (W5)	Construction	Medium to low -	Low -	Low -
Potential cumulative/confounding effects	Although the pipeline has been aligned to avoid direct intrusion into the depression wetland and its 15 m buffer, infrastructure located upslope or on suitable slopes could create preferential flow paths, thereby increasing surface runoff volumes and velocities and, if poorly managed, contributing to localised channel instability and degradation of wetland habitat and ecosystem services.			
Alternatives	As an embedded alternative (or alternative pre-contemplated which has subsequently affected the design of the pipeline), the pipeline avoids the identified wetland areas, but traverses the 500m (depression wetlands) and 100m (drainage line) ZoR.			
Mitigation Measures				
<ul style="list-style-type: none"> • At the drainage line crossing, install the pipeline above ground so that it spans the active channel, with supports located outside the active bed and banks wherever feasible, to avoid impeding flows. • Avoid any unnecessary excavation, infilling or shaping within the drainage channel; where work within the banks is unavoidable, restore the channel profile and stabilise disturbed banks with appropriate erosion control measures and vegetation. • Restrict all other construction activities within or immediately adjacent to the drainage feature to those explicitly authorised and necessary for the pipeline crossing. 				

10.3.3.6 INCREASED DIRTY/PROCESSED WATER INPUTS NEARBY WETLANDS DUE TO LEAKAGE (W6) – OPERATION

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Increased dirty/processed water inputs nearby wetlands due to leakage (W6)	Operation	Medium to low -	Low -	Low -
Potential cumulative/confounding effects	Although the pipeline has been aligned to avoid direct intrusion into the depression wetland and its 15 m buffer, infrastructure located upslope or on suitable slopes could create preferential flow paths, thereby increasing surface runoff volumes and velocities and, if poorly managed, contributing to localised channel instability and degradation of wetland habitat and ecosystem services.			
Alternatives	As an embedded alternative (or alternative pre-contemplated which has subsequently affected the design of the pipeline), the pipeline avoids the			



	identified wetland areas, but traverses the 500m (depression wetlands) and 100m (drainage line) ZoR.
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Mitigation Measures

- Implement and maintain an operational stormwater management system so that clean runoff is diverted away from the pipeline servitude, valve chambers and low points, and any potentially contaminated water is directed to existing pollution control facilities (e.g. PCDs / RWDs) for treatment.
- Undertake routine inspections and maintenance of the pipeline (including joints, valves, air release points and anchor blocks) to detect corrosion, leaks or pressure drops early and to ensure timely repair.
- Install and test leak detection and pressure monitoring systems where practicable, with clear trigger levels for investigation and shut off.
- Ensure all operational staff are trained in the pipeline emergency response procedure, including immediate isolation/shut down of leaking sections, containment of released water and clean-up of affected areas.
- After any leak event, inspect the nearby drainage feature and wetlands for signs of contamination or erosion and implement remedial rehabilitation where required.

10.3.3.7 DEGRADATION OF WETLAND VEGETATION AND PROLIFERATION OF ALIEN AND INVASIVE SPECIES (W7) - DECOMMISSIONING

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Degradation of wetland vegetation and proliferation of alien and invasive species (W7)	Decommissioning	Medium to low -	Low -	Low -
Potential cumulative/ confounding effects	Although the pipeline has been aligned to avoid direct intrusion into the depression wetland and its 15 m buffer, infrastructure located upslope or on suitable slopes could create preferential flow paths, thereby increasing surface runoff volumes and velocities and, if poorly managed, contributing to localised channel instability and degradation of wetland habitat and ecosystem services.			
Alternatives	As an embedded alternative (or alternative pre-contemplated which has subsequently affected the design of the pipeline), the pipeline avoids the identified wetland areas, but traverses the 500m (depression wetlands) and 100m (drainage line) ZoR.			
Mitigation Measures				
<ul style="list-style-type: none"> • Plan decommissioning so that works near the drainage feature and within wetland buffers take place, as far as possible, during the dry season to minimise disturbance and rutting. • Restrict decommissioning activities to the demarcated servitude and existing access routes; avoid encroachment into the mapped depression wetland and its 15 m buffer. • Following removal of the pipeline and plinths, re-profile disturbed ground to blend with surrounding topography, replace stored topsoil and re-vegetate promptly with appropriate indigenous species or landowner approved pasture mix. 				



- Monitor all disturbed areas along the former servitude, particularly near the drainage feature and HGM 1, for alien and invasive plant establishment, and remove such species using mechanical methods on an ongoing basis until vegetation cover is stable.
- Avoid the routine use of herbicides within or immediately adjacent to wetlands and the drainage feature; where chemical control is unavoidable, apply targeted, spot treatment methods under the supervision of the Environmental Control Officer.

10.3.3.8 DISRUPTION OF WETLAND SOIL PROFILE, HYDROLOGICAL REGIME AND INCREASED SEDIMENT LOADS (W8) - DECOMMISSIONING

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Disruption of wetland soil profile, hydrological regime and increased sediment loads (W8)	Decommissioning	Medium to low -	Low -	Low -
Potential cumulative/confounding effects	Although the pipeline has been aligned to avoid direct intrusion into the depression wetland and its 15 m buffer, infrastructure located upslope or on suitable slopes could create preferential flow paths, thereby increasing surface runoff volumes and velocities and, if poorly managed, contributing to localised channel instability and degradation of wetland habitat and ecosystem services.			
Alternatives	As an embedded alternative (or alternative pre-contemplated which has subsequently affected the design of the pipeline), the pipeline avoids the identified wetland areas, but traverses the 500m (depression wetlands) and 100m (drainage line) ZoR.			
Mitigation Measures				
<ul style="list-style-type: none"> • Design the decommissioning method so that the active bed and banks of the drainage feature are disturbed as little as practicable; where feasible, leave below ground foundations in place if their removal would cause greater instability. • Where removal of plinths or foundations near the drainage feature is required, strip and stockpile topsoil and subsoil separately on a stable area outside the channel and wetland buffers, protected from runoff and wind. • After removal, reinstate the original soil profile in the correct order, re-shape any worked sections of the drainage feature or banks to stable, pre-disturbance contours, and stabilise with appropriate erosion control measures (e.g. brush packing, rock armouring, biodegradable mats) and vegetation. • Implement temporary erosion and sediment control structures (e.g. silt fences, small berms, straw bales) downslope of disturbed areas and along access routes until soils have stabilised and vegetation has re-established. • Maintain and, where necessary, rehabilitate access roads used for decommissioning to prevent ongoing erosion and sediment delivery to the drainage feature and wetlands. • Conduct follow up inspections after significant rainfall events during the first wet season post-decommissioning and repair any emerging erosion or instability promptly. 				



10.3.4 NOISE (N)

As an overall impact, the project is expected to be a source of additional noise during construction, operation, and decommissioning. Some sources of noise are expected to include, construction activities (N1), increased traffic on access routes during construction and operation (N2, N4), noise emanating from maintenance and inspection activities (N3), and noise during the decommissioning, dismantling, and removal of the pipeline from site (N5). Noise receptors contemplated mainly include the surrounding Harmony operations which also generate noise. Although limited, these impacts were rated to be Medium to Low negative pre-mitigation, and Low post-mitigation.

10.3.4.1 GENERATION OF NOISE THROUGH CONSTRUCTION ACTIVITIES (N1) – CONSTRUCTION

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Generation of noise through construction activities (N1)	Construction	Medium to low -	Low -	Low -
Potential cumulative/confounding effects	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.			
Alternatives	As an embedded alternative (or alternative pre-contemplated which has subsequently affected the design of the pipeline), the pipeline would be constructed near existing Harmony operations, which generate their own noise.			
Mitigation Measures				
<ul style="list-style-type: none"> • Make use of well-maintained machinery (e.g. well-oiled, without any worn-out bearings, etc.) where applicable to minimise noise output. • Mufflers and or silencers are recommended where possible to be used with machinery which have high noise outputs. • Limit noisy activities to daytime hours (e.g. 06:00-17:00) and schedule high-noise tasks strategically so that noise generation from different sources do not overlap. 				

10.3.4.2 GENERATION OF NOISE THROUGH INCREASED TRAFFIC AND MOVEMENT ALONG ACCESS ROUTE (N2) – CONSTRUCTION

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Generation of noise through increased traffic and movement along access route (N2)	Construction	Medium to low -	Low -	Low -
Potential cumulative/confounding effects	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.			



Alternatives	As an embedded alternative (or alternative pre-contemplated which has subsequently affected the design of the pipeline), the pipeline would be constructed near existing Harmony operations, which generate their own noise.
Mitigation Measures	
<ul style="list-style-type: none"> • Enforce strict speed limits on all access roads. • Restrict heavy vehicle movements to established Harmony routes. • Avoid unnecessary use of hooters and over-revving where applicable. 	

10.3.4.3 GENERATION OF NOISE THROUGH MAINTENANCE, INSPECTIONS, AND CALIBRATIONS (N3) – OPERATION

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Generation of noise through maintenance, inspections, and calibrations (N3)	Construction	Medium to low -	Low -	Low -
Potential cumulative/confounding effects	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.			
Alternatives	As an embedded alternative (or alternative pre-contemplated which has subsequently affected the design of the pipeline), the pipeline would be constructed near existing Harmony operations, which generate their own noise.			
Mitigation Measures				
<ul style="list-style-type: none"> • Make use of well-maintained machinery (e.g. well-oiled, without any worn-out bearings, etc.) where applicable to minimise noise output. • Mufflers and or silencers are recommended where possible to be used with machinery which have high noise outputs. • Limit noisy activities to daytime hours (e.g. 06:00-17:00) and schedule high-noise tasks strategically so that noise generation from different sources do not overlap. 				

10.3.4.4 GENERATION OF NOISE THROUGH INCREASED TRAFFIC AND MOVEMENT ALONG ACCESS ROUTE (N4)

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Generation of noise through increased traffic and movement along access route (N4)	Construction	Medium to low -	Low -	Low -



Potential cumulative/ confounding effects	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.
Alternatives	As an embedded alternative (or alternative pre-contemplated which has subsequently affected the design of the pipeline), the pipeline would be constructed near existing Harmony operations, which generate their own noise.
Mitigation Measures	
<ul style="list-style-type: none"> • Enforce strict speed limits on all access roads. • Restrict heavy vehicle movements to established Harmony routes. • Avoid unnecessary use of hooters and over-revving where applicable. 	

10.3.4.5 GENERATION OF NOISE DURING DECOMMISSIONING/DISMANTLING/REMOVAL OF PIPELINE FROM SITE (N5) – DECOMMISSIONING

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Generation of noise during decommissioning/dismantling/removal of pipeline from site (N5)	Construction	Medium to low -	Low -	Low -
Potential cumulative/ confounding effects	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.			
Alternatives	As an embedded alternative (or alternative pre-contemplated which has subsequently affected the design of the pipeline), the pipeline would be constructed near existing Harmony operations, which generate their own noise.			
Mitigation Measures				
<ul style="list-style-type: none"> • Make use of well-maintained machinery (e.g. well-oiled, without any worn-out bearings, etc.) where applicable to minimise noise output. • Mufflers and or silencers are recommended where possible to be used with machinery which have high noise outputs. • Limit noisy activities to daytime hours (e.g. 06:00-17:00) and schedule high-noise tasks strategically so that noise generation from different sources do not overlap. 				

10.3.5 TERRESTRIAL ECOLOGY (TE)

The proposed activities will result in limited terrestrial ecological impacts, primarily due to the already highly disturbed condition of habitats along the pipeline route. Construction-related vegetation clearing, soil disturbance and vehicle movement may cause the loss and further degradation of indigenous habitats, including fragmentation and secondary effects such as the spread of alien invasive plants. Disturbance from machinery



and human presence may also lead to the displacement or direct mortality of common fauna, although no Species of Conservation Concern are expected to occur within the project area. During operation, ongoing movement along access routes and maintenance activities may continue to contribute to habitat degradation, alien invasive plant (AIP) encroachment and subtle edge effects, particularly within degraded grassland and modified areas. It is also noted that the highest pre-mitigation rating among these impacts is High negative, with all the rest being Medium to high negative. With careful mitigation, and the implementation of specialists' recommendations, post-mitigation ratings drop to Medium to low negative.

10.3.5.1 DESTRUCTION, FURTHER LOSS AND FRAGMENTATION OF THE OF HABITATS, ECOSYSTEMS AND VEGETATION COMMUNITY (TE1) – CONSTRUCTION

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Destruction, further loss and fragmentation of the of habitats, ecosystems and vegetation community (TE1)	Construction	Medium to high -	Medium to low -	Medium to low -
Potential cumulative/confounding effects	<p>Localised cumulative impacts include those from operations that are close enough to potentially cause additive effects on the local environment or any sensitive receivers. Relevant activities and impacts include fragmentation, dust deposition and disruption of corridors or habitat.</p> <p>Long-term cumulative impacts associated with the site development activities can lead to the loss of endemic and threatened species, including natural habitat and vegetation types, and these impacts can even lead to the degradation of ecosystems and habitats.</p>			
Alternatives	<p>As a key embedded alternative (or alternative pre-contemplated which has subsequently affected the design of the pipeline), the pipeline is planned to traverse already-disturbed areas which minimises ecological impacts.</p>			
Mitigation Measures				
<ul style="list-style-type: none"> • Access control: Use only authorised access routes. Prohibit informal tracks and short-cuts, particularly near wetlands/riparian zones and grassland remnants. • Phased works: Phase construction and earthworks to limit open, exposed areas at any time. Stabilise and rehabilitate completed sections progressively to reduce erosion and dust. • Minimise clearing in natural habitats: In Grassland patches, limit clearing to what is strictly necessary. The Modified habitat (active/historic mining and illegal mining disturbance) should be prioritised for siting ancillary infrastructure to avoid additional loss elsewhere. • Indigenous plant salvage: Prior to clearing, implement a search-and-rescue in accessible natural habitat areas. Translocate suitable salvaged plants and use them, along with brush-packing from indigenous material, in rehabilitation of verges and non-operational batters. • No protected/SCC flora were recorded on site, but it is possible that some may be encountered at a later stage. Permits should be obtained from relevant provincial permits before any removal/relocation of protected plants, where encountered within the authorised footprint. Mark known individuals with high-visibility flagging and establish micro no-go buffers. Where practicable, micro-site infrastructure to avoid them; where not, implement permitted removal/relocation in consultation with a botanist. 				



- Awareness: Include the presence and sensitivity of protected flora in environmental induction and toolbox talks (without disclosing sensitive locations publicly).
- ECO oversight: Appoint an independent Environmental Control Officer to verify demarcations, oversee clearing, check topsoil salvage, inspect water resource buffers, and audit AIP controls.

10.3.5.2 INTRODUCTION OF ALIEN AND INVASIVE SPECIES, ESPECIALLY PLANTS (TE2) – CONSTRUCTION

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Introduction of alien and invasive species, especially plants (TE2)	Construction	Medium to high -	Medium to low -	Medium to low -
Potential cumulative/confounding effects	<p>Localised cumulative impacts include those from operations that are close enough to potentially cause additive effects on the local environment or any sensitive receivers. Relevant activities and impacts include fragmentation, dust deposition and disruption of corridors or habitat.</p> <p>Long-term cumulative impacts associated with the site development activities can lead to the loss of endemic and threatened species, including natural habitat and vegetation types, and these impacts can even lead to the degradation of ecosystems and habitats.</p>			
Alternatives	As a key embedded alternative (or alternative pre-contemplated which has subsequently affected the design of the pipeline), the pipeline is planned to traverse already-disturbed areas which minimises ecological impacts.			
Mitigation Measures				
<ul style="list-style-type: none"> • Require contractor method statements for vegetation clearing, topsoil handling, wetland crossings, stormwater management, batching, and AIP control. • AIP Management Plan: Compile and implement from the onset, with clear treatment prescriptions by habitat and species category (per NEM:BA AIS Lists), seasonal scheduling, and follow-up frequencies. • Integration with method statements: Incorporate AIP controls into contractor method statements for vegetation clearing, topsoil handling, stormwater, and rehabilitation. The ECO to verify implementation. • Fire management interface: Prepare a Fire Risk and Response Plan that prohibits uncontrolled burns; define hot-work permits and fire-break maintenance without scalping soils. Fire can facilitate AIP spread—use mechanical/chemical control instead of burning for AIPs. • Clean works: Require all earthmoving and transport equipment to arrive on site clean (free of soil/seed/mud). Establish a designated wash-down area at site entry for high-risk plant, with sediment capture and disposal. Keep records of inspections. • Clean materials: Source topsoil and fill only from approved on-site stockpiles or vetted suppliers. Prohibit import of soil, mulch, hay, or straw with seed contamination. Certify seed mixes (for rehabilitation) as weed-free and locally appropriate. • Phased clearing: Minimise the area and duration of exposed soils. Immediately stabilise non-operational embankments/verges and topsoil stockpiles to reduce dust and colonisation by AIPs. • Edge hygiene: Demarcate no-go buffers around Water Resources and grassland remnants; prevent parking, spoil placement, and stockpiles on these edges where AIPs typically establish. 				



- Rapid re-vegetation: Immediately re-vegetate stabilised areas with locally appropriate grass mixes and brush-packing using indigenous trimmings to outcompete AIPs.
- Seedbank suppression: In areas previously dominated by AIPs, consider temporary nurse cover (fast-establishing indigenous grasses) to suppress AIP re-emergence; avoid species with invasive potential.
- Herbicide stewardship: Use only registered herbicides, correct timing and doses, with drift control and no spraying in windy conditions or within water resource buffers unless specifically approved and supervised.

10.3.5.3 DISPLACEMENT OF FAUNAL COMMUNITY DUE TO HABITAT LOSS, DIRECT MORTALITIES AND DISTURBANCE (ROAD COLLISIONS, NOISE, DUST, VIBRATION AND POACHING) (TE3) – CONSTRUCTION

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Displacement of faunal community due to habitat loss, direct mortalities and disturbance (road collisions, noise, dust, vibration and poaching) (TE3)	Construction	Medium to high -	Medium to low -	Medium to low -
Potential cumulative/confounding effects	<p>Localised cumulative impacts include those from operations that are close enough to potentially cause additive effects on the local environment or any sensitive receivers. Relevant activities and impacts include fragmentation, dust deposition and disruption of corridors or habitat.</p> <p>Long-term cumulative impacts associated with the site development activities can lead to the loss of endemic and threatened species, including natural habitat and vegetation types, and these impacts can even lead to the degradation of ecosystems and habitats.</p>			
Alternatives	As a key embedded alternative (or alternative pre-contemplated which has subsequently affected the design of the pipeline), the pipeline is planned to traverse already-disturbed areas which minimises ecological impacts.			
Mitigation Measures				
<ul style="list-style-type: none"> • Phased clearing: Clear vegetation and strip soils in small, sequential sections rather than across large areas, prioritising Modified habitat first. This allows fauna to move into adjacent undisturbed areas and reduces exposure time. • Minimise lag: Limit the time between clearing and subsequent construction to prevent fauna reoccupying disturbed areas. • Pre-clearing sweeps: Immediately before clearing, conduct pedestrian sweeps to flush fauna. Keep disturbance tightly time-coupled to clearing to avoid unnecessary stress. • Wildlife handling: Any fauna at risk to be removed by a competent environmental officer or specialist. Keep appropriate handling/containment equipment on site; record relocations. 				



- Site speed limits: Max 40 km/h on construction roads; max 20 km/h at night. Install speed control signage and speed-calming where needed. (Consider this recommendation in conjunction with other mitigations requiring speed limitation)
- Driving protocol: Restrict night driving to essential activities only; enforce designated access routes; prohibit off-road driving.
- Noise management: Maintain equipment; position high-noise activities away from remaining natural habitat edges where feasible; avoid unnecessary hooting and idling.
- Lighting: Avoid floodlighting; use downward-directed, shielded, warm-spectrum lights; keep lights off when not needed; avoid lighting toward Water Resources and grassland remnants.
- Dust suppression: Water haul roads and exposed surfaces to reduce dust; avoid runoff into wetlands; avoid excessive suppression that creates mud traps for fauna.
- Zero tolerance: Prohibit hunting, trapping, persecution, or collection of fauna. Confiscate snares if found; report incidents. Include specific awareness regarding persecution of nocturnal birds and small carnivores.
- Pets and firearms: No pets or unauthorized firearms on site.
- Remove temporary infrastructure (temporary fencing, batching pads) and rehabilitate disturbed areas progressively, not only at end of construction, using salvaged topsoil and appropriate seed mixes to restore cover and reduce future disturbance to fauna.

10.3.5.4 **CONTINUED FRAGMENTATION AND DEGRADATION OF HABITATS AND ECOSYSTEMS (TE4) - OPERATION**

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Continued fragmentation and degradation of habitats and ecosystems (TE4)	Operation	Medium to high -	Medium to low -	Medium to low -
Potential cumulative/ confounding effects	<p>Localised cumulative impacts include those from operations that are close enough to potentially cause additive effects on the local environment or any sensitive receivers. Relevant activities and impacts include fragmentation, dust deposition and disruption of corridors or habitat.</p> <p>Long-term cumulative impacts associated with the site development activities can lead to the loss of endemic and threatened species, including natural habitat and vegetation types, and these impacts can even lead to the degradation of ecosystems and habitats.</p>			
Alternatives	As a key embedded alternative (or alternative pre-contemplated which has subsequently affected the design of the pipeline), the pipeline is planned to traverse already-disturbed areas which minimises ecological impacts.			
Mitigation Measures				
<ul style="list-style-type: none"> • Stay within authorised footprint: Restrict all operational activities, maintenance, and ad hoc laydowns to the approved footprint. No expansion into surrounding areas without prior authorisation. • Prevent contamination and siltation through diligent pipeline maintenance and RWD integrity checks; respond immediately to leaks/overflows. 				



- Implement and maintain stormwater plan: Keep clean/dirty water systems functional; route dirty water to the return-water dam (RWD)(as planned as part of the purpose of the pipeline). Inspect after rainfall and repair promptly.
- Edge protection: Install/maintain berms, silt fences, and rock-lined outfalls at the interface with Water Resources and natural grassland to prevent sediment encroachment.
- Erosion response: Repair rills/gullies on access road verges, and along pipelines immediately using appropriate erosion-control measures (e.g., armouring, brush-packing, hydroseeding). Re-vegetate disturbed edges with locally appropriate indigenous grasses.
- Road dust: Apply water carts or approved suppressants on haul/access roads; maintain road surfaces and drainage to prevent ponding and blowouts. Avoid over-wetting near wetland buffers.
- Ongoing re-vegetation: Re-vegetate bare areas on embankments, verges, and decommissioned temporary areas using locally appropriate indigenous grass mixes and salvaged topsoil where available.
- Brush-packing: Use brush-packing with indigenous trimmings on steep or wind-prone faces to aid soil stability and suppress AIPs.
- Maintenance planning: Schedule routine maintenance (road grading, pipeline repairs) to minimise repeated disturbance in the same area; rehabilitate immediately post-maintenance.

10.3.5.5 POTENTIAL LEAKS, DISCHARGES, POLLUTANTS FROM PIPELINE AND MACHINERY/STORAGE LEACHING INTO THE SURROUNDING ENVIRONMENT (TE5) - OPERATION

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Potential leaks, discharges, pollutants from pipeline and machinery/storage leaching into the surrounding environment (TE5)	Operation	High -	Medium to low -	Medium to low -
Potential cumulative/ confounding effects	<p>Localised cumulative impacts include those from operations that are close enough to potentially cause additive effects on the local environment or any sensitive receivers. Relevant activities and impacts include fragmentation, dust deposition and disruption of corridors or habitat.</p> <p>Long-term cumulative impacts associated with the site development activities can lead to the loss of endemic and threatened species, including natural habitat and vegetation types, and these impacts can even lead to the degradation of ecosystems and habitats.</p>			
Alternatives	<p>As a key embedded alternative (or alternative pre-contemplated which has subsequently affected the design of the pipeline), the pipeline is planned to traverse already-disturbed areas which minimises ecological impacts.</p>			
Mitigation Measures				
<ul style="list-style-type: none"> • Designate and demarcate banded, roofed storage areas for all fuels, oils, and chemicals, located outside of water resource buffers and sensitive habitats. 				



- Refuelling and servicing to be conducted only at lined, contained facilities or off-site; prohibit these activities within water resource buffers.
- Equip all active work fronts and storage areas with spill kits appropriate to the types and volumes of hazardous substances present.
- Train all staff and contractors in spill prevention, response, and reporting procedures; conduct regular spill response drills.
- Inspect machinery and vehicles daily for leaks; repair leaks immediately or remove equipment from site for repair.
- Store hazardous materials on impermeable surfaces with secondary containment sized for 110% of the largest container.
- Develop and implement a Spill Response Plan, including clear roles, reporting lines, and disposal routes for contaminated materials.
- Collect and lawfully dispose of all contaminated soils, absorbents, and waste at licensed facilities.
- Monitor for evidence of leaks or contamination during and after rainfall events; maintain records of all incidents and responses.
- Conduct pressure testing of pipeline sections using clean water; collect and contain any test water for appropriate disposal.
- Maintain clean/dirty water separation at all times; direct dirty water to lined sumps or containment for treatment/disposal.
- Environmental Control Officer (ECO) to verify compliance with all mitigation measures and conduct regular audits.

10.3.5.6 ONGOING DISPLACEMENT AND DIRECT MORTALITIES OF FAUNAL COMMUNITY (INCLUDING SCC) DUE TO DISTURBANCE (ROAD COLLISIONS, NOISE, LIGHT, DUST, VIBRATION) (TE6) - OPERATION

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Ongoing displacement and direct mortalities of faunal community (including SCC) due to disturbance (road collisions, noise, light, dust, vibration) (TE6)	Operation	Medium to high -	Medium to low -	Medium to low -
Potential cumulative/confounding effects	<p>Localised cumulative impacts include those from operations that are close enough to potentially cause additive effects on the local environment or any sensitive receivers. Relevant activities and impacts include fragmentation, dust deposition and disruption of corridors or habitat.</p> <p>Long-term cumulative impacts associated with the site development activities can lead to the loss of endemic and threatened species, including natural habitat and vegetation types, and these impacts can even lead to the degradation of ecosystems and habitats.</p>			
Alternatives	<p>As a key embedded alternative (or alternative pre-contemplated which has subsequently affected the design of the pipeline), the pipeline is planned to traverse already-disturbed areas which minimises ecological impacts.</p>			



Mitigation Measures
<ul style="list-style-type: none"> • Stay within authorised footprint: Confine all activities to approved areas (preferably within Modified habitat). • Buffer integrity: Maintain and periodically re-mark no-go buffers around Water Resources and natural habitat edges; do not store materials or park within buffers. • Pre-activity checks: Before mowing, grading, or maintenance in vegetated edges, conduct brief visual checks; flush fauna where needed. • Safe relocation: Where wildlife is at risk, have a competent environmental officer or appointed specialist conduct safe relocation; record all interactions and relocations. • Maintain riparian movement corridors by keeping temporary works and stockpiles outside buffers; avoid fencing that blocks linear movement along riparian zones. • Prevent contamination and siltation through diligent pipeline maintenance and RWD integrity checks; respond immediately to leaks/overflows.

10.3.5.7 DESTRUCTION OF VEGETATION, ENCROACHMENT AND DISPLACEMENT OF THE NATURAL VEGETATION COMMUNITY AND DIRECT MORTALITY OF FAUNA (TE7) – DECOMMISSIONING

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Destruction of vegetation, encroachment and displacement of the natural vegetation community and direct mortality of fauna (TE7)	Decommissioning	Medium to high -	Medium to low -	Medium to low -
Potential cumulative/ confounding effects	<p>Localised cumulative impacts include those from operations that are close enough to potentially cause additive effects on the local environment or any sensitive receivers. Relevant activities and impacts include fragmentation, dust deposition and disruption of corridors or habitat.</p> <p>Long-term cumulative impacts associated with the site development activities can lead to the loss of endemic and threatened species, including natural habitat and vegetation types, and these impacts can even lead to the degradation of ecosystems and habitats.</p>			
Alternatives	<p>As a key embedded alternative (or alternative pre-contemplated which has subsequently affected the design of the pipeline), the pipeline is planned to traverse already-disturbed areas which minimises ecological impacts.</p>			
Mitigation Measures				
<ul style="list-style-type: none"> • Closure/Rehabilitation Plan: Implement the approved Closure and Rehabilitation Plan, with concurrent rehabilitation wherever feasible in the lead-up to decommissioning. Include detailed design for final slopes, drainage, soil amelioration, revegetation, AIP control, and monitoring criteria. 				



- Decommissioning footprint control: Demarcate no-go areas outside the authorised decommissioning footprint. Limit plant and personnel to designated work areas; no creation of new tracks in Degraded Secondary Grassland or Water Resource buffers.
- Soil replacement: Place suitable growth medium (clean salvaged topsoil or prepared cover soil) to specified depth. Keep separate from subsoil; avoid mixing to maintain fertility and seedbank viability.
- Drainage reconfiguration: Separate clean and dirty water; ensure post-closure drainage diverts clean runoff around rehabilitated surfaces and attenuates flows before discharge. Prevent concentrated flows into Water Resources and onto newly vegetated faces.
- Pre-works fauna sweeps: Conduct walk-throughs to flush fauna before clearing or grading. Any fauna at risk must be safely removed by a competent environmental officer/specialist; record relocations.
- Traffic controls: Enforce low speeds (max 40 km/h; 20 km/h at night if applicable) on decommissioning routes; restrict night operations where practicable.
- Zero persecution policy: Prohibit hunting, trapping, or collection of fauna; remove snares and report incidents.
- Hazardous substances: Store, handle, and dispose of fuels, oils, and chemicals per legal requirements. Maintain spill kits; clean any spills immediately; prevent contamination of Water Resources and rehabilitated soils.
- Waste management: Remove obsolete infrastructure, rubble, and litter. Manage waste via the Solid Waste Management Plan; no burial of waste on site unless authorised.
- Erosion control: Install appropriate measures (e.g., mulch/brush-packing, erosion blankets, contour wattles, rock rip-rap) on re-profiled slopes and drainage outlets. Rectify any rilling/gullies immediately.
- Dust suppression: Wet haul roads and disturbed soils using non-potable “dirty water” where appropriate; avoid runoff into wetland/riparian buffers; enforce speed limits and signage.
- Species palette: Re-vegetate with locally appropriate indigenous grasses (and forbs where feasible), prioritising species typical of local Grassland habitat types for grassland-facing slopes, and indigenous wetland edge species near Water Resource buffers where appropriate to stabilise banks (without impeding water management).
- Topsoil and brush: Use clean salvaged topsoil and brush-packing (indigenous trimmings) to provide microsites, reduce wind erosion, and suppress AIPs.
- Grazing exclusion: Prohibit grazing until vegetation meets success criteria; implement temporary fencing where necessary to allow establishment.
- AIP Management Plan: Continue and intensify AIP control during and after decommissioning. Prioritise Water Resource buffers, rehabilitated slopes, and edges of Degraded Secondary Grassland.
- Follow-up regime: Treat regrowth before seed set; schedule multiple follow-ups (e.g., months 3, 9, 18 post-planting) and then annually, with heightened effort after good rains.
- Monitoring frequency: Conduct quarterly monitoring for three years post-decommissioning, recording vegetation cover, species composition, AIP incidence, erosion status, and fauna use (observations/track signs).
- Success criteria: Define quantitative targets (e.g., $\geq 70\%$ vegetative cover on rehabilitated slopes within 18 months; AIP cover $< 5\%$ after 24 months; stable slopes with no active gully erosion; intact buffers with no sediment plumes).



- Adaptive actions: If targets are not met, implement corrective measures (additional soil amelioration, reseeded, erosion control, intensified AIP follow-up).
- Natural topography: Shape the area to blend with surrounding landform where safely achievable and consistent with post-closure stability requirements.
- Awareness training: Induct decommissioning teams on fauna protection, buffer rules, spill response, AIP control, and rehabilitation protocols; keep signed attendance registers.
- Responsibilities: Contractor implements; Environmental Control Officer and rehabilitation specialist audit and verify; botanist/ecologist provides oversight on species selection and monitoring.
- Documentation: Keep records of soil volumes and placement, seed/plant sources, AIP treatments, incidents, monitoring data, and corrective actions.
- Rectify all erosion problems as soon as observed using appropriate control structures and re-vegetation techniques; update drainage/erosion controls if repeat issues occur.

10.3.6 SOCIAL (S)

While the overall socio-economic impact of the project could be considered together, these have been considered here independently. Overall, positive impacts are expected as a result of the implementation of the project. These mainly relate to further development of the community through industry growth (S1) and potential job creation (S2), which is expected to be an indirect impact of the implementation of the project. The installation of this pipeline is expected to strengthen the capacity and capability of Harmony's Free State operations, which will in turn, have positive repercussions. Impacts here contemplated and identified are rated between Low to high positive.

10.3.6.1 FURTHER DEVELOPMENT OF COMMUNITY THROUGH INDUSTRY GROWTH (S1) – OPERATION

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Further development of community through industry growth (S1)	Operation	Medium to high +	Medium to high +	Medium to high +
Alternatives	The alternative here contemplated is the “no-go” alternative. The impacts presented here would be negated should this project not be implemented.			
Enhancement Measures				
<ul style="list-style-type: none"> • Promote participation of local SMMEs in providing minor services where applicable 				

10.3.6.2 POTENTIAL FUTURE JOB CREATION (S2) – OPERATION

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Potential future job creation (S2)	Operation	Low +	Low +	Low +
Alternatives	The alternative here contemplated is the “no-go” alternative. The impacts presented here would be negated should this project not be implemented.			
Enhancement Measures				



- Prioritise the use of local labour for any short-term construction tasks where applicable.
- Provide short on-site skills exposure (e.g. pipeline assembly observation, safety protocols orientation) to increase transferable skills.

10.3.7 CULTURAL HERITAGE (C)

A single impact in terms of Archaeological, and a single impact related to palaeontology were identified. In terms of Archaeology, it is possible that cultural material will be exposed during construction and may be recoverable, keeping in mind that delays can be costly during construction, and as such must be minimised (C1). Development surrounding infrastructure and construction of facilities results in significant disturbance; however, foundation holes do offer a window into the past, and it may thus be possible to rescue some of the data and materials. It is also possible that substantial alterations will be implemented during this phase of the project, and these must be catered for. It is important to note that through the implementation of the proposed mitigation, this project may have a positive impact on heritage, as it presents opportunity to identify unidentified archaeological finds and sites.

The construction phase will be the only development phase with the potential of impacting Palaeontological Heritage, as listed below in terms of fossil heritage (C2).

10.3.7.1 DAMAGE/DESTRUCTION TO UNKNOWN ARCHAEOLOGICAL AND HERITAGE MATERIAL (C1) - CONSTRUCTION

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Damage/destruction to unknown archaeological and heritage material (C1)	Construction	Low -	Low +	Low +
Potential cumulative/confounding effects	The cumulative impacts of the preferred method of mitigation is rated as low, which means considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.			
Alternatives	No alternatives were considered in respect to heritage impacts.			
Mitigation Measures				
<ul style="list-style-type: none"> • As a recommendation to address potential unknown and unidentified archaeological finds, a chance find procedure must be implemented. This would potentially involve the following steps: <ul style="list-style-type: none"> ○ A heritage practitioner/archaeologist should be appointed to develop a heritage induction program and conduct training for the Environmental Control Officer (ECO) as well as team leaders in the identification of heritage resources and artefacts during the implementation of the Environmental Management Program (EMPr). ○ An appropriately qualified heritage practitioner/archaeologist must be identified to be called upon in the event that any possible heritage resources or artefacts are identified. ○ Should an archaeological site or cultural material be discovered during construction (or operation), the area should be demarcated, and construction activities halted. ○ The qualified heritage practitioner/archaeologist will then need to come out to the site and evaluate the extent and importance of the heritage resources and make the necessary recommendations for mitigating the find and the impact on the heritage resource. ○ The contractor therefore should have a contingency plan so that operations could move elsewhere temporarily while the materials and data are recovered. 				



- Construction can commence as soon as the site has been cleared and signed off by the heritage practitioner/archaeologist.
- The Chance find procedure will involve the following depending on the type of Archaeological or heritage finds and sites:
 - **Burial grounds and graves:** Demarcate a 30 m buffer during construction and treat as no-go zones. Should a fence be erected, access to the BGG for interested and affected parties and next-of-kin must be allowed, and suitable measures for public access control must be put in place. An access protocol to manage visits by the next of kin must be included in the EMP. If direct impact is unavoidable and relocation is required, a grave relocation process (NHRA section 36) must be undertaken. This involves social consultation, public participation, and permits from SAHRA under the NHRA and the National Health Act (Act 61 of 2003) (NHA), as amended.
 - **Historical homesteads/structures:** Demarcate a 30 m buffer during construction and treat as no-go zones for sites graded as IIIC or higher. If conservation is not possible, mitigation must be undertaken under a NHRA section 34 permit from SAHRA, as well as a section 36 permit in the case of homesteads which hold the chance of containing graves. For mitigation of these sites, documentation by an architectural historian, which consists of drawing and photographing the structure and the layout, as well as recording any special characteristics identified during the recording, after which a destruction permit can be applied for, as discussed in the bullet point below. This includes detailed documentation of the site layout and infrastructural characteristics, and archaeological geophysics and test excavations to investigate the possibility of infant burials for the homesteads which are assessed to hold the potential for graves, which will require a NHRA section 35 permit from SAHRA. Destruction may proceed only on condition of the issuing of an appropriate permit from the relevant PHRA/SAHRA, which is supported by the mitigation report, or if the cultural heritage resource is to be retained in situ and not altered; an HMP in compliance with section 47(3) of the NHRA must be compiled by a heritage specialist/archaeologist and implemented.
 - **Archaeological sites:** Demarcate a 30 m buffer during construction and treat as no-go zones for sites graded as IIIC or higher. As the 30 m buffer is a guideline, it may be reduced only if the site is clearly demarcated, strictly avoided, and such a reduction is approved by SAHRA. If conservation is not possible, mitigation must be undertaken under a NHRA section 35 permit from SAHRA. This includes a sample surface collection for all types of archaeological material in the impacted areas.

10.3.7.2 PALAEOLOGY: LOSS OF FOSSIL HERITAGE (C2) - CONSTRUCTION

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Palaeontology: Loss of Fossil Heritage (C2)	Operation	Medium to high -	Low -	Low -
Potential cumulative/confounding effects	The cumulative impacts of the development are considered to be Low (as the area is not highly fossiliferous), and falls within the acceptable limits for the project. It is therefore considered that the study Project will not lead to damaging impacts on the palaeontological resources of the area.			
Alternatives	No alternatives were considered in respect to heritage impacts.			
Mitigation Measures				



Implementation of a Chance Find Procedure as follows:

- When a chance find is made the person must instantly stop all work near the find.
- The site must be secured to protect it from any additional damage
- The finder of the fossil heritage must immediately report the find to his/her direct supervisor, according to the reporting protocols instituted by the development management. The supervisor must in turn report the find to his/her manager and the EO. The EO must report the find to the relevant Authorities and a relevant palaeontologist.
- The developer/contractor must appoint a relevant palaeontologist to investigate and access the chance find and site.
- The palaeontologist must ensure that accurate records and documentation are kept. The documentation must start with the initial chance find report, including records of all actions taken, persons involved and contacted, comments received and findings.
- These documents will be necessary to request authorizations and permits from the relevant Authorities to continue with the work on site
- The reports and all other documents will be submitted to SAHRA by the palaeontologist.
- The report will include recommendations for additional specialist work if necessary, or request approval to continue with the development.
- When the necessary approvals have been issued, the development may carry on with the development.
- The EO will close off the Chance Find Procedure and would be required to implement any requirements issued by the Authority and to add it to the operational management plan

10.3.8 ECONOMIC (E)

As discussed in previous sections, this project is expected to have knock-on economic impacts through the sustaining and supporting of mining activities in the Free State (E1) which will take place during and following operation. A Medium to High positive impact on the economy is expected.

Impact	Phase	Pre-mitigation Impact	Post-mitigation Impact	Final Significance
Economic growth through the sustaining and support of Free State mining activities (E1)	Operation	Medium to high +	Medium to high +	Medium to high +
Alternatives	The alternative here contemplated is the “no-go” alternative. The impacts presented here would be negated should this project not be implemented.			
Enhancement Measures				
<ul style="list-style-type: none"> • Promote local procurement for operational support services tied to pipeline inspections, vegetation management, and minor maintenance tasks (where applicable). • Ensure operational reliability of the pipeline through proactive maintenance, reducing the risk of water shortages that could disrupt production and indirectly affect local economies. 				



11 CONCLUSIONS AND RECOMMENDATIONS

The BA process identified potential issues and impacts associated with the proposed project. The BA addresses those identified potential environmental impacts and benefits (direct, indirect and cumulative impacts) associated with applicable phases and activities of the project and recommends appropriate mitigation measures for potentially significant environmental impacts. The BA report provides sufficient information regarding the potential impacts and the acceptability of these impacts in order for the Competent Authority to make an informed decision regarding the proposed project. The release of a draft BA Report for public review and comment provides stakeholders with an opportunity to verify that the issues they have raised throughout the process to date has been captured and adequately considered. All issues raised throughout the public participation process have been captured and responded to as far as possible.

The BA report aims to achieve the following:

- Provide an overall assessment of the social and biophysical environments affected by the proposed project.
- Assess potentially significant impacts (direct, indirect and cumulative, where required) associated with the proposed project.
- Identify and recommend appropriate mitigation measures for potentially significant environmental impacts; and
- Undertake a fully inclusive public involvement process to ensure that I&APs are afforded the opportunity to participate, and that their issues and concerns are recorded.

11.1 CONCLUSIONS FROM SPECIALIST STUDIES

The conclusions and recommendations of this BA are the result of the assessment of identified impacts by specialists where applicable, and the parallel process of public participation. The main conclusions from each of the specialist studies are presented below.

11.1.1 TERRESTRIAL ECOLOGY

It is the opinion of the specialist that it is unlikely that any significant functional habitat or SCCs will be lost as a result of the proposed pipeline, due to the location, state, and size of the project area and the remaining habitats. These assumptions pertain to the terrestrial habitat within the project area only, and the recommendations and mitigations presented in this and any accompanying assessments must be strictly adhered to.

11.1.2 WETLANDS AND AQUATICS

A risk assessment was conducted for the proposed pipeline development. The risks to freshwater features fall within the “Low” significance category, provided that the prescribed mitigation and management measures are fully implemented.

11.1.3 HYDROPEDOLOGY

It is the specialist’s opinion that the proposed St. Helena 123&4 pipeline upgrade project and associated infrastructure will not result in a significant loss of total streamflow and groundwater recharge water regime stores. It is therefore recommended that the proposed activities proceed as planned and no further hydrogeology assessments are necessary.

11.1.4 HYDROLOGY

The proposed addition of the St. Helena 123&4 upgrade project can be authorised with regard to the hydrological (surface water) environment, inclusive of the recommended mitigation measures presented in the specialist report (APPENDIX E)



The project benefits from the near-concurrent (or perhaps concurrent) development of the FSN1 pipeline that would enable impacts not be duplicated or at least lessened through the development of a shared access road (for example).

11.1.5 HERITAGE

It is the combined considered opinion of the heritage specialists that the proposed project will have no direct impact on any known cultural heritage resources. With the implementation of recommended mitigation measures in case of a chance find, the overall impact on heritage resources will be reduced to acceptable levels during the activities of the project.

11.1.6 PALAEOLOGY

The St Helena 123 TSF Return Water Pipeline between the RWD (Return Water Dam) and Dam 13 in the Free State Province is underlain by the Quaternary superficial aeolian sand. The PalaeoMap of SAHRIS (South African Heritage Resources Information System) indicates the Palaeontological Sensitivity of the Quaternary superficial deposits is Moderate, (Almond et al. (2013); SAHRIS website). The Palaeontological Sensitivity generated by the DFFE National Environmental Web-Based Screening (Department of Forestry, Fisheries and the Environment) indicates that the that the study area has a Medium Palaeontological Sensitivity. Due to the Palaeontological Sensitivities (SAHRA and DFFE) no site investigation was undertaken for this study

A Medium Palaeontological Significance has been allocated for impacts associated with the construction phase of the development pre-mitigation and Low post-mitigation. The construction phase will be the only development phase with the potential of impacting Palaeontological Heritage, and no significant impacts are expected to impact the Operational and Decommissioning phase.

11.2 SENSITIVITY MAP

Environmental sensitivity mapping provides a strategic overview of the environmental, cultural and social assets in a region. The sensitivity mapping technique integrates numerous datasets (base maps and shapefiles) into a single consolidated layer making use of Geographic Information System (GIS) software and analysis tools. Environmental sensitivity mapping is a rapid and objective method applied to identify areas which may be particularly sensitive to development based on environmental, cultural and social sensitivity weightings – which is refined by specialists' input within each respective specialist field based on aerial or ground-surveys. Therefore, the sensitivity mapping exercise assists in the identification of sensitive areas within and surrounding the proposed application area

Figure 11 superimposes the proposed activity and its associated structures and infrastructure on the combined environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers.

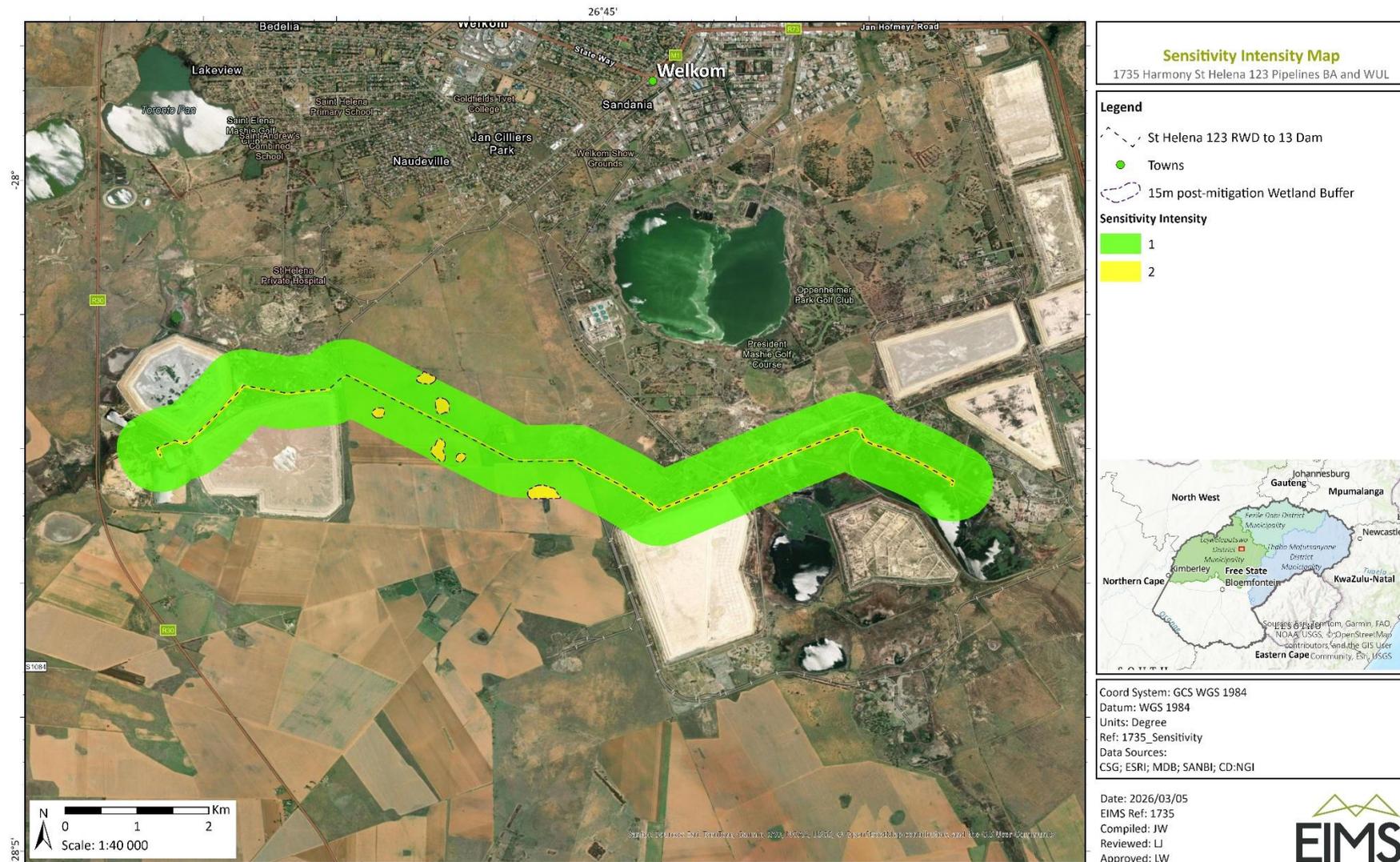


Figure 11: Composite sensitivity map.



11.3 ENVIRONMENTAL IMPACT STATEMENT

The findings of the assessment and associated specialist studies conclude that there are no environmental fatal flaws that should prevent the proposed project from proceeding, provided that the recommended mitigation and management measures are implemented. Based on the nature and extent of the proposed project, the local level of disturbance predicted as a result of the proposed activities, the findings of the specialist studies, and the understanding of the significance level of potential environmental impacts, it is the opinion of the BA project team and the EAP that the significance levels of the majority of identified negative impacts can generally be reduced to an acceptable level by implementing the recommended mitigation measures and the project should be authorized.

The following impacts were determined to have a potentially moderate negative final significance after mitigation:

- Terrestrial Ecology:
 - Destruction, further loss and fragmentation of the of habitats, ecosystems and vegetation community.
 - Introduction of alien and invasive species, especially plants.
 - Displacement of faunal community due to habitat loss, direct mortalities and disturbance (road collisions, noise, dust, vibration and poaching).
 - Continued fragmentation and degradation of habitats and ecosystems.
 - Potential leaks, discharges, pollutants from pipeline and machinery/storage leaching into the surrounding environment.
 - Ongoing displacement and direct mortalities of faunal community (including SCC) due to disturbance (road collisions, noise, light, dust, vibration).
 - Destruction of vegetation, encroachment and displacement of the natural vegetation community and direct mortality of fauna.

11.4 RECOMMENDATIONS FOR INCLUSION IN ENVIRONMENTAL AUTHORIZATION

This section contains recommendations from the EAP and various specialist's for inclusion in the EA.

11.4.1 EAP

In addition to the standard conditions of an integrated Environmental Authorisation, the following specific conditions must be included in the EA. This section will be expanded upon to include any additional conditions identified during the BAR comment period:

- All mitigation measures included in the Basic Assessment Report, EMPr and associated specialist studies must be adhered to.
- A suitably qualified Environmental Control Officer (ECO) must be appointed for the proposed project to monitor compliance with the conditions of the Environmental Authorisation and EMPr. The Applicant shall provide the ECO with the necessary support to ensure that the environmental aspects relating to the development is adhered to. The ECO must monitor all construction activities and ensure the demarcation of all applicable areas and approve the locations of all infrastructure prior to construction.
- The Contractor shall inform all adjacent landowners of the commencement of construction activities at least 30 days prior to commencement of construction.
- Rehabilitation of the disturbed areas must be made a priority, especially wetlands.



11.4.2 PALAEOLOGY

In the unlikely event that, Palaeontological Heritage is uncovered during surface clearing and mining excavations, the ECO/site manager must report the find to the South African Heritage Resources Agency (SAHRA) (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that mitigation (recording and collection) can be carried out.

Before any fossil material can be collected from the development site, the specialist involved would need to apply for a collection permit from SAHRA. Fossil material must be housed in an official collection (museum or university), while all reports and fieldwork should meet the minimum standards for palaeontological impact studies proposed by SAHRA (2012).

11.4.3 SURFACE WATER/WETLANDS

At the single point where the proposed pipeline servitude intersects the mapped low-sensitivity drainage feature, it is advisable that the crossing be designed so that the above-ground pipeline spans the active channel and does not obstruct low or high flows. No wholesale infilling, diversion or culverting of the drainage line should occur; any localised excavation or plinth foundations should be positioned outside the active channel and protected against erosion, with disturbed banks and approaches stabilised and re-vegetated immediately after construction. The crossing should, as far as practicable, make use of the existing disturbed access corridor rather than creating a new disturbance footprint. With these measures in place and given the already modified condition and low ecological sensitivity of the drainage feature, residual post-mitigation risks at the drainage-line crossing are considered to be low.

12 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations relating to this assessment should be considered in evaluating and decision-making on this assessment:

- Unless specifically noted, the environmental attributes for the receiving environment have been obtained from best available spatial and scientific data sources. Whilst reasonable effort has been taken to obtain the most recent and relevant data, there may be gaps in baseline data, leading to uncertainties in impact predictions. Where uncertainty exists efforts are made to indicate this in the assessment.
- This study is based on activity information provided by the applicant (including engineering designs, specifications, services reports, etc). The accuracy of this information has not been verified, and it is assumed that no significant changes or deviations to the final designs will occur. Should such occur the significance of the potential impacts may require reassessment and where relevant formal amendment processes.
- The information presented in this report is based on the information available at the time of compilation of the report.
- Whilst reasonable effort has been made to identify all potential environmental impacts, some impacts may not be reasonably foreseeable or may emerge only after project implementation.
- In determining the significance of impacts, with mitigation, it is assumed that mitigation measures proposed in the report are correctly and effectively implemented and managed throughout the life of the project.

The remaining sub-sections present the assumptions and limitations applicable to the respective specialist assessments.

12.1 TERRESTRIAL ECOLOGY

The following aspects were considered as limitations:



- All datasets accessed and utilised for this assessment are considered to be representative of the most recent and suitable data for the intended purposes;
- The area was surveyed during a single site visit on the 8th of December 2025, which constitutes a wet season survey. The assessment does not consider temporal trends. Please note, this assessment is regarded as sufficient for the purposes of this report;
- Whilst every effort was made to cover as much of the project area as possible, representative sampling was completed, and by its nature it is possible that some plant and animal species that are present within the project area were not recorded during the field investigations;
- This assessment was conducted from a terrestrial perspective only and must be considered in conjunction with the accompanying specialist reports;
- The Global Positioning System (GPS) used in the assessment has an accuracy of 5 m and consequently any spatial features may be offset by up to 5 m.

12.2 WETLANDS AND AQUATICS

The following aspects were considered as limitations:

- Where inaccessible, freshwater features within the larger 500 m project area were delineated and assessed via desktop;
- Areas characterised by external wetland attributes were the focus of this assessment, where wetlands were thereafter confirmed by soil form indicators;
- Only natural features were considered for the ecological components of this assessment; and
- The GPS used for water resource delineations is accurate to within five metres. Therefore, the wetland delineation plotted digitally may be offset by a maximum of five metres to either side

12.3 HERITAGE

12.3.1 ASSUMPTIONS

- Unchanged Site Conditions: It is assumed that the physical condition of the site has not materially changed since both Google and ESRI satellite imagery were captured.
- Historical Map Accuracy: It is assumed that the initial historical mapping (and subsequent cartography) is accurate of all known and surveyed markers at that time.

12.3.2 LIMITATIONS

- No Physical Site Inspection: No site visit was undertaken; therefore, the assessment could not confirm existing conditions, ground truthing, or to verify features on-site.
- No Archaeological Investigation: Sub-surface or concealed heritage resources could not be evaluated due to the lack of intrusive testing or ground inspection.
- Environmental and Contextual Factors: The surrounding landscape, setting, and potential visual or spatial relationships could not be fully assessed without a field survey.
- Temporal Limitations: The statement reflects the physical condition of the site at which both Google and ESRI satellite imagery were captured.

Therefore, should any heritage features and/or objects be located or observed outside or within the identified heritage sensitive areas during construction activities, a heritage specialist must be contacted immediately. Such observed or located heritage features and/or objects may not be disturbed or removed in any way until such



time as the heritage specialist has been able to make an assessment of the significance of the site (or material) in question. This also applies to Burial Grounds and Graves (BGG). If any BGG are located or observed during the course of the development, the procedures and requirements pertaining to BGG will apply as set out below.

13 AFFIRMATION REGARDING CORRECTNESS OF INFORMATION

I John von Mayer declare that:

General declaration:

- I act as the independent environmental practitioner in this application
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I will take into account, to the extent possible, the matters listed in regulation 8 of the regulations when preparing the application and any report relating to the application;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- I will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report;
- I will keep a register of all interested and affected parties that participated in a public participation process; and I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not all the particulars furnished by me in this form are true and correct;
- I will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Disclosure of Vested Interest (delete whichever is not applicable)



I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2014.

Signature of the EAP

Environmental Impact Management Services (Pty) Ltd

Name of company:

2026/03/17

Date:



I Lucien James declare that:

General declaration:

- I act as the independent environmental practitioner in this application
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I will take into account, to the extent possible, the matters listed in regulation 8 of the regulations when preparing the application and any report relating to the application;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- I will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report;
- I will keep a register of all interested and affected parties that participated in a public participation process; and I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not all the particulars furnished by me in this form are true and correct;
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Signature of the EAP

Environmental Impact Management Services (Pty) Ltd

Name of company:

2026/03/17

Date:



14 REFERENCES

- Almond, J., Pether, J., Groenewald, G., 2013. South African National Fossil Sensitivity Map. SAHRA Council.
- Le Maitre, D., Seyler, H., Holland, M., Smith-Adao, L., Nel, J., Maherry, A., Witthüser, K., 2018. Identification, delineation and importance of the strategic water source areas of South Africa, Lesotho and Swaziland for surface water and groundwater. Report No. TT 743/1/18, Water Research Commission, Pretoria.
- Mucina, L., Rutherford, M., 2006. The vegetation of South Africa, Lesotho and Swaziland. *Strelitzia* 19., (South African National Biodiversity Institute: Pretoria, South Africa). *Mem. Bot. Surv. South Afr.*
- StatsSA, 2022. 2022 Census Data. URL <https://census.statssa.gov.za/>

Note: Separate specialist reports include additional references. Refer to APPENDIX E for full specialist reports.



15 APPENDICES



APPENDIX A: EAP CV



APPENDIX B: SCREENING TOOL REPORT AND SSVR



APPENDIX C: APPLICATION FORM



APPENDIX D: PUBLIC PARTICIPATION



APPENDIX E: SPECIALIST REPORTS



APPENDIX F: IMPACT ASSESSMENT MATRIX



APPENDIX G: ENVIRONMENTAL MANAGEMENT PROGRAMME



APPENDIX H: REHABILITATION, DECOMMISSIONING AND CLOSURE PLAN



APPENDIX I: ADDITIONAL INFORMATION